



# **Comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg**

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Occupational Therapy.

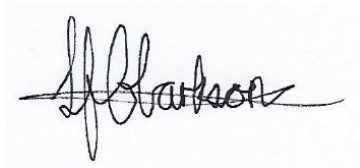
Human Research Ethics Committee (Medical) Clearance Certificate number:  
M200956

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Johannesburg, October 2024

## DECLARATION

I, Lara Clarkson, declare that this Research Report is my own, unaided work. It is being submitted for the Master of Science in Occupational Therapy degree at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

A handwritten signature in black ink, appearing to read 'Lara Clarkson', is written over a light blue rectangular background.

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Signature of candidate  
17<sup>th</sup> day of October 2024 in Johannesburg

## PLAGIARISM

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## ABSTRACT

**Introduction:** Play spaces facilitate play as a child's primary occupation which is essential for learning and early child development. In South African early childhood development centres, almost 11% do not have access to outdoor play areas, 20% have no outdoor play equipment, and 50% have no access to educational toys (Statistics South Africa, 2016).

**Objectives:** This research aimed to determine the physical design and availability of outdoor play spaces in low socioeconomic and high socioeconomic early childhood development centres in Johannesburg and make comparisons between the outdoor play space physical design and availability of these two control groups.

**Methods:** A descriptive comparative research design was used, with a total population sampling method for the distribution of a self-developed research questionnaire adapted from play literature. Results were obtained from a total sample size of 82 early childhood development centres, 28 reported low socioeconomic and 54 reported high socioeconomic. Quantitative data was analysed using descriptive and inferential statistics. Qualitative data was analysed as a supplement using content analysis and photographic evidence.

**Results:** Low socioeconomic early childhood development centres, 57% community-based sites, had significantly less funding frequency compared to high socioeconomic early childhood development centres, 83% independent / private schools, with 87% private funding at least annually for outdoor play space upkeep. Overall, low socioeconomic early childhood development centres had limited outdoor play space resource variety and quantity (7% had no outdoor play space, 43% had traditional playground designs, 14% had no fixed playground structures), compared to high socioeconomic early childhood development centres which had a wide variety and abundance of outdoor play space resources with 30% traditional and 33% creative playground designs. Chi-squared statistics revealed a significantly greater number of fixed manufactured equipment, loose manufactured materials, loose movement toys, fixed natural resources, loose natural resources, and multi-sensory exploration spaces in high socioeconomic early childhood development centres. Cramer's V statistics revealed outdoor play space physical design and availability have a strong dependence on socioeconomic status.

## **DEDICATION**

This research report is dedicated to the children of Johannesburg in need of better access and opportunities to natural, cost-effective, safe, and developmentally appropriate outdoor play spaces to play, explore the world and, ultimately, learn and develop. The information gained from this study aims to make recommendations to aid in bridging the gap between wealth and poverty in something as unassuming and practical as outdoor play spaces in early childhood development centres.

## **ACKNOWLEDGEMENTS**

To all the teachers and principals who made sure I got to your ECD centres all around Johannesburg safely, welcomed me in with kindness and generosity, introduced me to all your wonderful children and colleagues, gave me tours around your centre and some of the community, showed me every resource or piece of equipment you had available, and spent hours talking to me about your outdoor play spaces, I would like to say a very special thank you for your time, patience, and care, as well as the commitment, dedication and heartfelt love that you give to your children. I was blessed to share and speak with you about the importance of outdoor play for child development, as well as to learn from the creative and cost-effective means in which you are already implementing these principles with what is available to you. I hope that this research report can make even a small difference in motivating for further funding and training for those under-resourced ECD centre outdoor play spaces I had the privilege of visiting. Thank you too to all those with whom I spoke to over the phone, or who shared my research or contact details on social media platforms and other ECD colleagues, to further my research reach. Thank you to the stakeholders, as part of the FNB ECD and HELP SA ECDs organisations, for helping me reach further teachers and for inspiring me with the incredible work that you are doing for improving training and opportunities in ECD centres around South Africa.

The completion of this research report would not have been possible without the constant and unconditional love and support from my Mom, my sister, my boyfriend, and my special dogs Bailey and Salsa. I would especially like to thank my Mom for inspiring me to sign up for a Master's degree in the first place, always believing in my abilities even when I did not, supporting me emotionally and financially through the COVID-19 pandemic and all the other life obstacles over the last few years, and being a consistent voice of strength and reason to never give up. I could not have gone without my sister and best friend, Andi, for constantly inspiring positive work habits and work ethic in me, being a role model for me despite being my younger sister, helping me with Excel and all the many hours of statistics support even through all her own exams, and all the long emotional support chats and happy moments after losing Dad, Granny, Zahn, Salsa, and Mom fighting her way through cancer. I am also grateful beyond words to my boyfriend Christopher for everything in between, for becoming an "OT without a degree" after listening to me carry on about my coursework, research and work experiences, for supporting me through some of the

most difficult years of my life, for being another role model for me in completing your own Master's degree and constantly inspiring me to get closer to walking across the graduation stage, and for always making sure I eat and exercise well in between. Thank you to my previous Capable Kids OT colleagues and friends who always supported me and believed in me throughout this degree and engaged in countless professional discussions and debates about my learnings. Thank you to my Ariel colleagues and friends who inspired me to take steps towards better understanding myself, improving my work-life balance, improving my self-care and self-kindness, and reminding me that family and friends are always most important.

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# LIST OF ACRONYMS

**AOTA:** American Occupational Therapy Association

**ECD:** Early Childhood Development

**HSE:** High socioeconomic

**IPA:** International Play Association

**LSE:** Low socioeconomic

**OHCHR:** Office of the United Nations High Commissioner for Human Rights

**SES:** Socioeconomic status

**UN:** United Nations

**UNCRC:** United Nations Convention of the Rights of the Child

**WHO:** World Health Organization

## OPERATIONAL DEFINITIONS

Context: This term, in this research report, is used to describe all personal and environmental factors that characterise and surround the outdoor play space of the Early Childhood Developmental (ECD) centre. Environmental factors are components of the physical, social, and attitudinal surroundings which can include both natural and human-made aspects, including physical geography, population, flora, fauna, climate, natural events, human-caused events, light, time-related changes, air quality, products, technology, equipment, curriculum, political or cultural factors, support and relationships, social norms and beliefs, services, systems, and policies. Personal factors describe the unique characteristics of a person or group of people, such as those of the children and teachers attending the ECD centre in this study, including age, gender, race, socioeconomic status, level of education, lifestyle factors and personal character traits. (American Occupational Therapy Association [AOTA], 2020)

Outdoor play space: this is the area of the outdoor environment where there is free-flowing air that is designated and designed for the occupation of play to take place. These spaces provide opportunities for play engagement with the natural and/or manufactured physical aspects of the environment (Outdoor Play Canada, 2019).

Physical design of outdoor play space: The physical design includes all physical natural and manufactured elements in an outdoor play space including infrastructure, playground equipment, facilities, toys, and resources that are equipped for harnessing outdoor play. Physical designs may incorporate a type of playground, be part of a playscape (landscape designed specifically for play), and loose parts. The physical design may vary extensively based on differences in variables such as size, shape, height, cost, accessibility, type of materials used, terrain, amount of space, safety and security, universal design, sensorimotor components, and usability. These may have a wide variety of elements including various sensorimotor aspects, terrain, type of materials used, physical security boundaries, amount of space, safety, and physical accessibility and usability. These designs may or may not have been designed by skilled practitioners working in the field of play or education, who considered the definition of play, the context of the play, the value of play and other contextual factors including developmental, cultural, and social factors (Outdoor Play Canada, 2019).

Play: The occupation of play is a complex, multidimensional, socially and culturally dependent construct that encompasses all activities, behaviours, and subjective experiences that are intrinsically motivated, internally controlled, freely chosen, and may include aspects of suspension of reality, fun, meaning, play exploration, mischievous, risks, construction, pretend, practice, rules, symbolism, creativity, autonomy, and challenge (American Occupational Therapy Association, 2020). Core attributes of play participation include taking part, feeling included, and having the choice to achieve the play process (Lynch and Moore, 2016).

# CHAPTER 1: INTRODUCTION, LITERATURE REVIEW, AND METHODOLOGY

## 1.1 INTRODUCTION

### 1.1.1 Introduction to the problem

All children have the right to play according to Article 31 of the United Nations Convention of the Rights of the Child (United Nations Human Rights Office of the High Commissioner, 1990). All children have the right to time, space, and freedom to play (International Play Association [IPA], 2014). Play is considered a vital primary occupation for children and a fundamental aspect of childhood (Parham, 2008; UNCRC, 2013). The International Play Association (IPA) have reinforced the importance of play to allow children to be children, in addition to its broadly researched and evidence-based position that play in all its forms is fundamental for early childhood development, including, but not limited to biological, social, cognitive, emotional, sensory, and physical development, as well as general health and well-being of the child (IPA, 2014; UNCRC, 2013).

The provision of a safe and healthy physical school environment in a health-promoting school, as defined by the World Health Organization (WHO), consists of ensuring that all schools have a safe space for play (World Health Organization [WHO], 2018). However, schools and Early Childhood Development (ECD) centres should have more than just safe and healthy spaces for play. Their play spaces should be fun, inviting, developmentally appropriate, accessible, usable, and safe with sufficient resources and physical space to allow children to engage in play that supports all characteristics of play, including fun, self-chosen, pleasurable, and child-driven play (IPA, 2014). There is a significant lack of research literature in South Africa on the physical design and availability of equipment within outdoor play spaces in ECD centres, in both low socioeconomic (LSE) and high socioeconomic (HSE) environments. Without this knowledge, it will be difficult to achieve effective and appropriate outdoor play space design and quality on a large community scale.

Play cannot occur without place and context. Play looks very different in different places and contexts, which are socially formed by cultures, communities, and societies. The context in which play occurs is highlighted in all definitions of play in the literature, and

the subjective meaning that play takes on in different contexts significantly impacts the definitions of play (Parham, 2008).

The true characteristics of play are supported by the provision of time, space, and freedom to play, which ultimately promotes all aspects of early development of a child (IPA, 2016). It is essential to understand the contextual factors that impact a child's opportunities to have time, space, and freedom to play. Understanding contextual factors would help to protect, preserve and promote a child's right to play. Is there time, space, and freedom available for children's play? Is this time, space, and freedom for play truly meeting all the natural characteristics of true childhood play? Is this time, space, and freedom for play positively or negatively impacted by contextual affordances or constraints, and what are these affordances or constraints? Once the time, space, and freedom for play are truly understood, one can better determine the quality of the play itself and the resultant impact on a child's development. The research therefore aims to explore an aspect of these contextual factors that have a transactional relationship with the occupation of play, namely the space available for play. This research will explore the contextual affordances and constraints of the physical design and availability of, more specifically, the outdoor play space/s in Johannesburg ECD centres.

Access and opportunity to outdoor play space, equipment, and resources for children aged 0-6 years to promote play as an occupation for children is a major concern in South Africa's currently inequitable society. Socioeconomic status plays a major role in determining the current access and opportunities children have for play. Statistics South Africa (2024) released the census 2022 results within their most recent publication: "A profile of education enrolment, attainment, and progression in South Africa". Statistics South Africa (2024) emphasised ECD as a foundational educational framework, committed to the implementation of the National Integrated ECD 2015 policy aimed at universal access for children from birth until formal schooling years to high-quality ECD services, reinforced the incorporation of the grade R year into the foundation primary education phase, and outlined the 2022 shift in ECD program provision from the Department of Social Development to the Department of Basic Education (Statistics South Africa, 2024a). Using subjective poverty indicators, the General Household Survey revealed that the proportion of households in the city of Johannesburg who perceived themselves as poor increased from 18.1% in 2019 to 21.9% in 2022, but that the proportion of households that were identified as poor in Johannesburg on the minimum household income question decreased from 64.7% in 2019 to 60.6% in 2022 (Statistics

South Africa, 2024b). 66.4% of children in Gauteng aged 0-4 years old were found to be attending ECD centres in 2022 with a higher participation rate for children aged 3-4 years old (Statistics South Africa, 2024a). The General Household Survey in 2016 revealed that there were close to 7,2 million children aged 0-6 years in South Africa which comprised 41% of the total child population (Statistics South Africa, 2016a). Literature indicates that the provision of safe and contextually appropriate outdoor play environments in ECD centres promotes health and development. Thus, it needs to be ensured that all these facilities have a safe space for play (World Health Organization [WHO], 2018). However, 11% of ECD centres on a national level did not have access to outdoor play areas, 20% did not have access to outdoor play equipment such as jungle gyms, and 50% did not have access to educational toys (Statistics South Africa, 2016a).

Lack of access to play spaces, equipment, resources, or play opportunities can lead to play deprivation and can affect a child's overall development, health, and well-being (IPA, 2016). Reduced play exploration and participation are highly detrimental to affected children, as well as having a knock-on effect on the communities and societies within which they reside (IPA, 2014). So far, research on play deprivation has highlighted significant disturbances in children's mental health and emotional well-being, increasing the likelihood of violence and aggression, increasing the risks of obesity and other poor physical health concerns, poor social skills, and ultimately less healthy lifestyles as adults in society (IPA, 2014). The IPA (2014) further reinforced the detrimental effects of play deprivation on our children's children and future generations to come.

Therefore, in advocating a child's right to play, exploring outdoor play spaces for children in different socioeconomic settings in Johannesburg has created the means to provide descriptive statistical information and results that can be used to find future solutions to better facilitate early child development through play in South Africa.

### **1.1.2 Statement of the Problem**

Based on multidisciplinary literature, it is well-known and widely accepted that play is important for child development and that play spaces add to the development of play (Parham and Fazio, 2008; Skard and Bundy, 2008). We also know that the access and opportunity to outdoor play space, equipment and resources for children aged 0 to 6 years in South Africa is significantly impacted by contextual affordances or constraints, such as socioeconomic status as defined by average household income quintiles (Statistics South Africa, 2016a). There was a significant lack of research literature in South Africa on the physical design and availability of equipment within the outdoor play

spaces in ECD centres, in both LSE and HSE environments. The absence of research literature on outdoor play spaces in ECD centres has negative consequences for outdoor play space policymakers, funders and educators within early childhood education. This study could address this gap by contributing valuable data and insights to inform future policies within the education department, funding, playground development, and practice within early education.

### **1.1.3 Purpose of the Study**

The purpose of this descriptive and comparative study was to determine the physical design and availability of equipment within the outdoor play spaces within Johannesburg ECD centres and to make comparisons between these factors in low versus high socioeconomic ECD centres. This aimed to provide research results related to some of the similarities and differences in the physical design and availability of equipment within the outdoor play spaces in LSE or HSE-ECD centres.

### **1.1.4 Research Question**

What is the physical design and availability of equipment within the outdoor play spaces in LSE- and HSE-ECD centres in Johannesburg and what are the similarities or differences between these contextual outdoor play space factors in LSE versus HSE-ECD centres?

### **1.1.5 Research Aim**

The aim of determining and comparing the physical design and availability of outdoor play spaces in ECD centres in LSE and HSE environments in Johannesburg was to provide research results related to what was currently available and accessible in these outdoor play spaces. The research also aimed to discuss the similarities and differences in the physical design and availability of the LSE-ECD and HSE-ECD outdoor play spaces.

### **1.1.6 Research Objectives**

The objectives were to:

- 1) Determine the physical design and availability of equipment within the outdoor play spaces in early childhood development centres in LSE environments.
- 2) Determine the physical design and availability of equipment within the outdoor play spaces in early childhood development centres in HSE environments.

- 3) Compare (similarities and differences) the physical design and availability of equipment within outdoor play spaces in early childhood development centres in LSE and HSE environments.

### 1.1.7 Justification of the Study

The research results of this study aimed to bridge the gap in the current literature on early childhood education and play spaces in South Africa regarding providing some answers or descriptive statistics to basic questions, including the following.

- 1) What do our current outdoor play spaces in ECD centres look like?
- 2) What do our children have access to play with or on outside?
- 3) What do our ECD educators think about their outdoor play space?

These answers will aid in developing the literature on the physical factors of environmental design and subjective educator views on the availability of outdoor play spaces. This information aims to be used to investigate beneficial improvements in the design of school and community playgrounds in LSE and HSE-ECD centres to help improve children's play participation, exploration, and development in South Africa. These outcomes will support the primary goal of occupational therapy, that is, to help individuals and communities develop meaningful and purposeful ways to engage in their environments.

### 1.1.8 Outline of this Research Report

This research report follows a submissible manuscript format. The layout of the report is indicated below:

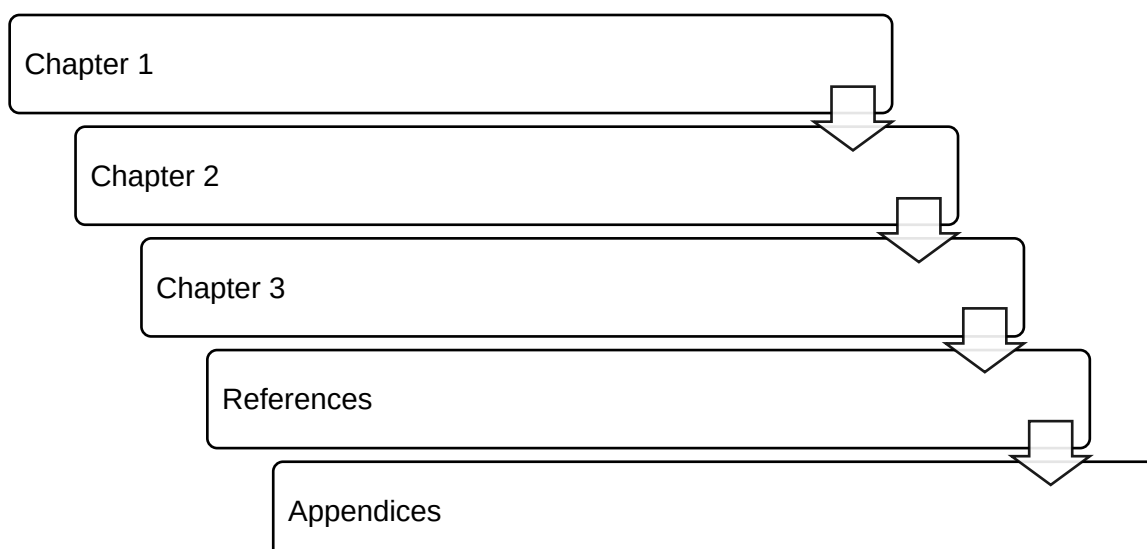


**Figure 1.1. Outline of the Research Report**

## **1.2 LITERATURE REVIEW**

### **1.2.1 Introduction to the literature review**

This literature review aims to review all current literature related to the research objectives of this study. Therefore, the literature review will explore concepts related to play as an occupation in the occupational science literature and other fields to give a sufficient background to play. It will explore the definition of play, children's rights to play and the importance and purpose of play as an occupation for children's health, development, and well-being, thus supplying this study with relevance for its research in early childhood development centres. The literature review will then explore the importance of play spaces, specifically outdoor play spaces, concerning play as an essential childhood occupation. The influence of play deprivation due to contextual constraints to play and the decline of outdoor play globally will then be discussed in depth to further understand the importance of why outdoor play spaces should be better promoted in South Africa to improve the support of children's play, early childhood development, and learning. The evolution of the design and availability of equipment within outdoor play spaces in urban environments will be explored with a variety of contextual and demographic factors considered, including socioeconomic status, disability, age, society, and culture, to determine the gaps in the literature, especially in South African play literature, and why this study is needed in the comparison of low and high socioeconomic early childhood development centres in Johannesburg.

### **1.2.2 Definition of the play**

The UNCRC (2013) highlights a child's rights to play and that a recreation, cultural and artistic life are essential for a quality childhood, a child's health and well-being, for optimal development of creativity, self-efficacy, imagination, self-confidence, resilience, as well as physical, social, and cognitive skills, and for their realisation of other rights (UNCRC, 2013). Play is a core foundation of a child's inner drive and motivation for development due to the pure pleasure and enjoyment that play provides, leading to further development of the brain, especially in the young child (UNCRC, 2013). Lester and Russell (2008) explored play research from a broad variety of academic disciplines including neuroscience, systems-based views, epigenetics, childhood geographies, sociologies, and philosophies. Gene expression and chemical reactions in a child's brain that occur through play promote the child's ability to adapt, learn to survive, or even thrive within their social and physical environments (Lester & Russell, 2008). Children learn by doing i.e., they learn how to

explore, engage, experience, and experiment with the world around them, their impact on the world, and thus develop their role and identity within the world (UNCRC, 2013).

Tanta and Knox (2015) understood play by describing the form of play that includes the characteristics of the play, the function of play that includes the purpose and process of the play in the development of the child, and the meaning of play based on subjective meaning and experience. Other dispositional characteristics of play including that play can both suspend the constraints of reality and reflect reality, that the player controls the play, and that the play is safe, usually fun, and unpredictable and includes non-compulsory active engagement (Stagnitti, 2004). Importantly, for this study, play has been described as an activity that occurs in a safe and comfortable environment to promote participation in play (Parham, 2008). Despite some ambiguities and non-consensus regarding the definition, purpose and form of play, there is a clear and evidence-based understanding of the importance of play for the player's health, development, and wellbeing (Lester & Russell, 2010).

Lester & Russell (2008) reinforce the above discussions about the occupation of play as having a transactional relationship with the child or community and the context, in their emphasis on the child not being a separate entity from their environment, and therefore their conclusions that children's health, development and wellbeing subsequently cannot be understood without a holistic picture of the child's transactional participation within their environments. The transactional relationships between an individual and the environment and the importance of the quality of the individual-environment goodness of fit is frequently highlighted in occupational science literature, as well as more specifically in the environmental supportiveness of play (Hamm, 2006; Bundy, Waugh & Brentnall, 2009; Lim et al., 2016; Guichard, Coelho & Grande, 2023).

Lester and Russell (2008) concluded that the transactional relationship between a child's genes, brain, body, behaviour, and physical and social environment is crucial for understanding the fundamental contributions that play has on the overall health, development, and well-being of a child (Lester & Russell, 2008, 2010).

### **1.2.3 The transactional relationship between children, context, and play**

As a result of the wide variety of contextual factors (personal and environmental) and the transactional relationships between the individual or community (in this case, the children), the environment (in this case, the physical environmental context surrounding play), and

the occupation of play, the definition of play, the purpose of play and the experiences of play vary significantly globally.

Tanta and Knox (2015) described play participation as a construct that indicates how play itself cannot be separate from physical contextual factors that include both the where, and the what of play (place, equipment, resources). The same for personal and sociocultural contextual factors that include socioeconomic status, expectations, quality of care, caregiver-child relationships and playful interactions, child-rearing, schools, and the media (Tanta & Knox, 2015). Contexts offer both affordances and constraints to play. Contextual factors that afford play and playfulness include familiar play partners, toys and other play materials, freedom to choose, unobtrusive adults, a safe and non-threatening environment, and time for play outside of sleeping, feeding or stress (Tanta & Knox, 2015). Contextual factors that constrain play include excessive novelty and challenge, few choices, excessive competitive elements, and technological advances in the digital world (Tanta & Knox, 2015). Parham and Fazio further describe how play is influenced by culture or disability, and important to this research study is how occupational therapists can advocate for play (Parham & Fazio, 2009).

The IPA (2016) suggests how the physical environment plays a positive role in shaping play opportunities and play quality through the appropriate provision of space and time for play. These can facilitate further drive for play and development of play skills, or negatively through environmental exposure to poor quality conditions and risks detrimental to children's physical health (illness, disease, malnutrition) or safety which can cause reduced play motivation and play skills. There are still many contextual barriers to play and barriers to children realising their rights under Article 31 (United Nations Human Rights Office of the High Commissioner, 1990).

The IPA (2016) highlights certain general contextual barriers to children's play worldwide, including a poor home environment; an impoverished neighbourhood environment; a physically unsafe or toxic neighbourhood environment, especially in the poorest communities; a lack of opportunity and access to outdoor play in nature and with the animal world with increasing urbanisation; poorly placed play sites in cities; fear of violence in parks and playgrounds with dominant groups of often older boys and men; and climate change affecting especially those children in high-risk areas such as informal settlements.

Tovey (2019) highlighted urbanisation, a culture of fear in an unsafe world, over-organised schedules in institutional settings, extra-murals, adult supervision, and other after-school

organised activities to reduce free play in the outdoors. Reduced tolerance for play by parents and communities, reduced active commuting to and from school and rather increased car travel time with screen-time entertainment, lack of space in urban settings and an increased reliance on schools or commercially-driven play areas for play support, increased screen-time and participation in the 2D virtual world with little sensory-motor feedback and social participation are also factors in the global world that are negatively impacting outdoor free play (Tovey, 2019).

Other reasons for the global decline in outdoor play include lack of space or access to space, both parents working, increased need for aftercare settings, time constraints, physical safety on the playground, parental fear of risky play, decreased sense of community, transportation limitations, dirt, parenting styles, parental overprotection, neighbourhood poverty, and a push by education systems for education in place of play (Garrick, 2009; Singer et al., 2009; Kimbro & Schachter, 2011a; Little, Wyver & Gibson, 2011; Witten et al., 2013; Allin, West & Curry, 2014; Holt et al., 2015; McClintic & Petty, 2015; Nel, Joubert & Hartell, 2017; Reimers et al., 2018; Cronin-De-Chavez, Islam & Mceachan, 2019; Kalpogianni, 2019; Tovey, 2019; Kepper et al., 2020; Cheng et al., 2022; Visser & van Aalst, 2022; Akdemir, Banko-Bal & Sevimli-Celik, 2023; Morgenthaler et al., 2023). Outdoor play globally and in South Africa in all socioeconomic environments is significantly declining for a number of these reasons.

#### **1.2.4 Importance of outdoor play spaces**

Frost and Sutterby (2017) highlight how the importance of outdoor play is not new and has been recognised since Friedrich Froebel, an influential German scholar of the 19<sup>th</sup> century. They developed the concept of *kindergarten* (“garden of children”) that reinforced the importance of a garden, the growth and development of each individual child within nature, and the interrelationship between humans and nature on a spiritual level. The kindergarten movement spread quickly to America and grew during the 19<sup>th</sup> and 20<sup>th</sup> century, when play and outdoor play environments were valued with great importance for education (Frost & Sutterby, 2017) .

The playground movement followed soon after with a great emphasis on increasing play, exercise, and health for young children and young people in urban areas; however, it had significant limitations concerning segregation of people due to race, ethnicity, and culture and therefore did not provide playground access for all (Frost & Sutterby, 2017). Ultimately, Frost and Sutterby (2017) reinforce the value that researchers and play enthusiasts over

the many movements have placed on the development of the entire child and improving the quality of children's lives with outdoor play and nature.

Playgrounds in America transformed with the development of classical and contemporary play theories (Johnson et.al., 2015). Later playgrounds then started to focus additionally on the emotional and cognitive development of children based on Freud's emotional theories. Later Walder's (1933), Erikson's (1950), and Piaget's (1962) cognitive stages of development with a focus on language, learning, and socialisation. These theories called for play opportunities with further privacy, areas for social play, and the addition of moveable materials/ loose parts to provide opportunity for experimenting and planning (Johnson et.al., 2015). Play theory evolution led to various types of play by Piaget, stages of play by Parten, and play epochs designed by Occupational Therapist, Takata, which started giving us a better understanding of playfulness and how context and culture can influence play (Parham, 2008).

Motor games were seen more on traditional playgrounds and dramatic and construction play were seen more on creative playgrounds with a range of loose parts, and that sand underneath structures as an additional means of safety led to increased play behaviour, time spent playing, and social play (Johnson et.al., 2015). Additional materials in an environment, including recycled materials, have also been shown to lead to increased variety of play activities, creativity, social skills, resilience, positive affect, and physical play (Bundy et al., 2008; Engelen, Bundy, Lau, et al., 2015; Engelen et al., 2018). Another research study demonstrated that semi-private spaces with visibility to other play spaces facilitated fantasy play, the addition of loose parts facilitated construction play, which led to the building of dramatic play areas and additional communication skills (Maxwell, Mitchell & Evans, 2008).

Adventure playgrounds were later shown to be accessible and more inclusive to those with impairments or disabilities based on their characteristics, including a place with space and opportunities with a permissive atmosphere for children to be free to perform activities that are not easily performed in crowded urban living (Johnson et.al., 2015). The features of adventure playgrounds include unobtrusive play leaders, building areas, cooking areas, gardens, sand-filled areas, climbing structures, and indoor recreation for weather constraints (Luchs & Fikus, 2013b; Wragg, 2015).

Modern-day adult-designed playgrounds are often designed with developmental characteristics in mind; however, they do not consider the important adventurous elements

of being within nature that make play creative and fun (Munoz, 2009). There has been extensive research globally on play space development, design, and playgrounds. Playgrounds have evolved worldwide with regard to the beneficial addition of loose or moveable materials such as recycled materials, having creative or adventure playgrounds versus traditional playgrounds, incorporating semi-private spaces and having design principles following children's natural characteristics of play, which have all been proven to improve creativity, variety and flexibility, social skills and communication, and positive affect ((Johnson et.al., 2015; Bronson & Bundy, 2001; Bundy et al., 2008; Maxwell, Mitchell & Evans, 2008; Bundy, Waugh & Brentnall, 2009; Frost & Sutterby, 2017; Engelen et al., 2018; Grady-Dominguez et al., 2019).

Access to greenspaces or nature has also been shown to have positive effects on health, including improving cholesterol and blood pressure levels, increased physical activity, improving psychological and mental health, lowering stress levels, helping recovery from mental fatigue, and improving overall wellbeing and social interaction. In addition to these health benefits, for children playing in the outdoors has been shown to have positive effects on education and learning, attention deficit hyperactivity disorder, alleviating mental health concerns as adolescents, improving the understanding of risks in environments, and healthy immunity development which improves school attendance (Munoz, 2009).

Play in natural outdoor spaces also facilitates further active play and motor development of balance, coordination, and strength (Munoz, 2009; Luchs & Fikus, 2013). This was supported in a study that stated how unstructured, free, child-directed outdoor play and play in natural environments are vital for the benefit of a child's physical, cognitive and social development, their overall health and well-being, as well as helping with self-regulation strategies and attention skills for children in various contexts and cultures (Kemple, Oh, Kenney & Smith-Bonahue, 2016). Outdoor play allows young children opportunities for the freedom to experiment and explore through interactions with a dynamic natural environment that allows for curiosity, creation, and wonder, as well as provides a 'whole-body multi-sensory experience' (Tovey, 2019, p.37), materials with which to problem solve and make learning connections, a place for social participation with others to develop vital social skills including negotiation and conflict resolution, a place for pushing boundaries, an opportunity for silliness and happiness, and a variety of movement opportunities for sensory development (Tovey, 2019).

Importantly, Tovey (2019) further states how many of the above natural learning opportunities cannot take place in a structured classroom or traditional playground.

Reinforcing the need to create opportunities for children to access natural environments for outdoor play spaces should be part of the solution to address health and education inequalities in South Africa (Department of Education, 2001; Statistics South Africa, 2016b; Statistics South Africa, 2024a; Statistics South Africa 2024b; Department of Basic Education, 2018).

Munoz (2009) recommended further research on the links between children in the outdoors and nature within the educational context, especially across age, gender, country, culture, and socioeconomic status to better understand children's use of the outdoors in these different contexts. School and community approaches must focus on these benefits of whole child development when planning indoor and outdoor learning and play spaces to continually promote development, health and well-being through the creation of optimal outdoor spaces for children to play (White, 2008; Garrick, 2009; Olsen, 2013; Frost & Sutterby, 2017; Thomas, 2018; Kalpogianni, 2019; Tovey, 2019). There are a variety of contextual factors, including personal, sociocultural, political, geographical, and environmental constraints, barriers, and limitations to optimal play participation, which can lead to deprivation of play.

### **1.2.5 Influence of play deprivation**

The concept of play deprivation was highlighted in an experiment that today would be an unethical animal experiment titled "Monkeys Without Play" by Suomi and Harlow in the 1970s, which highlighted the extreme consequences for monkeys that were not allowed to play. This in application to children reportedly changed the view of why play deprivation can be so harmful for young children and how necessary free active play is (Brown & PlayWales, 2013).

Despite growing research showing the need for improved early life experiences for a child's development and well-being, children are experiencing play deprivation and marginalisation from safe outdoor play on a large scale, especially those children who are considered vulnerable groups. Play deprivation has been reported to be the result of the views that spontaneous play is wasted time, poor quality outdoor play spaces, equipment with safety concerns, extra-curricular activities and sports, technology, overscheduling, abusive childhoods, and the reduction or elimination of playtime during the school day (Lauer, 2011). Lauer (2011) further reinforces the negative consequences of play deprivation on children and adults, which he reported could include increasing violence, aggressive behaviour and criminal activity, reduced brain activity, reduced muscle fibre

growth, decreased development of social skills including communication and problem-solving, and being at a higher risk of obesity. Chronic play deprivation was discussed to lead to biological and social dysfunction and dehumanising effects later in life, however, opportunities for engagement in quality play experiences can counteract the negative effects of play deprivation (Lauer, 2011).

### **1.2.6 Contextual play constraints in South Africa**

In the South African context, there could be various contextual factors, such as political, geographical, and environmental constraints. Poverty can play a significant role in the ability to play. In both rural and urban low socioeconomic settings in South Africa problems related to fragmented families, care by extended family members, absence of fathers due to unemployment or from the beginning of the child's life, and the effects on children who have to help care for even younger members of the family that will have a significant impact on the time, space, and freedom children in these families have to play (Bray & Brandt, 2007). Children living in poverty in urban areas are less likely to have access to gardens or green spaces and are more likely to live in overcrowded settings, be exposed to traffic and road accidents, and are more likely to be separated from public and private outdoor play spaces (Tovey, 2019). Safety and parental restrictions occur as an extremely limiting factor in outdoor play for children and a decrease in a sense of community (Holt et al., 2015). Fears of mothers about their children playing outdoors were associated with living in poverty in America (Kimbrow & Schachter, 2011b). There has been extensive research on how parents, caregivers, and teachers as 'gatekeepers' create barriers to children's freedom to play outdoors and their outdoor activities, with their fear and anxieties about children's safety (Munoz, 2009).

There are, however, also contextual factors that can lead to children's fears around outdoor play spaces such as strangers, inappropriate teenage activities, and previous unsafe personal experiences, and thus the home is often considered a safe zone (Munoz, 2009). Another factor that impacts and limits outdoor play of children, especially risky outdoor play, is the overprotection of children on the playground due to overstructured playgrounds that adhere to safety protocols and regulatory requirements for safety (Little, Wyver & Gibson, 2011; Guirguis, 2018; Akdemir, Banko-Bal & Sevimli-Celik, 2023; Sturges et al., 2023). These fears can influence the type of play activities that are chosen.

Singer et.al. (2009) identified that in developing countries, including South Africa, children spent 78% of their time watching television and 49% playing outdoors. A recent study by the World Health Organization [WHO] (2019) of infants and toddlers from South Africa

showed that 94% of infants and toddlers exceeded the recommended WHO television time for their age. Research by Slutsky and DeShetler (2017) shows that preschool children are engaging with a range of different types of digital technology daily due to so much more being available to families, being cheaper, and specifically targeted for preschool age children. Engelen et al. (2015) highlights the importance of better understanding the other activities children may be doing indoors or in sedentary behaviours after school, other than screen-based or technology-driven activities, as screen-time in her study was not the only factor keeping children sedentary after school. Children attending low-income preschools in Cape Town were shown to spend 93% of their time indoors compared to children at high-income preschools who spent 79% of their time indoors (Jones, Hendricks & Draper, 2014). Furthermore, this study showed that children in both settings were more likely to engage in mild, moderate, and vigorous physical activity when outdoors (Jones, Hendricks & Draper, 2014). Grade R teachers in South Africa were shown to value outdoor play; however, they had contradictory views regarding how to implement effective learning environments while using outdoor play (Nel, Joubert & Hartell, 2017). Ramugondo (2012) highlighted the significant impacts of rapid social change on play over generations and how television is one of the significant factors that has caused change in the way children play now. Physical activity and time spent outside were found to be higher for boys than for girls for infants and toddlers in South Africa (Prioreschi et al., 2017).

Despite children preferring outdoor activities, research demonstrates that children still tend to spend more time on sedentary indoor activities such as indoor play tasks and television (Lupu, Norel & Laurențiu, 2013). The place that children perceive to be valuable and important to play and be physically active is, however, very dependent on the child's age and the type of urban neighbourhood in which they live or disabilities. (Holt et al., 2008, 2015). Barriers specific to children with disabilities include inaccessible playground equipment, outdoor play spaces and infrastructure, stigma, and other negative attitudes, and poorly implemented policies with regard to their inclusion in play programmes (Missiuna & Pollock, 1991; Hamm, 2006; Talay, Akpınar & Belkayali, 2010; IPA, 2015; Morgenthaler et al., 2023). Children in South Africa who are HIV positive with significant developmental delays and who are not being treated with their highly active antiretroviral treatment have been shown to have difficulties with elements of their playfulness, including internal control and freedom from constraints of reality (Ramugondo et al., 2018). Therefore, this demonstrates how a child's physical health can have negative implications on how they can play in their play environments.

### 1.2.7 Outdoor play spaces in South Africa

It has been reported that the large numbers of children enrolled in ECD centres in South Africa, as well as the lack of resources, have a significantly negative influence on the way children can play in the play spaces in ECD centres and pose a challenge for ECD teachers in this field (Berris & Miller, 2011; Chikutuma, 2013; Nwokah, Hsu & Gulker, 2013; Olsen, 2013; McClintic & Petty, 2015; Trawick-Smith et al., 2015; Statistics South Africa, 2016a; Statistics South Africa, 2024a; Van Heerden, 2016; Aubrey, 2017; Davies & Hamilton, 2018; Labantwana, 2019; Phajane, 2019; Sandseter et al., 2020; Madyibi & Bayat, 2021; Pretorius & Heerden, 2021; Aina & Bipath, 2022; Cheng et al., 2022).

Adams, Savahl and Fattore (2017) described how despite South Africa's substantial gains made in the advocacy of children's rights through policies and legislature, there has been little or no implementation into safer environments for children in their daily lives, or towards the building of environmentally friendly, natural, and child-friendly communities and cities in South Africa. Literature on the physical outdoor play contexts in relation to the physical design, equipment, resources, space, and quality in South Africa is extremely limited, other than the basic information provided by Statistics South Africa (2016). New literature or statistics on playgrounds, equipment, or toys were not found by the author since the figures mentioned above from 2016.

Children from urban and rural communities in the Western Cape, South Africa, were found to place natural play spaces as their favourite play spaces, that the children's view and sense of these natural play spaces was very different depending on their socioeconomic status and finally that safety concerns, mobility and access to safe natural play spaces were the most limiting factor, especially for children of low socioeconomic backgrounds (Adams, Savahl & Fattore, 2017; Savahl, Adams & Hoosen, 2023).

Some studies have explored promising initiatives in implementing new spaces in low-income settings to encourage further outdoor play and physical activity in children or in upgrading current community playgrounds in a study that demonstrated increased levels of physical activity and lower body mass index scores after the implementation of upgraded outdoor settings (Quigg et al., 2012; Cronin-De-Chavez, Islam & Mceachan, 2019; Mölenberg et al., 2019; Moore, 2019; Schlesinger & Hirsh-Pasek, 2019; Morgenthaler et al., 2023). A South African community playground initiative initially termed Back to Urth playgrounds, and now termed Sensory Spaces was developed by occupational therapists to address sensory integration difficulties in children living in disadvantaged communities. The project aims to use community stimulation programmes and low-cost sustainable

playgrounds to address difficulties in play and sensory integration (van Jaarsveld, 2018; van Jaarsveld et al., 2021).

### **1.2.8 The purpose of play as an occupation**

Play is widely considered a child's primary occupation in occupational science literature (Parham, 2008). Play, especially for children from birth to eight years, is recognised as the window into the child's development and the driver of learning in early childhood (Lynch & Moore, 2016, pg 1). Occupational therapists assess and use play as a means of intervention to promote health, development, and well-being, as well as use play as an aim of intervention to focus on the occupation of play itself (Parham & Fazio, 2009). Play is used more frequently in occupational therapy as a means of intervention to promote other developmental outcomes. The need to embrace play as a child's primary occupation has been emphasised in the literature to promote play itself as a therapeutic aim (rather than a means), as a right of the child, and for increased play participation (Lynch & Moore, 2016). Occupational science research has shown how child participation and engagement in outdoor spaces is contextually situated, flexible, adaptable, and has similarities and differences across minority and majority world cultures (Njelesani et al., 2011). Therefore, this study reinforces the importance of assessing the occupation of play in the context of the child.

Promoting play participation in this way can be achieved through the accessible provision of safe and effective outdoor play spaces and preventing play deprivation (Parham, 2008), as well as through the advocacy for outdoor play participation and social inclusion of all children with and without disabilities through accessibility and usability of their environments and prevention of environmental barriers (Moore & Lynch, 2015; Moore, Lynch & Boyle, 2022; Moore, Boyle & Lynch, 2023). Taking into account the transactional nature of play as an occupation and how vital play participation is in participation in occupations, occupational therapists need to play a role in the planning for the environmental aspect of play context, the physical design and availability of equipment within outdoor play spaces. By using our knowledge of child development and play the occupational therapist can better advocate for play resources in early intervention spaces. Provision of play space through child-sensitive play-friendly design, although not fully achieving the right to play, can allow further opportunities for safe and healthy play, especially for children who are exposed to poor quality and unhealthy conditions and risks in their environments (IPA, 2016). Lynch & Moore (2016) suggested that occupational therapists take heed of the policies to promote, as mentioned above, play as a therapeutic

aim, play as a child's right, and play for improved participation. (UNCRC, 2013). The UNCRC (2013), in Article 31, General Comment 17, lists recommendations and conditions on how to better create a supportive environment that better fulfils a child's rights.

The role of occupational therapists in the advocacy for social inclusion of all children through the accessibility and usability of their play spaces and the prevention of environmental, financial, or social barriers has been highlighted in the literature (Moore & Lynch, 2015; Moore, Lynch & Boyle, 2022; Moore, Boyle & Lynch, 2023; Morgenthaler et al., 2023; Wenger et al., 2023). Similarly, occupational therapists can promote active free play in the home, at school, and in the community for children with disabilities or children who are disabled by environmental barriers, by careful consideration of the child and the environment that causes play deprivation for that child (Missiuna & Pollock, 1991; Stagnitti, 2004; Bross, Helen; Ramugondo, Elelwani; Taylor, Claire; Sinclair, 2008; Bundy et al., 2008; Parham & Fazio, 2009; Njelesani et al., 2011; Hyndman, 2015; Lynch & Moore, 2016; Miller et al., 2017; Ramugondo et al., 2018; American Occupational Therapy Association, 2020; van Jaarsveld et al., 2021; Visser et al., 2021).

All the information presented so far in play research has significant implications for the development of policies and practices worldwide, but especially for this study in South Africa. It is important to note that these policies for play and creating play spaces would be in line with the Sustainable Development Goals for 2030. Creating safer and more resilient communities through the promotion of play is important. environmental awareness by South African children in this study, nature should be a primary focus when designing a child-friendly city to promote children's health and well-being, society health and well-being, and the care and well-being of nature itself.

### **1.2.9 Conclusion to the literature review**

This literature review has highlighted the importance of understanding play as a complex childhood occupation that is not easily defined, but of fundamental value to children who engage, explore, and experiment with their environments through play. The review has explored the transactional nature of play and its interconnectedness with the context and environments that it takes place in and is not separate from. This has been viewed from an occupational science perspective, but also from a variety of other play disciplines. Play and children cannot be seen or understood without understanding why their advocacy is of vital importance, and therefore, children's Article 31 rights were reviewed with the General Comment 17 of the United Nations Committee on the Rights of the Child, especially regarding vulnerable groups around the world. The significance of play, as well as play and

being outdoors for children's health, development, and general well-being was reviewed and cannot be disputed with the wealth of research in this regard. Despite this significance, there is still such a growing prevalence of play deprivation worldwide. The reasons for this were reviewed, including all contextual barriers to outdoor play, as well as why there is a global decline in outdoor play. The purpose of this research is to explore outdoor play spaces and to determine the physical design and availability of equipment within outdoor play spaces in ECD centres in Johannesburg. Therefore, it was essential to understand the history and evolution behind outdoor play space development globally, and finally what is currently taking place as to outdoor play space design globally and in South Africa. There were significant gaps in research on what playgrounds or outdoor play space opportunities are currently available in South Africa, and therefore the importance of this study to fill the literature gap.

## **1.3 METHODOLOGY**

### **1.3.1 Study Design**

A descriptive quantitative survey study design was used to address the aim and objectives of the study to determine and compare the physical design and availability of equipment within the outdoor play spaces in ECD centres in Johannesburg. This information was analysed using descriptive and inferential statistics to support future research on the need for improvement of physical design, as well as access and availability in outdoor play spaces. Qualitative components were included in the textbox options within the survey where additional or other information could be provided to the research participants. These qualitative components in addition to the photographic evidence of the outdoor play spaces were analysed using content analysis for additional information to supplement the primary quantitative study design and data analysis.

### **1.3.2 Study Setting**

This research initially took place in the virtual environment through an online Redcap® research questionnaire that was emailed or texted to a variety of head teachers and principals representing ECD centres across Johannesburg. The research subsequently took place via telephone consultations, as well as physical in-person visits to ECD centres around Johannesburg to gain further research participants, especially those where internet connection or limited data impacted the ability to participate in the virtual questionnaire. Areas accessed through virtual, telephonic, and/ or physical in person visits to the ECD centre in Johannesburg included but were not limited to Johannesburg North (Sandton, Rosebank, Craighall, Melrose), Johannesburg East (Kew, Edenvale, Sydenham, Orange Grove, Orchards, Glenhazel, Lombardy East, Alexandra, Bramley), Central Johannesburg (Saxonwold, Houghton, Yeoville, Parktown, Braamfontein), and Johannesburg South.

### **1.3.3 Participants**

#### **1.3.3.1 Population**

Due to the level of development that occurs in the early years, it was important to determine the outdoor play spaces available to children in their early years to understand what aspects of outdoor play spaces could facilitate this development. Research participants included principals or head teachers who were able to represent their respective ECD centre's outdoor play space in Johannesburg. The research population therefore included principals

or head teachers representing ECD centres in Johannesburg (North, South, East, West, and Central) that provided early childhood development services.

### 1.3.3.2 Sample selection

The ECD centres that were invited to participate in this study were obtained from database lists with relevant contact details of the ECD centre titled “Gauteng ECD Membership 2021” and “Grade R Community Independent 22 (CBS)” which were issued from the Department of Education after approval for the study was granted. ECD centres not accessible from the issued lists due to outdated or incorrect email addresses, telephone numbers or physical addresses, were accessed from Google searches using the search keywords “preschool”, “nursery school”, “daycare centre”, “early childhood centre” and “early learning centre”. Other centres were accessed by word of mouth, social media advertising of the research study invitation in public forums such as the Facebook public group “FNB ECD”, teacher referrals, and visual signage or branding observed outside of the centres while the researcher was driving through Johannesburg. The ECD centres were selected based on their meeting of the inclusion criteria set for the study.

#### 1.3.3.2.1 INCLUSION CRITERIA

The original research protocol submitted for review proposed the following inclusion criteria.

##### *Proposed Inclusion Criteria:*

- Registered ECD centres for children age 0-6 years in the Johannesburg region
- ECD centres in the lowest income quintiles (i.e. quintile 1) and ECD centres in the highest income quintiles (i.e. quintile 5)

However, minor changes to this inclusion criteria were made upon data collection. Below includes a description of the inclusion criteria actually used in the study as well as explanations for the deviations from the original research protocol.

##### *Actual Inclusion Criteria:*

1. A research participant should be the principal or head teacher of a registered ECD centre for children aged six months to six years in the Johannesburg region.
  - In addition to the specified inclusion criteria of six months to six years, ECD centres catering to infants or toddlers younger than six months were also included in this study.
  - It should be noted that some principals and/ or head teachers indicated difficulties regarding the registration process in the months over the time data were collected (2022 and 2023) since the ECD centre registration process had changed from the

Department of Social Development to the Department of Education, therefore, there were some ECD centres included in the research sample who were not yet registered with the Department of Education.

2. A research participant, to the best of their knowledge, should indicate that their ECD centre falls within a low socioeconomic status or in a high socioeconomic status in the Johannesburg region.
  - It should also be noted that although there are specific means of defining socioeconomic status, that is, by calculating income quintiles using total monthly household incomes or per capita median income multiplied by household size (Statistics South Africa, 2024b), this inclusion criteria was completed based on the subjective view of the principal or head teacher of whether or not their centre represented a low versus high socioeconomic ECD centre and not based on accurate income quintiles of teachers or parents of children attending the ECD centre. It was shown that in Gauteng almost 29,8% of children aged 0-6 years lived in households within the highest income quintile (quintile 5) and 11,7% lived in the lowest income quintile (quintile 1) (Statistics South Africa, 2016). Therefore, in this research study, the inclusion criteria for the socioeconomic status of the ECD centre were determined by subjective means and were not based on accurate or precisely measured income quintiles to represent each comparison sample.

#### 1.3.3.2.2 EXCLUSION CRITERIA

- There should only be one representative (principal or head teacher) per centre to represent their outdoor play space, and therefore duplicate representatives were excluded from the study.
- Centres that included Grade R, including primary schools or schools with foundation phases, but did not include early childhood development years, were excluded from the study as they did not fall into the criteria of an ECD centre for children aged six months to six years.
- Crèches that catered only for children under six months of age were excluded from this study, as the study aimed to collect data specifically for children who would access the outdoor play spaces in the ECD centres the most.

#### 1.3.3.3 Sampling method

A total population sampling method was used for the distribution of the research questionnaire to ECD centres in the Johannesburg area that met the inclusion criteria, to

include as many LSE- and HSE-ECD centres as possible, for the sample to represent as much of the total population as possible (Bhardwaj, 2019). It was important to ensure, however, that the sample size, especially the size of each of the independent control factors being compared (LSE and HSE) were sufficient so that there would be a reliable sample size to fairly represent each population being compared.

#### 1.3.3.4 Sample size

A sample size of a minimum of 60 ECD centres, a minimum of 30 from the low socioeconomic ECD centres and a minimum of 30 from the high socioeconomic ECD centres were needed for a 5% margin of error as recommended by Cochran's formula (Bartlett, Kotrlik & Higgins, 2001). The final sample size included a total of 82 ECD centres, with 28 representing LSE-ECD centres and 54 representing HSE-ECD centres. The variations in sample size for each of the independent control variables (low and high socioeconomic status) were impacted by several factors further discussed under the limitations of the study. The total sample was extended to some regions in Greater Johannesburg, including far South and far East areas of Johannesburg that were a part of the "Gauteng ECD Membership 2021" database list.

#### 1.3.4 Procedure of Data Collection

After ethical clearance was obtained from the Human Research Ethics Committee (Medical) of the University of the Witwatersrand (M200956) (Appendix A) and approval from the Gauteng Department of Education (Appendix B), ECD centres were identified for inclusion in the study. This included the use of database lists or other research methods to access the contact details of the ECD centres in Johannesburg. The principal or head teacher at each school was contacted and the Information Letter (Appendix C), the Informed Consent Form (Appendix D) and the Permission Letter for Photographs to be used (Appendix E) were sent to them via email or was given as a hardcopy in-person. Once informed consent was obtained and inclusion was confirmed according to inclusion criteria, the school principal or head teacher could continue with the completion of the questionnaire developed by the researcher. The questionnaire was completed through the online Redcap® link via email, SMS or Whatsapp, as well as telephonically with the researcher and in person with the researcher on visits to the Johannesburg ECD centres. Email reminders were sent regularly to those participants who had not yet completed or had only partially completed the questionnaire. Phone calls and SMSs were also used to follow-up with research invitations to participate to provide further information about the research study to the

principals or head teachers at the ECD centres. The researcher also used in-person visits after permission from the centres to visit to complete the research questionnaires, especially in the case of access to data, internet connection, lack of working email addresses, language barriers, or lack of signal over the phone. Many ECD centres permitted photographs either on their completed online questionnaire in Component E or during an in-person visit to the ECD centre on-site using the signed photograph form. The researcher ensured that no children were part of the photographed areas of the outdoor play spaces as outlined in the permission letter and on the questionnaire. Other ECD centres attached photographs to the questionnaire in the question provided or emailed through additional photographs. Photographs were used to provide additional visual information and to supplement quantitative data collected around the physical design and quality of the outdoor play spaces. Data were collected over several months, between June 2022 and May 2023.

### **1.3.5 Data Collection Instrument – Content Validity**

An initial questionnaire was designed by the researcher (Appendix F) based on relevant outdoor play space information and play assessment obtained from the literature review, as well as in consideration of the research aims, objectives and inclusion criteria. A content validity study was performed using five professional experts in the field of early intervention and/ or outdoor play spaces via an online RedCap® content validity questionnaire. These experts included architects in the early education space, experienced Paediatric Occupational Therapists and Education Specialists. The link to the online questionnaire was shared with the expert participants via email and was completed after they gave informed consent (Appendix G). Each question was rated by the experts for relevance, ambiguity, clarity, and simplicity. The information received from the panel of five experts was analysed in Excel by using the content validity index for universal agreement analysis (Polit and Beck, 2006). According to Polit and Beck (2006), if there are three to five experts who evaluate the questionnaire, it is recommended that the I-CVI = 1.0. The results from this study's content validity analysis from five experts indicated I-CVI between 0.8 and 1.0 (Appendix H) in the categories of relevance, clarity, simplicity, and ambiguity. Thus, questions with an I-CVI score of 0.8 were adjusted according to the expert's recommendations. Minor corrections to the questionnaire can be noted in Appendix I.

### **1.3.6 Translation**

The research questionnaire was only available in English. Therefore, to ensure validity and reduce interpreter bias, in most of these cases, a teacher or principal who was able to read and write in English completed the research questionnaire. In cases where principals or

head teachers better understood verbal English than reading and writing, the researcher verbally read the questions out loud and wrote the answers word for word as a scribe. In some questions when the researcher was verbally disseminating the research questionnaire, other teachers or assistants were able to assist with translation if certain words or phrases in the questions were unfamiliar. Google Translate was readily available in the case that there was no translator at the ECD centre, however, this was not required in this research study.

### 1.3.7 Data Collection Instrument – Research Questionnaire

**Table 1.1. Outline of the Research Questionnaire designed by the Researcher**

| Research objective                                                                                                                                                          | Questionnaire Section & Information included                                                       | Theoretical basis                                                                                                                                               | Question type                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <i>Ethical considerations</i>                                                                                                                                               | Information letter (Page 1)                                                                        | Researcher's self-developed information based on relevant outdoor play space information discovered through the literature review.                              | Front page with research title                                                                                                        |
| <i>Sample selection</i>                                                                                                                                                     | Inclusion criteria (Page 2)                                                                        | Researcher's self-developed inclusion criteria based on relevant outdoor play space information discovered through the literature review.                       | Please only fill in this questionnaire if you meet the following inclusion criteria for this research study:                          |
| 1) To determine the physical design and availability of equipment within the outdoor play spaces in early childhood development centres in low socioeconomic environments.  | <b>Component A:</b> Demographics within ECD centre outdoor play space/s (Pages 3 – 5)              | Researcher's self-developed questions, based on relevant outdoor play space information discovered through the literature review as well as inclusion criteria. | Question A7. To the best of your knowledge, which category would you place your ECD centre in in terms of its socioeconomic position? |
| 2) To determine the physical design and availability of equipment within the outdoor play spaces in early childhood development centres in high socioeconomic environments. | <b>Component B:</b> Type of outdoor play space/s, play space equipment and resources (Pages 6 – 9) | Researcher's self-developed questions, based on relevant outdoor play space information discovered through the literature review.                               | Question B1: What type of playground would best describe the outdoor play space/s at the ECD centre?                                  |
| 3) To compare (similarities and differences) the physical design and                                                                                                        | <b>Component C:</b> Other physical characteristics of outdoor play space/s (Pages 10 – 11)         | Researcher's self-developed questions, based on relevant outdoor play space information discovered through the literature review.                               | Question C1: Please select the type/s of terrain that can be found in the outdoor play space/s at the ECD centre?                     |

|                                                                                                                                             |                                                                                                           |                                                                                                                                                                                                                                |                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| availability of equipment within the outdoor play spaces in early childhood development centres in low and high socioeconomic environments. | <b>Component D:</b><br>Subjective view of the outdoor play space/s (Pages 12 – 14).                       | Adapted from Bronson & Bundy's Test of Environmental Supportiveness (2001), from the Revised Knox Preschool Play Scale (1968), and from Ayre's Sensory Integration fidelity measure structural elements (Parham et. Al, 2007). | Question D1: How much do you agree with the statement below – 'The outdoor play space/s at the ECD centre is physically safe'                                                                                        |
| <i>Ethical considerations</i>                                                                                                               | <b>Component E:</b> Outdoor play space/s photographs permission and ECD centre Visit Permission (Page 15) | Researcher's self-developed questions based on relevant outdoor play space information discovered through the literature review.                                                                                               | Question E2: Do you give permission to the researcher to visit your ECD centre to take photographs of the outdoor play space (without children) to obtain further visual information to support this research study? |

This study used a questionnaire designed by the researcher using relevant outdoor play space information accessed from the literature review. The final online RedCap® research questionnaire can be found under Appendix J. Component A of the questionnaire contained questions to obtain demographic information from the ECD centre, including the ages of the children in the centre, the subjective socioeconomic status, the funding, and the total of children attending the centre according to the inclusion criteria and the research study aim and objectives. The questions in components B and C were designed with regard to the physical design elements of the outdoor play space including availability of outdoor space, size of outdoor space, playground equipment such as jungle gyms, toys or other loose multi-purpose items with various sensorimotor elements, safety, security boundaries, natural versus built environments, and the terrain or ground surfaces. The questions set in Component D were designed to obtain further information on the quality of outdoor play spaces based on the subjective views of the head teacher or principal using a Likert scale for the level of agreement with several statements. Component D questions were adapted from Bronson and Bundy's Test of Environmental Supportiveness (TOES), the Revised Knox Preschool Play Scale (RKPPS), and Ayres Sensory Integration® fidelity measure structural elements. For the

questionnaire from this study, TOES scores are also descriptive (Skard, Geva; Bundy, 2008). The TOES and RKPPS are both publicly published play assessments, therefore no permission for their use and adaptability was needed as confirmed by the TOES instrument designer, Anita Bundy, at [anita.bundy@colostate.edu](mailto:anita.bundy@colostate.edu). These play assessments can be found within the 'Play in Occupational Therapy for Children 2<sup>nd</sup> Edition' textbook published by L. Diane Parham and Linda S. Fazio (Parham and Fazio, 2009).

### **1.3.8 Data management**

#### **1.3.8.1 Managing and Storing Data**

All data collected through the online Redcap® platform were safely and securely stored in the data management portal on the Redcap® website. According to the Redcap® platform guidelines, personal information and data are managed and stored safely and securely according to the Protection of Personal Information Act (POPIA). All hard copies that were printed and completed in-person at on-site visits were loaded onto the Redcap® system within a week of data collection so that these data were also stored safely and securely online. All hard copies after being loaded onto Redcap® have continued to be safely stored in a locked storage cabinet for the duration of the research period.

#### **1.3.8.2 Backing Up Data and Data Preservation**

The data for this research collection therefore sufficiently backed up with sufficient online storage using the online Redcap® platform. These online data will be maintained on the Redcap® system until the completion of this research study. It will be protected safely according to the Redcap® guidelines under the partnership of the University of the Witwatersrand with Redcap® for research. All photographs were saved on a secure online drive (Google) for the duration of the study.

#### **1.3.8.3 Data Security and Confidentiality**

Redcap® is a safe university database with effective firewalls, and thus has safe storage of the data collected. Redcap® ensures data security and confidentiality of the information obtained from the research participants using the personalised settings on the Redcap system for this research study. Each research participant is given a number count to determine the status of completion of the research, i.e. totally completed, partially completed, and incomplete to the invited research participants.

Names or email addresses are not assigned to completed research surveys and therefore confidentiality of the ECD centres completing the research questionnaire using the Redcap system was ensured.

#### 1.3.8.4 Data Sharing and Access

The researcher had to give access to the self-developed online Redcap® research questionnaire. The researcher's log-in details were only shared with the researcher's supervisors who were able to log in only for research support purposes with data collection and analysis. Redcap® support teams were able to access the research questionnaire only with permission of the researcher when support was needed with the questionnaire, such as participants' difficulties with loading photographs onto the questionnaire or editing certain settings, such as the time frame for the research survey to allow more time for completion or for additional research participants to be invited for participation.

#### 1.3.9 Data analysis

Microsoft Excel (version 2403) was used to organise the raw quantitative data. Microsoft Excel statistical functions, using both descriptive and inferential statistical operations, were used for the development of graphs and tables to illustrate the data and answer the research aims and objectives.

The raw quantitative data was downloaded directly from the Redcap® online platform. Quantitative data were directly separated into the two-control independent variable groups, being the low socioeconomic group and the high socioeconomic group, to create a foundation for the data analysis within this descriptive comparative study.

The data was then analysed according to the components of the questionnaire that outline different themes that would help answer the research objectives. Statistica software (14.0.1) was explored as a possibility to be used. However, for this data analysis and research study, the researcher chose Microsoft Excel (version 2403) as the preferred data analysis platform with the help of a statistical support from an experienced statistician, especially for inferential statistics that would be appropriate for the comparative aspect of this research study between control independent variables and their varying associations and correlation strengths between the independent variable (socioeconomic status) and the dependent variables (information about the outdoor play space at the ECD centre).

Frequencies and percentages were used to describe all components A (Demographics within ECD centre outdoor play space/s), B (Type of outdoor play space/s, play space

equipment and resources), C (Other physical characteristics of outdoor play space/s), and D (Subjective view of the outdoor play space/s) using descriptive statistics. In cases where there were many category options where research participants were able to select more than one category, additional frequencies and percentages were created to analyse the total count of how many categories each ECD centre selected, e.g., in Component B (Type of outdoor play space/s, play space equipment and resources), how many pieces of manufactured playground equipment that were available in addition to the types of manufactured playground equipment that were available.

Inferential statistics were used to analyse Components B (Type of outdoor play space/s, play space equipment and resources), C (Other physical characteristics of outdoor play space/s), and D (Subjective view of the outdoor play space/s) to make inferences about how the sample size statistics could represent the actual total population. Chi-squared tests of independence were, therefore, used to measure the strength of the relationship between nominal variables, i.e. between socioeconomic status and outdoor play space information. The Cramer's V correlation test was then used to measure the association strength between the two nominal variables, specifically for the nominal categorical variables and not the ordinal categorical variables. After consultation with the statistician, relevant literature and alignment with the research objectives, the Chi-squared and Cramer's V inferential statistics were chosen to make relevant inferences about the relationship between nominal variables being tested in this study (McHugh, 2013; Chua, 2018).

Qualitative data obtained in the research questionnaire "if other, please describe" questions were quantified using thematic content analysis for each of the four main questionnaire components to supplement the primary quantitative data analysis. Photographic evidence supplemented the quantitative data.

**Table 1.2. Data Analysis Outline**

| <b>Research Objectives</b><br>1) To determine the physical design and availability of equipment within the outdoor play spaces in early childhood development centres in low socioeconomic environments.<br>2) To determine the physical design and availability of equipment within the outdoor play spaces in early childhood development centres in high socioeconomic environments<br>3) To compare (similarities and differences) the physical design and availability of equipment within outdoor play spaces in early childhood development centres in low and high socioeconomic environments. |                                  |                                                                                                              |                                                                            |                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Questionnaire Component</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Quantitative/ Qualitative</b> | <b>Type of data</b>                                                                                          | <b>Variables</b>                                                           | <b>Type of analysis</b>                                                                                                                                                                                         |
| <b>Component A:</b><br>Demographics within ECD centre outdoor play space/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Quantitative                     | Nominal Categorical (e.g. yes/no)<br><br>Ordinal Categorical (e.g. how many children, how many classes)      | Independent (S ES) versus Dependant (Information about Outdoor Play Space) | <b>Descriptive:</b><br>Frequencies, percentages, mode, mean, range<br><br><b>Content Analysis</b>                                                                                                               |
| <b>Component B:</b><br>Type of outdoor play space/s, play space equipment and resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Quantitative                     | Nominal Categorical (e.g. type of playground)<br><br>Ordinal Categorical (e.g. count of pieces of equipment) | Independent (S ES) versus Dependant (Information about Outdoor Play Space) | <b>Descriptive:</b><br>Frequencies, percentages<br><br><b>Inferential:</b><br>Chi-square test of independence<br>Cramer's V correlation test (for nominal categorical variables)<br><br><b>Content Analysis</b> |
| <b>Component C:</b><br>Other physical characteristics of outdoor play space/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Quantitative                     | Nominal Categorical (e.g. type of terrain)<br><br>Ordinal Categorical (e.g. count, size, height)             | Independent (S ES) versus Dependant (Information about Outdoor Play Space) | <b>Descriptive:</b><br>Frequencies, percentages<br><br><b>Inferential:</b><br>Chi-square test of independence<br>Cramer's V correlation test (for nominal categorical variables)<br><br><b>Content Analysis</b> |
| <b>Component D:</b><br>Subjective view of the outdoor play space/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Quantitative                     | Nominal Categorical (ALL questions)                                                                          | Independent (S ES) versus Dependant (Information about Outdoor Play Space) | <b>Descriptive:</b><br>Frequencies, percentages<br><br><b>Inferential:</b><br>Chi-square test of independence<br>Cramer's V correlation test<br><br><b>Content Analysis</b>                                     |

### 1.3.10 Ethical considerations

An ethics clearance certificate (M200956) was obtained from the Human Research Ethics Committee (Medical) at the University of the Witwatersrand. The following ethical considerations have been ensured in this study.

#### **Informed consent:**

An information letter (Appendix D) formed the front page of the final online Redcap questionnaire for data collection (Appendix K), as well as the introductory letter in the body of the email sent to all research participants. This included information on the title of the research, the objective and objectives of the research, the purpose of the study for future use in South African ECD centres and the playground intervention, as well as contact details for further information about the study. Once reading this front page, research participants were able to use this information to choose whether to participate in the study by selecting or not selecting the 'start research survey' icon. Furthermore, once participants read the second-page highlighting inclusion criteria, research participants could determine if they were an appropriate participant for the study by selecting 'yes' or 'no'. Informed consent was therefore implemented once participants willingly continued to complete the online Redcap questionnaire with the information they had received. Permission for photographs, as well as permission for ECD centre visitation permission, was also included as Component E in the questionnaire (both online and printed hard copy versions). The information letter (Appendix C) and the informed consent form (Appendix D) were also printed out for all research participants who completed the questionnaire with the research at in-person on-site ECD centre visits.

#### **Confidentiality:**

The self-developed online questionnaire on the Redcap survey system was confidential throughout the data collection process. This ensured confidentiality for all ECD centres so that the names and identities of the centres and specific data from each centre were confidential and shared only with the researcher, research supervisors, and Redcap support teams temporarily. The ECD centres have been informed that they can have access to the research results if they request this once the study has been completed.

#### **Non-maleficence:**

The head teachers or principals of the ECD centres were informed of their ethical rights to decline participation at any time, about their autonomy and confidentiality and that refusing to participate or withdrawing from the study would have no consequences. This was stipulated in the information letter provided on the email body, the front page of the online

Redcap questionnaire, and the front page of the hard copy version of the questionnaire. The information letter also included assurance that the research study would in no way put a participant at risk or in harm's way, that all aspects of the study had been explored to ensure this, and that participation in the study was voluntary. It was stipulated that refusal to participate or withdraw participation would not involve penalties or repercussions.

### 1.3.11 Rigour of research

#### **Validity:**

Before data collection, ethical approval at the University of the Witwatersrand was obtained and permission from the Department of Basic Education. A content validity questionnaire was also sent to five experts in the fields of outdoor play spaces, early intervention, and paediatric occupational therapy which was analysed, and further corrections were made to the self-developed research questionnaire. This research study reduced the margin of error by ensuring a sufficient total population sample size of ECD centres was used. The raw research data was also checked for a second opinion by the research supervisors for improved validity from experts in the research field. Data analysis for quantitative data was regularly checked for accuracy and precision, as well as a second opinion by an experienced statistician for increased validity.

#### **Bias:**

Bias can occur within a variety of phases of the research process, including planning, data collection, data analysis, data interpretation, or publication, and therefore it is important to ensure that bias is identified and avoided in research to ensure valid and unbiased research (Šimundić, 2013). Researcher planning and data collection bias was eliminated by the rigorous checking and approval process described above, as well as ensuring the questions in the research questionnaire achieved content validity. This aimed to ensure that the pre-planned questions and language were more easily understandable for principals or head teachers to complete this to the best of their ability. For research questionnaires completed telephonically or during in-person on-site ECD centre visits with the principals or head teachers, the researcher verbally carried out the questions in the same way as they were written and provided a further explanation of the question in the same way at each centre, if required. The same researcher carried out all research which eliminated inter-researcher bias. Data analysis bias was avoided through the rigorous checking process with experts regarding the types of statistical tests to use for appropriate data interpretation that were relevant and meaningful to answer the previously planned research objectives prior to the study.

## CHAPTER 2: SUBMISSIBLE MANUSCRIPT

### Manuscript Details

The Early Childhood Education Journal has been chosen to submit this research study toward. Many of this study's references accessed through the literature review and research planning process were accessed through this international professional publication via the Springer Link research portal. This journal aims to publish original peer-reviewed articles within the developing early childhood education field that exemplify an integration of three distinguishing facets representing the evidence and best practices within the early childhood education context (Springer Nature, 2024). Firstly, theory, research, and practice; secondly, reviews of early childhood programs worldwide representing excellence and development in the field; and finally, a variety of research forms, including quantitative, qualitative, and mixed methods (Springer Nature, 2024). The aims and scope of the journal are interested in studies from a wide variety of professionals working within the early childhood education field including those with education, health, psychological, medical, or social backgrounds where diverse early learning settings internationally and across multiple domains is encouraged (Springer Nature, 2024).

This descriptive research study which used predominantly quantitative data that was supplemented with qualitative data, was carried out by a paediatric Occupational Therapist exploring the field of early childhood development and specifically outdoor play spaces in low and high socioeconomic status ECD centres in the developing country of South Africa. Therefore, this original research report is a suitable fit to be submitted to the Early Childhood Educational Journal for publication as appropriately suits the journal's aims and scope guidelines. The Early Childhood Educational Journal is also located on the 2023 list of accredited journals on the University of the Witwatersrand database. Therefore, it is also appropriate for the submission of a submissible format research report in partial fulfilment of the requirements of a Master of Science degree in Occupational Therapy at the University of the Witwatersrand.

## Title Page

### Title of Original Paper/ Journal Article

The comparison between outdoor play spaces, equipment, and resources in low versus high socioeconomic Johannesburg early childhood development centres.

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|-------------------------------------------|---------------|----------------------|--------------|
| Conceptualization                         | X             | X                    | X            |
| Methodology                               | X             | X                    | X            |
| Formal analysis                           | X             | X                    | X            |
| Investigation                             | X             |                      |              |
| Resources                                 | X             | X                    | X            |
| Data curation                             | X             | X                    | X            |
| Writing manuscript- draft                 | X             |                      |              |
| Writing manuscript- reviewing and editing | X             | X                    | X            |
| Supervision                               |               | X                    | X            |

## Abstract

Play spaces facilitate play as a child's primary occupation which is essential for learning and early childhood development. In South African early childhood development centres, almost 11% do not have access to outdoor play areas, 20% have no outdoor play equipment, and 50% have no access to educational toys (Statistics South Africa, 2016). This research aimed to compare the physical design and resources in low socioeconomic (LSE) versus high socioeconomic (HSE) early childhood development (ECD) centres in Johannesburg. A descriptive comparative research design was used, with a total population sampling method for the distribution of a self-developed questionnaire adapted from play literature. Results were obtained from a total sample size of 82 ECD centres, 28 reported LSE and 54 reported HSE. Quantitative data was analysed using descriptive and inferential statistics. LSE-ECD centres (57% community-based sites) had significantly less funding frequency compared to HSE-ECD centres (83% independent / private schools), with 87% private funding at least annually for outdoor play space upkeep. LSE-ECD centres had limited outdoor play space resource variety and quantity (7% had no outdoor play space, 43% had traditional playground designs, 14% had no fixed playground equipment), compared to HSE-ECD centres with a wide variety and abundance of outdoor play space resources. Chi-squared statistics revealed a significantly higher number of fixed and loose manufactured equipment, movement toys, fixed and loose natural resources, and multi-sensory exploration spaces in HSE-ECD centres. Cramer's V statistics revealed outdoor play space physical design and resource availability have a strong dependence on socioeconomic status.

**Keywords:** Outdoor play space, early childhood development, socioeconomic status, physical design, equipment, resource availability.

## Statements and Declarations

**Competing interests:** The author does not have any competing or conflicts of interest, whether financial or non-financial) that relate to this research report being submitted for publication. Therefore, there are no conflicts of interest that may impart bias on this research. **Funding:** The author did not receive financial support from any funding agency in the public, commercial, or non-profit sectors. **Data availability:** The raw data are not publicly available for this study. **Disclaimer:** The views and opinions expressed in this article are those of the authors and do not necessarily reflect the position of any affiliated institution of the authors.

## Introduction

Occupational therapists play a pivotal role in child development and play as an occupation and can advocate for the use of play spaces to prevent play deprivation (Bundy et al., 2008; Parham, 2009; Lynch & Moore, 2016). The role of occupational therapists in the advocacy for social inclusion of all children through the accessibility and usability of their play spaces and the prevention of environmental, financial, or social barriers has been highlighted in the literature (Moore, Boyle & Lynch, 2023). Play is considered a vital primary occupation for children and a fundamental aspect of childhood (Parham, 2009; United Nations Convention on the Rights of the Child [UNCRC], 2013). Play plays a role in biological, social, cognitive, emotional, sensory, and physical development, as well as overall health and well-being of a child (International Play Association [IPA], 2014; UNCRC, 2013).

The transactional relationships between an individual and the environment and the importance of the quality of the individual-environment goodness of fit is frequently highlighted in occupational science literature, as well as more specifically in the environmental supportiveness of play (Bronson & Bundy, 2001; Hamm, 2006; Bundy, Waugh & Brentnall, 2009; Guichard, Coelho & Grande, 2023). The transactional relationship between a child's genes, brain, body, behaviour, and physical and social environment is crucial for understanding the fundamental contributions that play has on the overall health, development, and well-being of a child (Lester & Russell, 2008, 2010).

## Review of the Literature

Despite the importance and significance of play for child development, there is a growing concern of play deprivation worldwide, as well as a global decline in outdoor play. Research literature indicates that reasons for the global decline in outdoor play include a culture of fear in an unsafe world, urbanisation, screen-time, lack of space or access to space, working parents, time constraints, physical safety on the playground, parental fear of risky play, decreased sense of community, transportation limitations, dirt, parenting styles, overprotection, neighbourhood poverty, and a push by education systems for education in place of play (Allin, West & Curry, 2014; Holt et al., 2015; McClintic & Petty, 2015; Reimers et al., 2018; Tovey, 2019; Kepper et al., 2020; Cheng et al., 2022; Visser & van Aalst, 2022; Akdemir, Banko-Bal & Sevimli-Celik, 2023). Research to date on play deprivation has highlighted significant disturbances in child mental health and emotional well-being, increasing likelihood of violence and aggression, increasing risks of obesity

and other poor physical health concerns, poor social skills, and ultimately less healthy lifestyles as adults in society (IPA, 2014).

Play spaces add to the development of play skills (Skard & Bundy, 2008; Parham & Fazio, 2009). The IPA (2016) suggests how the physical environment plays a role in shaping play opportunities and play quality through the appropriate provision of space and time for play. These can facilitate further positive drive for play and development of play skills (Yogman et al., 2018), or negatively through environmental exposure to poor quality conditions and risks detrimental to children's physical health or safety which can cause reduced play motivation and play skills (Johnson et al., 2015). There has been extensive research globally on outdoor play space development, design, and playgrounds (Luchs & Fikus, 2013; Olsen & Smith, 2017; Simoncini & Lasen, 2021). Outdoor play spaces have evolved worldwide with regard to the beneficial addition of loose or moveable materials, such as recycled materials, having creative or adventure playgrounds versus traditional playgrounds, incorporating semi-private spaces and having design principles following children's natural characteristics of play, which have all been proven to improve creativity, variety and flexibility, social skills and communication, and positive affect (Maxwell, Mitchell & Evans, 2008; Kemple et al., 2016; Frost & Sutterby, 2017; Engelen et al., 2018; Dobbins et al., 2020). Outdoor play spaces are often designed with developmental characteristics in mind and may include sand-filled areas, climbing structures, moveable materials such as swings, recycled materials, and areas to improve creativity, variety and flexibility, social skills and communication (Engelen et al., 2018; Cohen et al., 2023). Lack of access to outdoor play spaces, equipment, resources, or play opportunities can lead to play deprivation and can affect a child's overall development, health, and well-being (IPA, 2016). Low socioeconomic environments, in particular, have been shown to have less access to outdoor play spaces and resources (Cronin-De-Chavez, Islam & Mceachan, 2019). A variety of international studies have explored promising initiatives in implementing new and / or upgrading current outdoor spaces in communities to encourage further outdoor play and physical activity in children (Quigg et al., 2012; Mölenberg et al., 2019; Schlesinger & Hirsh-Pasek, 2019; Moore, Boyle & Lynch, 2023; Morgenthaler et al., 2023).

Statistics South Africa (2024a) indicates that the proportion of households in the city of Johannesburg, South Africa, who perceived themselves as poor increased from 18.1% in 2019 to 21.9% in 2022. The results further showed that 7,2 million children aged 0-6 years in South Africa, which comprised 66.4% of the total child population in Gauteng,

attended ECD centres (Statistics South Africa, 2024b). However, 11% of ECD centres on a national level did not have access to outdoor play areas, 20% did not have access to outdoor play equipment such as jungle gyms, and 50% did not have access to educational toys (Statistics South Africa, 2016). It has been reported that the large number of children enrolled in ECD centres in South Africa, as well as the lack of resources and infrastructure, have a significantly negative influence on the way children can play in the play spaces in ECD centres, which poses a challenge for ECD teachers (South Africa, 2016; Statistics South Africa, 2024b; Van Heerden, 2016; Aubrey, 2017; Labantwana, 2019; Phajane, 2019; Madyibi & Bayat, 2021; Pretorius & Heerden, 2021; Aina & Bipath, 2022). Literature has indicated that the socioeconomic status of children impacted the quality of their play with toys (Trawick-Smith et al., 2015) and that children from low-income South African preschools spent more time indoors than outdoors compared to children in high-income preschools (Jones, Hendricks & Draper, 2014). Educational settings with a lower socioeconomic status more frequently had a lack of early learning resources, decreased value placed on early learning, increased crime, as well as a shortage of community programmes and infrastructure (Draper et al., 2023). Adams, Savahl, and Fattore (2017) described how despite South Africa's substantial gains made in the advocacy of children's rights through policies and legislature, there has been little or no implementation into safer environments for children in their daily lives. Savahl, Adams and Hoosen (2023) further reinforced the impact of this lack of practical implementation on the general well-being of South African children. Non-governmental and non-profit organisations in South Africa are currently trying to make an impact on South African outdoor play spaces and play initiatives. A current Occupational Therapy driven South African community playground initiative, Sensory Spaces, has been developed to address play and sensory integration difficulties in children living in disadvantaged communities. Sensory Spaces achieved improvement in foundation phase learners sensory-motor development through community stimulation programmes using low-cost sustainable playgrounds developed and custom-designed based on Ayres Sensory Integration® principles (van Jaarsveld et al., 2021).

There was a significant lack of research literature in South Africa on the current physical design of outdoor play spaces, availability of equipment, and specific play resources within the outdoor play spaces in ECD centres, in both LSE and HSE environments. The basic information provided above by Statistics South Africa (2016) is some of the only formal evidence found in South Africa on what the LSE and HSE-ECD centre outdoor play spaces look like. The South African literature on outdoor play space

reflects primarily that of an educator's subjective views of playground designs and their impact on sensorimotor development, or on the challenges experienced by educators in LSE-ECD centres (Nel, Joubert & Hartell, 2017; Visser et al., 2021). We know that access and opportunity to outdoor play space, equipment and resources for children aged 0 to 6 years in South Africa is significantly impacted by contextual affordances or constraints, such as socioeconomic status as defined by average household income quintiles (Statistics South Africa, 2024a). The absence of research literature on outdoor play spaces in ECD centres has negative consequences for South African outdoor play space policymakers, funders and educators within early childhood education. This gap in the research also has negatively implications for future practice in outdoor play space design, implementation, improvements and maintenance within the ECD space in South Africa. This study could address this gap by contributing valuable data and insights to inform future policies, funding, and practice within the early education and playground development in South Africa.

In addition, there is also a lack of research literature that outlines the comparison between the availability of outdoor play spaces, equipment, and resources in HSE environments compared to LSE environments in South Africa. Therefore, this study aims to investigate these similarities and differences based on socioeconomic status, to bridge this gap in the literature. This aims to supplement the policies and practice for outdoor play spaces in both LSE and HSE-ECD centres to further help improve all children's play participation, exploration, and development in South Africa. These outcomes will support the primary goal of occupational therapy, that is; to help individuals and communities develop meaningful and purposeful ways to engage in their environments. Implementing play policies and creating or improving play spaces would be in line with the Sustainable Development Goals for 2030, as well as for the provision of health-promoting schools (World Health Organization, 2018). Reinforcing the need to create opportunities for children to access natural environments for outdoor play spaces should be part of the solution to address health and education inequalities in South Africa (Department of Education, 2001; Statistics South Africa, 2016; Statistics South Africa, 2024a; Statistics South Africa 2024b; Department of Basic Education, 2018).

## Methodology

### Study design

A descriptive quantitative survey study design was used to determine and compare the physical design, equipment, and resources of the outdoor play spaces in low versus high socioeconomic ECD centres in Johannesburg.

### Population and sampling

The research participants included educators who were able to provide information about the respective ECD centre's outdoor play space/s in Johannesburg, South Africa. A total sampling method was used (Bhardwaj, 2019). A sample size of a minimum of 60 ECD centres, a minimum of 30 from the low socioeconomic (LSE) ECD centres and a minimum of 30 from the high socioeconomic (HSE) ECD centres were needed for a 5% margin of error as recommended by Cochran's formula (Bartlett, Kotlik & Higgins, 2001). The final sample size included a total of 82 ECD centres, with 28 representing the LSE-ECD centres and 54 representing the HSE-ECD centres. The research participant should be the principal or head teacher at a registered ECD centre for children aged 6 months to 6 years in the Johannesburg region. ECD centres were chosen from a list provided by the Department of Basic Education. The list states schools and ECD centres under different quintiles where a quintile 1 school is a non-fee-paying school (low socioeconomic school) and quintiles 4 & 5 as fee-paying schools (high socioeconomic schools).

### Research Instrument

A questionnaire was designed by the researcher based on relevant outdoor play space literature and play assessments. A content validity study was performed using five professional experts in the field of early intervention and/ or outdoor play spaces via an online RedCap® content validity questionnaire. The results from this study's content validity analysis from five experts indicated I-CVI between 0.8 and 1.0 in the categories of relevance, clarity, simplicity, and ambiguity. Questions with an I-CVI score of 0.8 were adjusted according to the expert's recommendations.

### Research Procedure

After ethical clearance (M200956) was obtained from the Human Research Ethics Committee (Medical) of the University and approval from the Gauteng Department of Education was given, ECD centres were identified for inclusion in the study. This included the use of database lists or other research methods to access the contact details of the

Johannesburg ECD centres. An information letter was provided to all participants detailing the objectives and purpose of the study for them to provide informed consent. Once informed consent was obtained after a detailed information letter was read and inclusion was confirmed according to inclusion criteria, the educator could continue with the completion of the questionnaire. The questionnaire was completed through the online Redcap link via email, SMS or WhatsApp, as well as telephonically with the researcher and in person with the researcher on visits to the Johannesburg ECD centres.

## Data analysis

Raw quantitative data was analysed using both descriptive and inferential operations according to demographics, physical design, and play space equipment and resources. Chi-squared tests of independence were used to measure the significant difference in outdoor play space information between low and high socioeconomic ECD centres.

## Results

### Demographics

**Table 1** ECD Centre Demographics

|                              |                                                    | Total | LSE-ECD<br>(n) | LSE-ECD<br>(%) | HSE-ECD<br>(n) | HSE-ECD<br>(%) |
|------------------------------|----------------------------------------------------|-------|----------------|----------------|----------------|----------------|
| <b>Number of ECD centres</b> |                                                    | 82    | 28             | 34%            | 54             | 66%            |
| <b>ECD centre category</b>   | Independent/ private school                        | 51    | 6              | 21%            | 45             | 83%            |
|                              | Community-based site                               | 22    | 16             | 57%            | 6              | 11%            |
|                              | Independent/ private school & Community-based site | 2     | 2              | 7%             | 0              | 0%             |
|                              | Other/ combinations                                | 7     | 4              | 16%            | 3              | 6%             |
| <b>Funding type</b>          | Privately funded                                   | 53    | 6              | 21%            | 47             | 87%            |
|                              | Government funded (quintile 1)                     | 11    | 7              | 25%            | 4              | 7%             |
|                              | Charity/ NGO/ NPO (quintile 1)                     | 8     | 6              | 21%            | 2              | 4%             |
|                              | Other                                              | 10    | 9              | 32%            | 1              | 2%             |

The total sample size was 82 ECD centres in Johannesburg, with 28 (34%) reportedly LSE-ECD and 54 (66%) reportedly HSE-ECD. 57% of LSE-ECD centres were found to be community-based sites. 83% of HSE-ECD centres were found to be

independent / private schools. LSE-ECD centres received funding less frequently from many sources including private, government, charity, or others, whereas HSE-ECD centres predominantly were consistently funded privately.

## Physical design of outdoor play spaces and playground structural materials in ECD centres

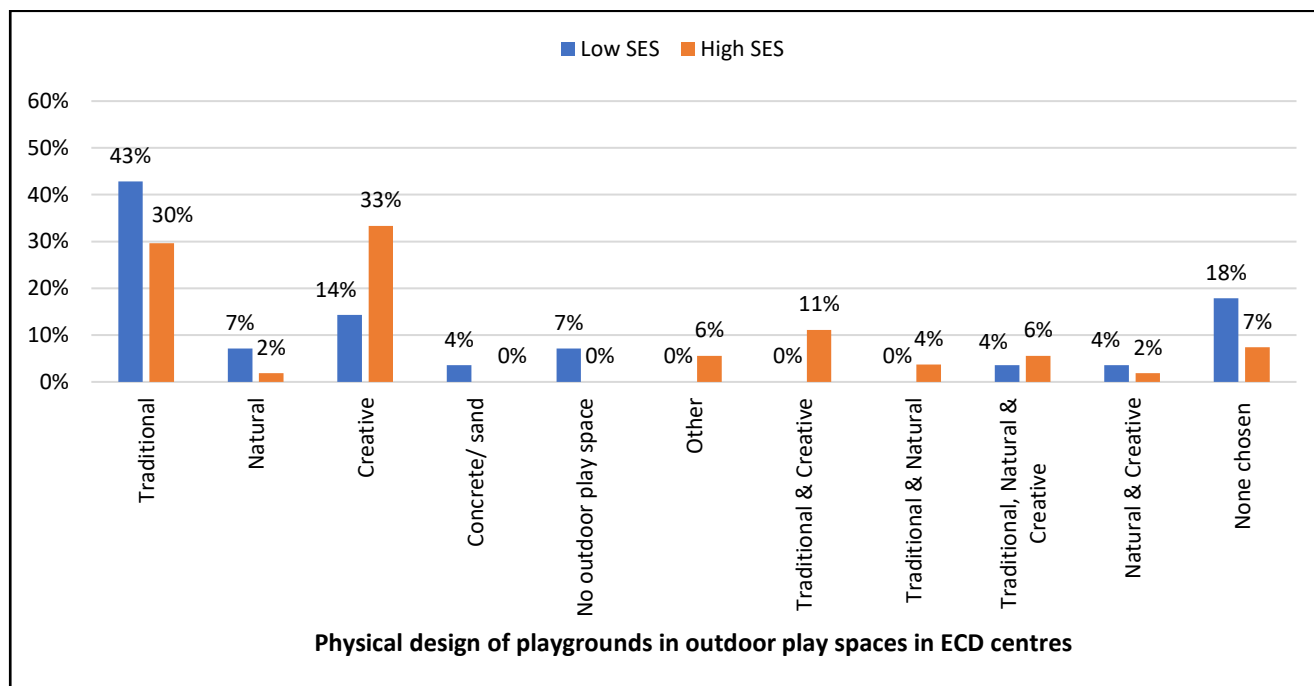


**Fig 1** Physical design of outdoor play spaces

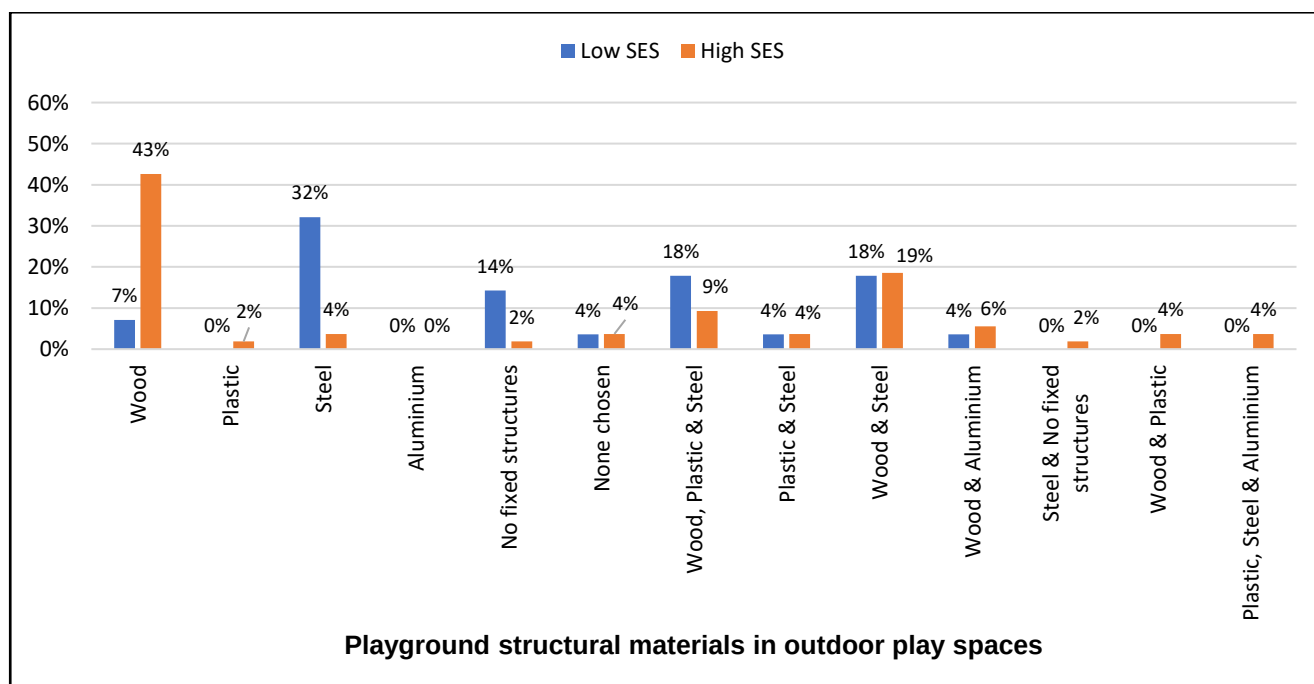


**Fig 2** Playground structural materials in outdoor play spaces

Traditional playgrounds were more frequent in LSE-ECD centres compared to the relatively even distribution of creative playgrounds and traditional playgrounds that were described in HSE-ECD centre outdoor play space/s (Figure 1). Other descriptions found the additional pieces of equipment that formed part of the playground, including a steel car, assorted equipment that was brought out on different days, and a small, paved area with some grass.

Figure 2 reflects that higher percentages of HSE-ECD centres have the following playground structural materials: wood (43%), wood and steel (19%), wood and aluminium (6%), wood and plastic (4%), and plastic, steel and aluminium (4%). Similar percentages of HSE-ECD (4%) and LSE-ECD (4%) centres have plastic and steel structural materials. The only type of playground structural materials which a considerably higher percentage of LSE-ECD centres (32%) have, compared to HSE-ECD centres (4%), is steel. In addition, 14% of LSE-ECD centres have none of the above-mentioned playground structural materials, in stark contrast with HSE-ECD centres of which only 2% have no playground structural materials.

### Types and total count of manufactured equipment, materials, and toys in outdoor play spaces in ECD centres

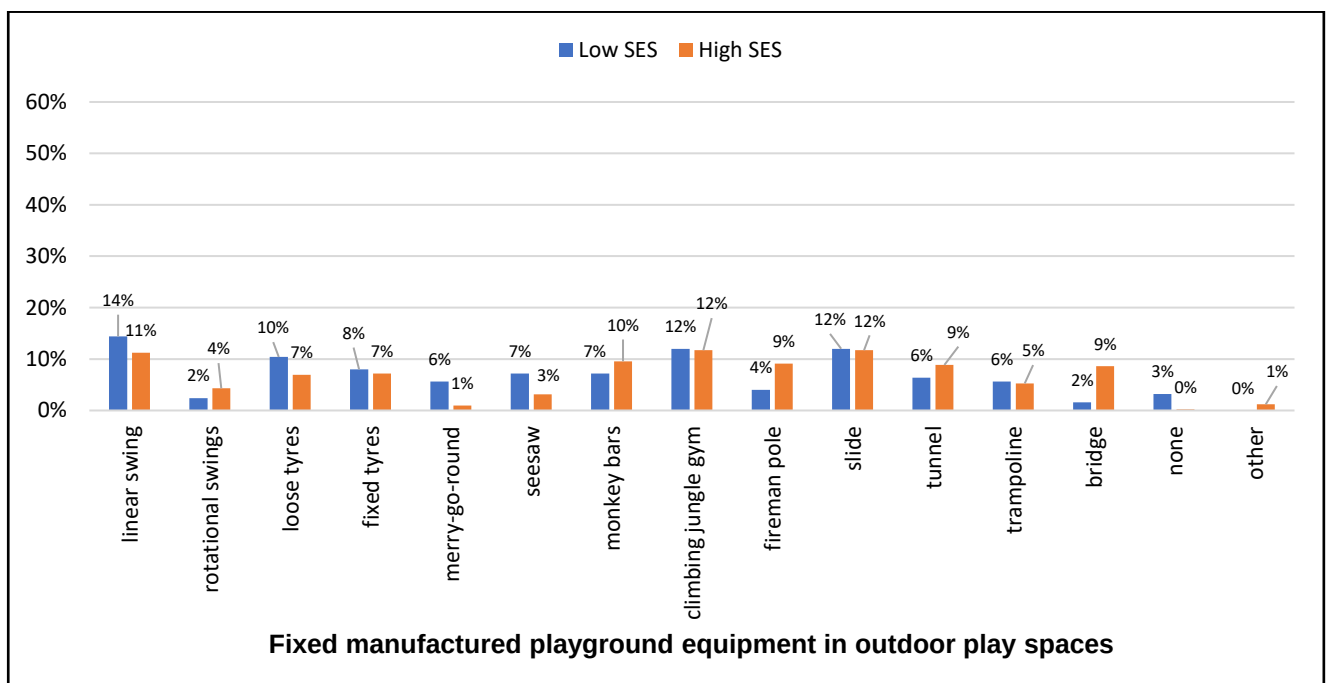


**Fig 3** Total count of fixed manufactured equipment

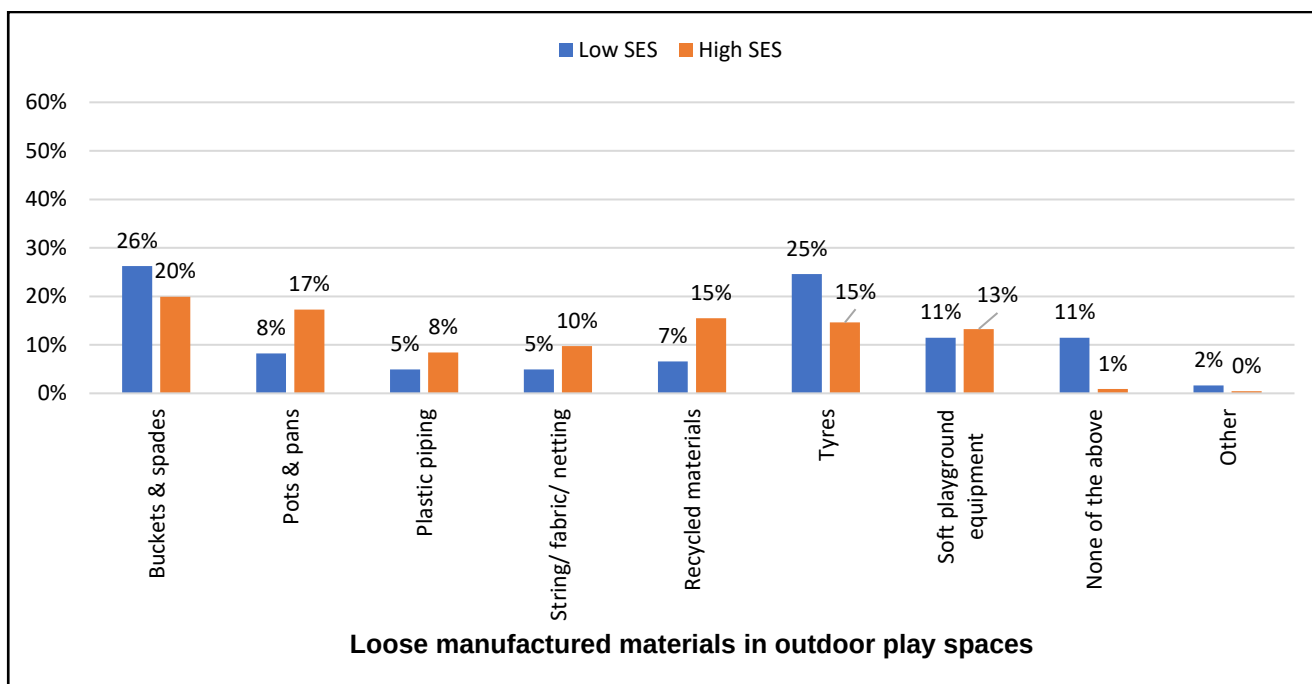


**Fig 4** Types of loose manufactured materials

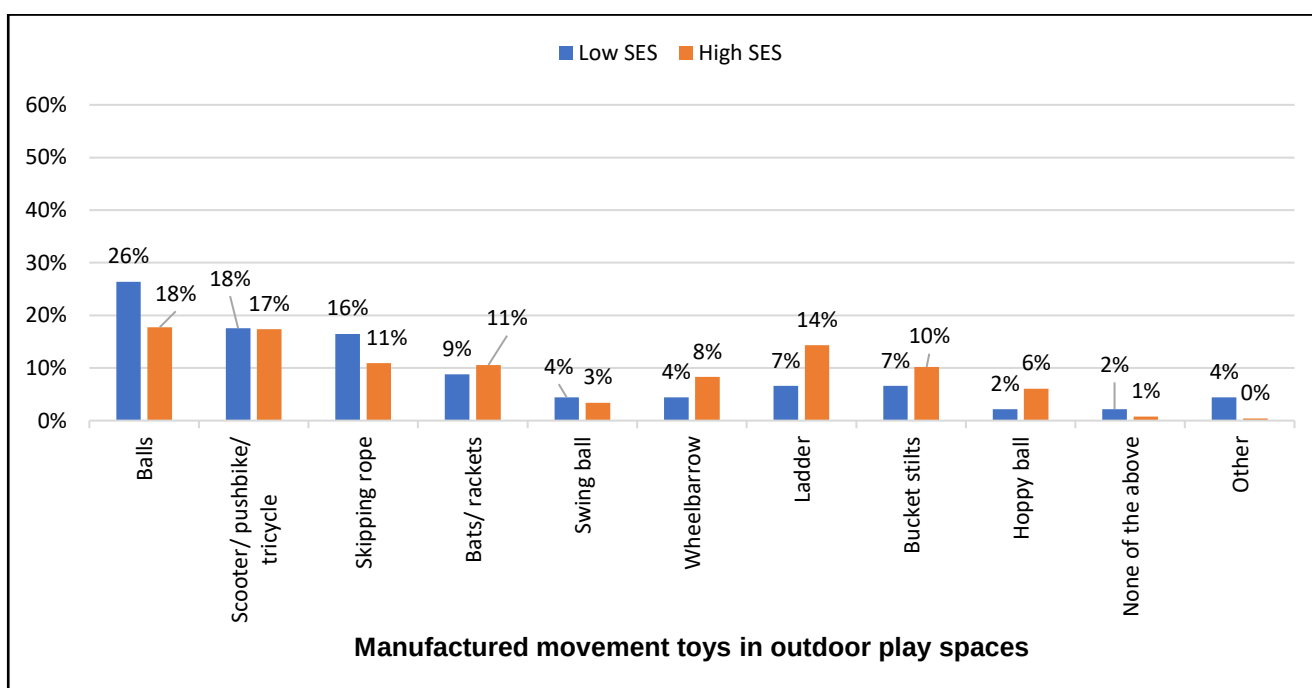


**Fig 5** Types of manufactured movement toys

### ***Fixed manufactured equipment***

Figure 3 reflects that higher percentages of HSE-ECD centres have the following fixed manufactured playground equipment: monkey bars (10%), fireman poles (9%), tunnels (9%), and bridges (9%). Similar percentages of HSE-ECD and LSE-ECD centres have fixed tyres, climbing jungle gyms, slides, and trampolines. The types of fixed manufactured playground equipment which a considerably higher percentage of LSE-ECD

centres have, is linear swings (14%), loose tyres (10%), merry-go-rounds (6%) and seesaws (7%). In addition, 3% of LSE-ECD centres have none of the above-mentioned fixed manufactured playground equipment, in contrast with HSE-ECD centres of which 0% have no fixed manufactured playground equipment. Other manufactured playground equipment included a rock-climbing wall, ninja rope, merry-go-round, seesaw, monkey bars, fireman pole, tunnel, trampoline, balancing beam, and a mini-zipline.

There was a significant difference between the LSE-ECD centres and HSE-ECD centres for the number of fixed manufactured equipment (Chi squared=25.65, DF=12,  $p=0.0012$ ). Most LSE-ECD centres had six to seven pieces of fixed manufactured equipment while this was eight to eleven pieces in the HSE-ECD centres.

### ***Loose manufactured materials***

Figure 4 reflects that higher percentages of HSE-ECD centres have the following loose manufactured materials: pots and pans (17%), plastic piping (8%), string / fabric / netting (10%), and recycled materials (15%). Similar percentages of HSE-ECD (13%) and LSE-ECD centres (11%) have soft playground equipment. The only types of loose manufactured materials which a considerably higher percentage of LSE-ECD centres have, is buckets and spades (26%) and tyres (25%). In addition, 11% of LSE-ECD centres have none of the above-mentioned loose manufactured materials, in stark contrast with HSE-ECD centres of which only 1% have no loose manufactured materials.

HSE-ECD centres were found to have more variety such as pots and pans, plastic piping, string/ fabric/ netting, recycled materials, tyres, and soft playground equipment (e.g. blocks, half-moons, wedges). The total count of loose manufactured materials was significantly higher at the HSE-ECD centres. (Chi squared=61.79, DF=6,  $p=0.0001$ ).

### ***Manufactured movement toys***

Figure 5 reflects that higher percentages of HSE-ECD centres have the following manufactured movement toys: bats / rackets (11%), wheelbarrows (8%), ladders (14%), bucket stilts (10%), and hoppy ball (6%). Similar proportions of HSE-ECD (17%) and LSE-ECD (18%) centres have scooter / pushbike / tricycle. The only types of manufactured movement toys which a considerably higher proportion of LSE-ECD centres have are balls (26%) and skipping ropes (16%). In addition, 2% of LSE-ECD centres have none of the above-mentioned manufactured movement toys, with HSE-ECD centres of which only 1% have no manufactured movement toys.

It was also found that HSE-ECD centres have more types of movement toys which included wagons, wheelbarrows, bucket stilts hoppy balls, and hula-hoops. Overall, most LSE-ECD centres were found to have three or fewer types of manufactured movement toys, compared to HSE-ECD centres with four or more. The HSE-ECD centres had significantly more manufactured movement toys (Chi squared=55.91, DF=8, p=0.0001).

### Types and total count of natural resources, materials, and multi-sensory exploration spaces in outdoor play spaces in ECD centres

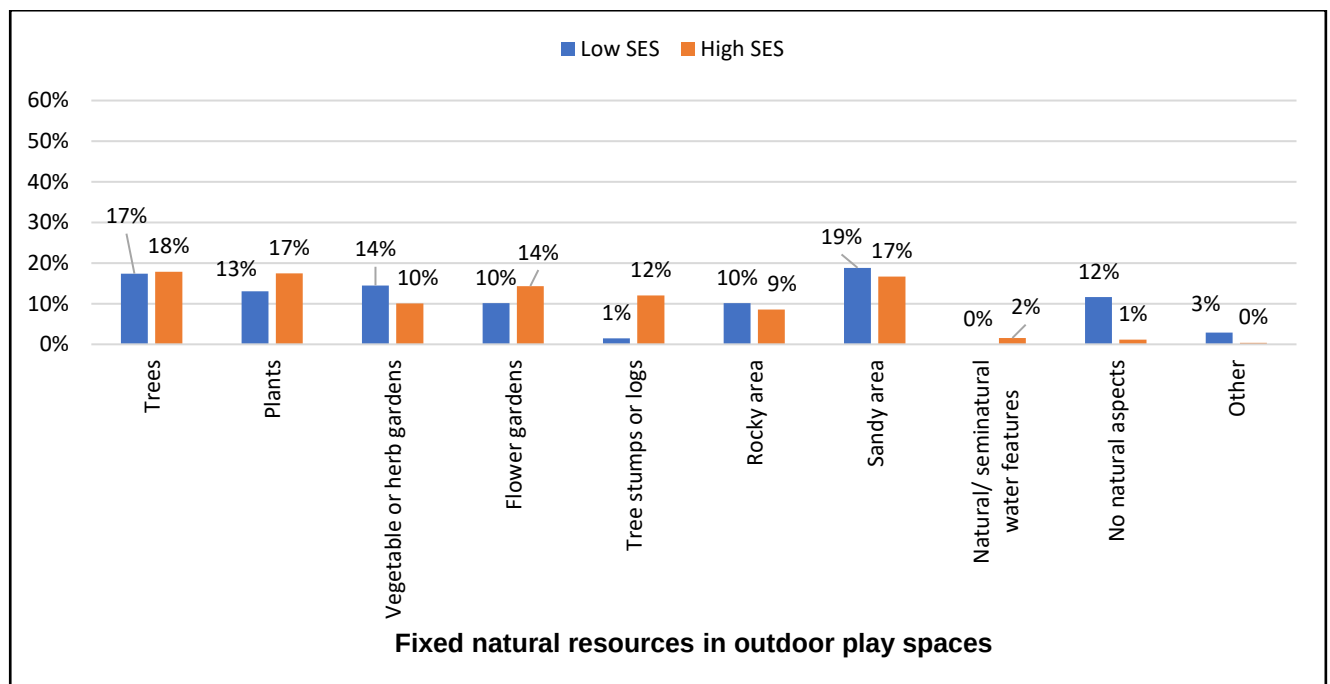


**Fig 6** Types of fixed natural resources

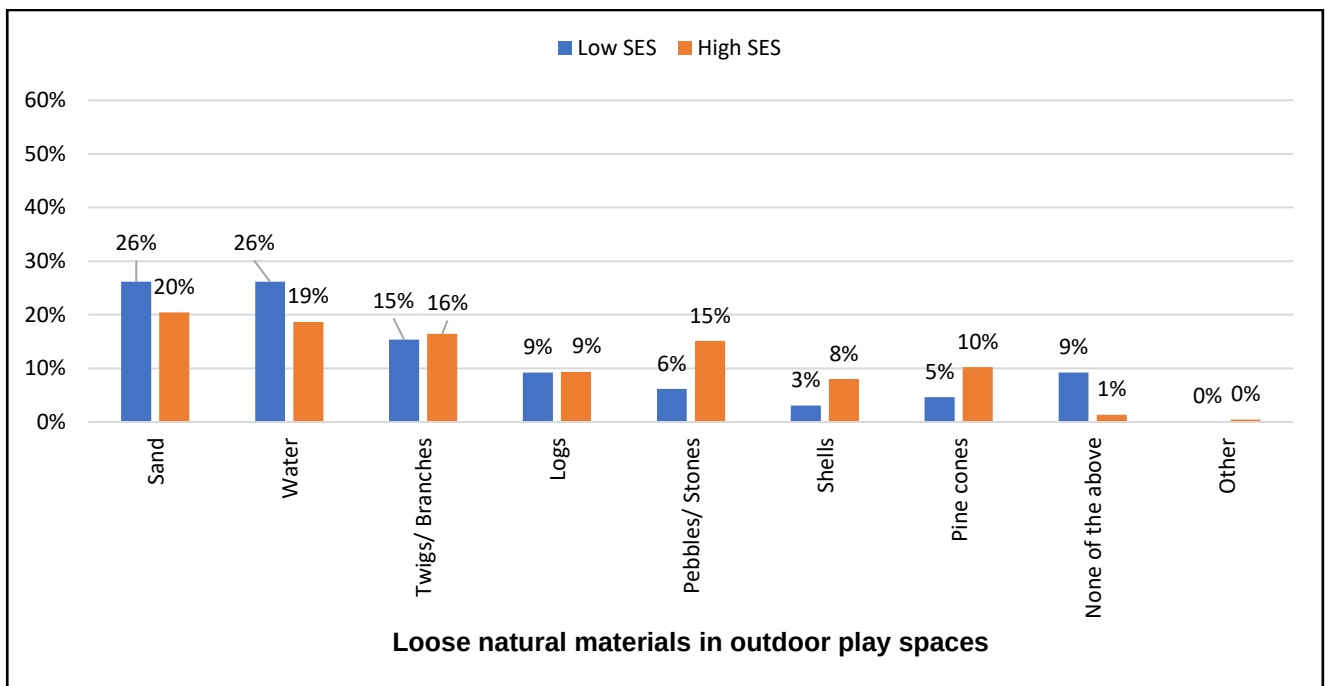


**Fig 7** Types of loose natural materials

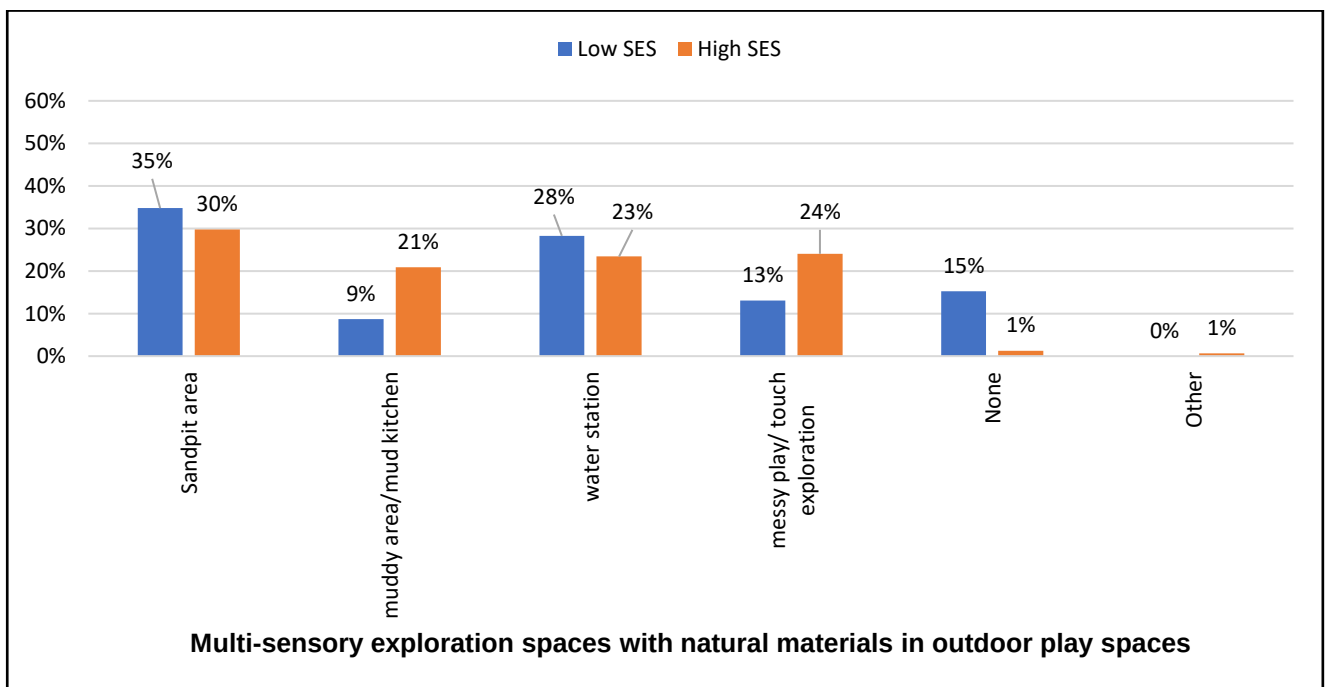


**Fig 8** Types of multi-sensory exploration spaces

### ***Fixed natural resources***

Figure 6 reflects that higher percentages of HSE-ECD centres have the following fixed natural resources: trees (18%), plants (17%), flower gardens (14%), and natural / semi-natural water features (2%), with a much higher percentage of HSE-ECD centres (12%) having tree stumps or logs compared to LSE-ECD centres (1%). The only types of fixed natural resources which a higher percentage of LSE-ECD centres have are

vegetables or herb gardens (14%), rocky areas (10%), and sandy areas (19%). In addition, 12% of LSE-ECD centres have no natural resources, in stark contrast with HSE-ECD centres of which only 1% have no natural resources.

HSE-ECD centres were also found to have different sensory trays that are changed weekly or daily and grass areas. Overall, 82% of LSE-ECD centres were found to have three or fewer types of natural loose/moveable materials, compared to HSE-ECD centres where 76% had three or more types of natural loose/ moveable materials. There were significantly more fixed natural resources in HSE-ECD centres (Chi squared=50.07, DF=7,  $p=0.0001$ ).

### ***Natural loose/ moveable materials***

Figure 7 reflects that higher percentages of HSE-ECD centres have the following more sophisticated natural loose materials: pebbles/ stones (15%), shells (8%), pinecones (10%). Similar percentages of HSE-ECD and LSE-ECD centres have twigs/ branches, and logs. The only types of loose natural materials which a considerably higher percentage of LSE-ECD centres have is sand (26%) and water (26%). In addition, 9% of LSE-ECD centres have none of the above-mentioned loose natural materials, in stark contrast with HSE-ECD centres of which only 1% have no loose natural resources.

HSE-ECD centres, again, were found to have more types of materials including pebbles, shells, and pinecones. There were significantly more loose natural resources in HSE-ECD centres (Chi squared=57.84, DF=7,  $p=0.0001$ ). Overall, 82% of LSE-ECD centres were found to have three or fewer types of natural loose/moveable materials, compared to HSE-ECD centres which had 76% having three or more types of natural loose/ moveable materials.

### ***Multi-sensory exploration spaces***

Figure 8 reflects that higher percentages of HSE-ECD centres have the following multi-sensory exploration space: muddy area / mud kitchen (21%), and messy play/ touch exploration (24%). Similar percentages of HSE-ECD and LSE-ECD centres have water stations, and sand pit areas. The only types of multi-sensory exploration spaces which a considerably higher percentages of LSE-ECD centres have is sand (26%) and water (26%). In addition, 15% of LSE-ECD centres have none of the above-mentioned multi-sensory exploration spaces, in stark contrast with HSE-ECD centres of which only 1% have no multi-sensory exploration spaces.

HSE-ECD centres tended to have more varied multi-sensory exploration spaces which included a mud kitchen and a water pump. LSE-ECD centres had a significantly lower total count of types of multi-sensory exploration spaces (Chi squared=64.39, DF=5,  $p=0.0001$ ).

### Types and total count of additional outdoor play spaces in ECD centres

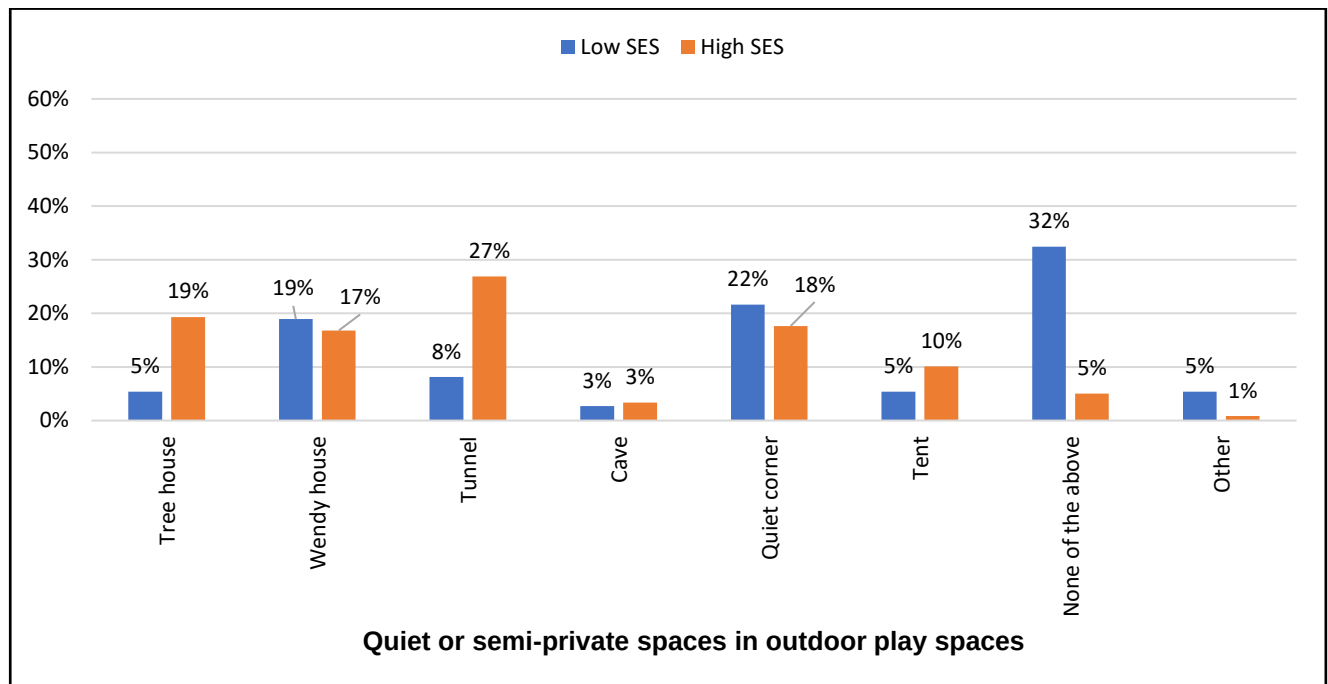


**Fig 9** Types of quiet or semi-private spaces

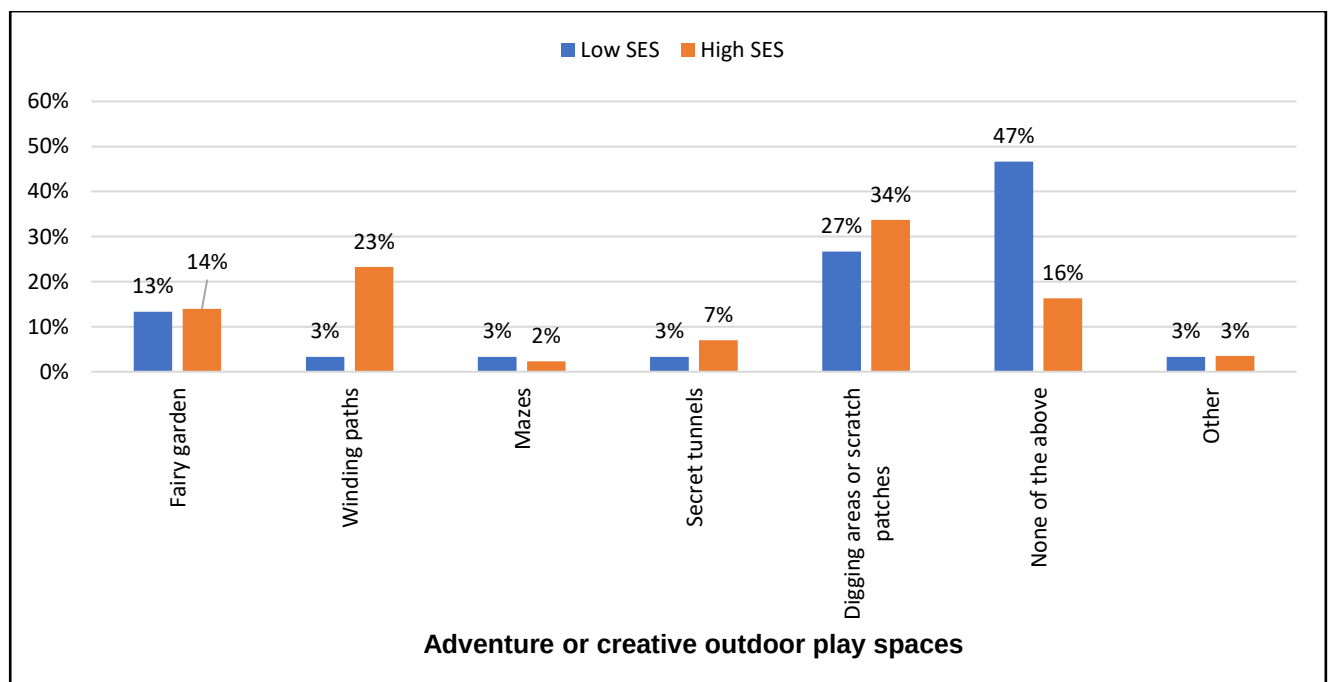


**Fig 10** Types of adventure or creative spaces

Additional physical characteristic types of outdoor play spaces were identified as quiet or semi-private spaces and creative or adventure spaces.

### ***Quiet or semi-private spaces***

Figure 9 reflects that higher percentages of HSE-ECD centres have the following quiet or semi-private spaces: tree houses (19%), tunnels (27%), and tents (10%). The same percentage of HSE-ECD (3%) and LSE-ECD (3%) centres have caves. The only types of quiet or semi-private spaces which a considerably higher percentage of LSE-ECD centres have, are Wendy houses (19%), and quiet corners (22%). In addition, 32% of LSE-ECD centres have none of the above-mentioned quiet or semi-private spaces, in stark contrast with HSE-ECD centres of which only 5% have no quiet or semi-private spaces.

One or fewer quiet or semi-private spaces were found in 86% of LSE-ECD centres, within their outdoor play spaces, compared to 63% of HSE-ECD centres. The HSE-ECD centres had significantly more quiet spaces (Chi squared=64.39, DF=6,  $p=0.0001$ ). Other quiet space descriptions found in the open-ended questions included a Gazebo, that quiet spaces are “only for behaviour management”, and that “quiet time is just going anywhere outside”.

### ***Adventure or creative spaces***

Figure 10 reflects that higher percentages of HSE-ECD centres have the following adventure or creative spaces: winding paths (23%), secret tunnels (7%), and digging areas / scratch patches (34%). Similar percentages of HSE-ECD and LSE-ECD centres have fairy gardens and mazes. In addition, 47% of LSE-ECD centres have none of the above-mentioned adventure or creative spaces, in stark contrast with HSE-ECD centres of which only 16% have no adventure or creative spaces.

In the centres that did have at least one type of adventure or creative space, digging areas or scratch patches were the most common among both LSE- and HSE-ECD centres. Adventure or creative space descriptions found in the comments included “the children make their own space for adventures using the moveable equipment and fabrics”, “environmental area where study items we find in the garden with magnifying glasses”, and “bicycle tracks”. Half of the LSE-ECD centres, however, had no types of adventure or creative spaces available compared to 24% of HSE-ECD centres, with HSE-ECD centres having significantly more adventure and creative play spaces (Chi squared=34.50, DF=5,  $p=0.0001$ ).

## Discussion

Substantial evidence is available in the literature, especially internationally from first world developed countries, that highlights the positive developmental and socio-emotional impact that a wide variety and resource abundance in outdoor play spaces can have on young children (International Play Association, 2014; Kemple et al., 2016; Yogman et al., 2018; Buchbinder, 2022). This research study aimed to compare the physical design and resources of outdoor play spaces in low socioeconomic (LSE) versus high socioeconomic (HSE) early childhood development (ECD) centres in Johannesburg.

The demographics findings highlighted that most LSE-ECD centres were categorised as community-based sites, whereas the HSE-ECD centres were private schools. These LSE-ECD centres received funding from a variety of sources, including private funds such as school fees, government funding from the Department of Social Development (previously) or Department of Education (currently). Further income was sourced through charity drives, community fundraisers, and donations. It was noted that the frequency of the funding for the improvement of outdoor play spaces was limited and inconsistent. In addition to the lack of government subsidies found in this study, these challenges are also a direct result of the inability of parents to pay ECD centre fees due to their low socioeconomic status, household incomes, and South Africa's high incidence of poverty and prevalence of unemployment (Aina & Bipath, 2022; Ashley-Cooper, van Niekerk & Atmore, 2019; Moses & van der Berg, 2023; Statistics South Africa, 2024a). The demographics results for the HSE-ECD centre group highlighted that these centres most categorised as independent or private schools, predominantly received funding privately through school fees, and predominantly used these private funds annually or as needed for the improvement of the outdoor play space, playground equipment, and resources in the outdoor environment. These findings are in line with statistics indicating that higher income quintile households reflecting higher socioeconomic status had greater access to ECD centres in terms of enrolment, resources, and developmental impact (Moses & van der Berg, 2023; Statistics South Africa, 2024b).

A lack of funding for community-based ECD centres has a direct implication on maintaining and improving outdoor play spaces. Research by Dobbins et al., (2020) has shown that improvements to the total quantity, type, and quality of resources within playgrounds, such as shade-cover over improved playground designs, has improved play engagement in these environments (Dobbins et al., 2020).

A difference for all aspects of the playgrounds and resources available in the LSE-ECD versus the HSE-ECD centres in Johannesburg was found. LSE-ECD centres were found to have predominantly traditional playgrounds made up of either steel; steel and wood; or steel, wood, and plastic. Linear swings, climbing jungle gyms, and slides were common fixed manufactured playground structures found in LSE-ECD centres. In addition to fixed manufactured playground structures, limited resource variety and quantity were also noted under natural resources, other multi-sensory exploration areas, loose or moveable materials, manufactured movement toys. The presence of these resources is important in determining future ECD playground designs and programmes based on the play quality with specific resources or the benefits for pre-school learning from specific ECD programmes with children from low-income backgrounds noted in other studies (Trawick-Smith et al., 2015; Moses & van der Berg, 2023). A study on ECD centres within Pretoria townships found that they have fewer early learning modern and age-appropriate infrastructural resources due to the low socioeconomic status of the parents (Aina & Bipath, 2022).

The quantitative evidence for the HSE-ECD centre outdoor play space, however, indicated a greater mixture of physical designs, and significantly more abundant resources and wide variety of play opportunities. Although differences were found between the LSE-ECD and HSE-ECD centres, there were, some interesting similarities were found, which give important insights into what is generally available and accessible in all ECD centres in Johannesburg rather than only in one socioeconomic group. The similarities observed in the outdoor play spaces should be reviewed when addressing future ECD centre outdoor play space improvements, designs, or funding. Traditional playgrounds with fixed wooden playground structures were commonalities among both groups. Both playgrounds commonly presented with higher percentages of linear swings, climbing jungle gyms, and slides, with LSE-ECD centres having more fixed and loose tyres and seesaws, and HSE-ECD centres having more monkey bars, fireman poles, tunnels, and bridges.

The literature has shown that longer stays on playgrounds are found when playgrounds are larger, when there is a presence of mature trees, and equipment to swing, climb, or spin on (Cohen et al., 2023). Both outdoor play spaces presented with trees, plants, sandy areas, and vegetable / herb gardens as common natural resources available outside. Although it is an urban city, these are important findings to note that children in both environments do, to some extent, have access to green spaces within the city. Emphasis is placed on the importance of urban green spaces for overall well-being

(Jabbar, Yusoff & Shafie, 2022). Sandpit areas and water stations were common across both, which should be noted as affordable means to create outdoor play experiences for further multi-sensory and nature-based learning experiences. The natural loose materials available were also common in both groups, including sand, water, and twigs / branches. Buckets and spades (most common), tyres, and soft playground equipment (less so compared to buckets and spades) were common features of both groups. The importance of sandpits, loose parts, and the above types of playground equipment in supporting early learning opportunities and developmental enrichment is well known (Maxwell, Mitchell & Evans, 2008; Olsen & Smith, 2017; Simoncini & Lasen, 2021).

Having a small variety of equipment, materials, toys, or resources was a common trend noted in LSE-ECD centres outdoor play spaces. Literature has repeatedly reflected that the variety and quantity of play resources, specifically outdoor play resources are important in enriching the overall development and well-being of early learners through the power of play (Kemple et al., 2016; Yogman et al., 2018; Aina & Bipath, 2022; Buchbinder, 2022). It has been shown that just by providing additional outdoor play spaces within communities (even if the LSE-ECD centres make use of a shared/ communal safe outdoor play space nearby), there is increased outdoor play in low-income children (Mölenberg et. Al 2019).

HSE-ECD centres were found to have both creative or adventure playgrounds as well as traditional playgrounds and were found to be predominantly made of wood. Linear swings, climbing jungle gyms, and slides were common fixed manufactured playground structures found in HSE-ECD centres, much like in the LSE-ECD centres. However, most HSE-ECD centres had many other types of fixed manufactured playground structures, including monkey bars, fireman poles, tunnels and bridges. Having a number of equipment, materials, toys, or resources was a common trend noted for HSE-ECD centre outdoor play spaces. This wide variety and resource abundance was also noted in addition to fixed manufactured playground structures, and other multi-sensory areas and exploration materials, private spaces, and types and total count of creative or adventure spaces. Interestingly, both groups (to a greater or lesser extent) were found to have somewhat of a variety of types of manufactured movement toys. These included (in order of commonality): balls, scooters/pushbikes/tricycles, skipping ropes, bats/ rackets, and hula-hoops.

Quiet corners and Wendy houses were mostly found in both groups of ECD centres, however, the physical design and purpose of these quiet corners appeared to contrast

quite significantly across the groups. The quiet corners of the LSE-ECD centres tended to be anywhere outside and for behaviour management purposes. The quiet corners of the HSE-ECD centres tended to be more specific to a tree house, Wendy house, tunnel, or tent. The purpose of quiet corners in HSE-ECD centres included free play, hide & seek type games, management of sensory overload, or creating adult-free private zones for older children during outdoor playtime. The types of common creative or adventure spaces found in both the groups were digging areas or scratch patches. The literature supports the crucial need for natural play spaces and spaces that offer additional opportunities for enriched play experiences through independence, creativity, adventure, or exploration (Luchs & Fikus, 2013b; Olsen, 2013; Engelen et al., 2018).

Despite the limited variety and quantity of playground resources, and opportunities for play, the data collection process revealed that LSE-ECD centre educators displayed an eagerness for furthering means of funding for the improvement of the outdoor play space, provision of resources, and continued professional development. Visser et al. (2021) similarly found an eagerness by educators for further educator teaching, learning, and training was apparent even when there were limited resources available. Intervention strategies such as these are encouraged to be explored by a variety of professionals in the education field to continue to support more children, especially those falling within a lower socioeconomic background. Occupational therapists from the University of the Free State and the South African Institute of Sensory Integration (SAISI) provide intervention opportunities in LSE environment by designing custom and low-cost playgrounds using Ayre's Sensory Integration principles to promote children in under-resourced environments (van Jaarsveld et al., 2021).

Visser et al., (2021) found that Bloemfontein ECD centres had limited access to continuous educator training, effective ECD centre management, limited quality of ECD centre environment and resources. They also found that ECD centres had reduced quality of contextually relevant ECD programmes related to policies and legislation (Visser et al., 2021). Therefore, despite the educator's knowledge and awareness of the need for and benefits of quality ECD resources, the lack of funding significantly limited this provision (Aina & Bipath, 2022).

This study found that there are some differences in the availability of outdoor play space, resources and materials in LSE-ECD centres. Findings also showed that there were some similarities in the play resources available between high and low socioeconomic environments. This is encouraging but does show that there is still a need

for more funding, resources and training for playgrounds in low socioeconomic environments.

## Limitations

The effects of COVID-19 on ECD centre funding, attendance, educator capacity to participate in research while managing stressful financial and/ or personal situations, and outdoor play space restrictions impacted data collection. Data collection took place after ECD centres were allowed to re-open and run again as they had previously. Due to the impacts of COVID-19, many centres either closed, moved to smaller premises, or could not afford the upkeep or maintenance of much of their outdoor play spaces, equipment, and resources in their centres. COVID-19 also reportedly impacted the demographics at the schools with many centres taking longer to get children back to attending creche or pre-school after the lockdown ended. These changes impacted the researcher's ability to access many LSE-ECD centres for data collection.

There was also a lack of current contact details of registered ECD centres on the database in Johannesburg since the change in registration or reported challenges around registration from the Department of Social Development to the Department of Education at the end of 2021. Many centres were either in the process of trying to re-register after registration expiration, had not registered with the correct Department in time for the 2022 year, or their contact details (phone number, email address, or physical address) had changed since the compiled database list provided by the Department of Education. This also led to the researcher having difficulty accessing LSE-ECD centres, in particular.

Overall data and internet connection especially for the LSE-ECD centre group had a profound impact on the research participants that participated, even with as many in-person ECD centre visits as possible.

## Conclusion

This research study aimed to determine and compare the physical design, equipment, and resources available in outdoor play spaces in LSE versus HSE-ECD centres in Johannesburg for recommendations for outdoor play spaces in Johannesburg ECD centres going forward. It was found that LSE-ECD centres have limited resource variety in their outdoor play spaces and HSE-ECD centres have abundant resources, and a wide variety within their outdoor play spaces. Differences between the two groups were found regarding the total count of playground types, fixed structural material types, playground equipment types, natural resources, multi-sensory exploration areas,

manufactured loose materials, natural loose materials, manufactured movement toys, quiet or semi-private spaces, and creative or adventure spaces. Similarities for both LSE-ECD and HSE-ECD were found within the outdoor play spaces, frequently related to sand and water natural outside play, despite the variety and quantity of resources in the outdoor play spaces. These research results are important for the continued improvement in the early childhood development education sector, for early intervention services such as occupational therapy, for more effective outdoor play space physical design and provision in South Africa, and for future research into the field of outdoor play spaces in support of health and well-being promotion in the long-term for a better South Africa.

## Recommendations

Based on the reduced variety (type) and quantity (number/ count), it is recommended that further funding for the improvements, maintenance, and outdoor play space provision for children within these settings or communities be prioritised by both the Department of Education with whom they are registering, as well as within community-based non-profit organisations that are working hard to improve ECD services through funding, research and education around South Africa.

This research focused on the physical design, equipment and resources availability found within ECD centre outdoor play spaces. It is recommended that further research goes into how children are engaging with the physical design of outdoor play. Further research is also recommended to explore the developmental appropriateness of the physical designs and the quality of the designs related to the children's play quality currently available in South Africa. This research would offer valuable insights for school and community playground design and the overall promotion of play as an occupation for long-term health and development.

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## CHAPTER 3: SYNTHESIS

### 3.1 Final research findings

This research study aimed to answer 3 research objectives, namely: 1) To determine the physical design and availability of equipment within the outdoor play spaces in early childhood development centres in low socioeconomic environments; 2) To determine the physical design and availability of equipment within the outdoor play spaces in early childhood development centres in high socioeconomic environments; and 3) To compare (similarities and differences) the physical design and availability of equipment within outdoor play spaces in early childhood development centres in low and high socioeconomic environments.

Upon analysis, all three research objectives were successfully achieved with interesting and detailed research findings obtained from all four components of the research questionnaire. Detailed research findings for understanding the demographics of both the low-socioeconomic and the high-socioeconomic ECD centre groups can be viewed in Appendix K (a tabular summary of component A demographics), Appendix L (a visual summary of component A demographics), and Appendix M (a brief content analysis of qualitative data in component A). Detailed research findings for further information to supplement and support Chapter 2: Submissible manuscript summary of results and discussion above can be located under Appendix N (a tabular summary of results and data analysis for component B physical design, resources and equipment within outdoor play spaces), Appendix O (a visual summary of results and data analysis for component B physical design, resources, and equipment within outdoor play spaces), and Appendix P (brief content analysis of qualitative data in component B physical design, resources, and equipment within outdoor play spaces). Similarly, Appendix Q, Appendix R, and Appendix S detail the results and summaries of the research findings on the other physical characteristics of outdoor play spaces in both LSE- and HSE-ECD centres, including terrain size, type, shade cover, and water access. Finally, Appendix T and Appendix U detail the results and summaries of the research findings on the subjective view of the educators on the outdoor play space design, equipment, and resources. These results from the findings not covered in the above journal article aim to be further explored with discussion in subsequent journal article submissions in the future due to the important nature of the evidence found.

## 3.2 Strengths and limitations

### 3.2.1 Strengths

On completion and summation of this research study, the merits and, we hope, meaningful community contributions of this study can be noted. Data collection for this study took place over almost a year, from June 2022 to May 2023. This aimed to achieve a large enough sample size so that the research would most effectively represent the Johannesburg ECD centres advocated with this research. This was done by extending the reach of this study as far as possible through as many data collection means as possible to allow as many research participants (head teachers and principals) to be invited and allowed to participate in this research study. The data and results obtained are extremely valuable to continue the early trajectory of outdoor play space research in South Africa, where there is a great gap in our country's statistics and literature to base any intervention, playground designs, or early learning programme planning on our specific population of children and our specific contextual constraints and affordances. The research will hopefully spark further interest from professionals, policymakers and funders in education and health for further research about South African outdoor play space resources. The research also aims for further action steps to be taken towards improving our outdoor play spaces physical design, resource availability, and overall quality. Therefore, despite some limitations, the three research objectives of this study were adequately met.

### 3.2.2 Limitations

This research was not without limitations to the study. These included the effects of COVID-19 on ECD centre funding, attendance, educator capacity to participate in research while managing stressful financial and/ or personal situations, and restrictions on outdoor play space. The data collection for this research took place after the 2020 and 2021 COVID-19 restrictions took place, as well as after the ECD centres were allowed to re-open and run again as they had previously. However, due to the impacts of COVID-19, many centres closed, moved to smaller premises, or could not afford the upkeep or maintenance of much of their outdoor play spaces, equipment, and resources in their centres. COVID-19 also reportedly impacted school demographics, with many centres taking longer to get children back to attending creche or pre-school after the lockdown ended. These changes affected the researcher by being able to access as many LSE-ECD centres for data collection. In addition to the ramifications of COVID-19 on ECD centres, there was a clear lack of current contact details of registered ECD centres in Johannesburg since the change in registration or the reported challenges around the registration from the Department of Social

Development to the Department of Education at the end of 2021. As mentioned in the methodology section, many centres were either in the process of trying to re-register after registration expiration, had not registered with the correct Department in time for the 2022 year, or their contact details (phone number, email address, or physical address) had changed since the compiled database list provided by the Department of Education. This also led to the researcher having difficulty accessing LSE-ECD centres, in particular. Therefore, the overall total population sample size in this research study is made up of a smaller LSE-ECD centre sample size compared to the larger HSE-ECD centre sample size. This discrepancy in the sample sizes in both groups means that the comparison of the LSE-ECD centre results and the HSE-ECD centre results comes with limitations regarding the quality of the LSE-ECD centre data. Other research limitations included potential educator bias for Section D of the research questionnaire, where educators may have felt the need to impress or prove that their centre was meeting the correct requirements of early intervention services. The length of the research questionnaire may have limited educator participation due to time constraints within the working day, or due to data/ internet limitations inhibiting full questionnaire completion. Therefore, despite the email and telephonic reminders from the researcher, there were still many partially complete or incomplete research participant online responses received that were unable to be used for true data analysis, especially from the LSE-ECD centre group. Variations in sample size for each control variable compared may also have been impacted by the subjective understanding of the principal or head teacher of socioeconomic status and the potential categorisation of the students into the incorrect category based on miscommunication. Overall data and Internet connection, especially for the LSE-ECD centre group, had a profound impact on the research participants who participated, even with as many in-person ECD centre visits as possible.

### **3.3 Recommendations**

In light of this, the researcher therefore has the following recommendations that further highlight the importance of some previous recommendations made by other research found in the literature review, or by work already taking place in the South African outdoor play space context.

- Based on the reduced variety (type), quantity (number/ count) and level of satisfaction found within the physical designs and quality of outdoor play spaces in LSE-ECD centres, it is highly recommended that further funding for the improvements, maintenance and provision of outdoor play spaces for children within these settings or

communities is prioritised by both the Department of Education with whom they are registering, as well as within community-based NPOs that are working hard to improve ECD services through funding, research, and education throughout South Africa.

- In support of this research, improvements to the number, type, and quality of resources within parks with playgrounds, as well as physical characteristics such as shade cover over improved playground designs, have been shown to make improvements in the improved engagement in these environments (Dobbinson et al., 2020).
- It has been shown that just by providing additional outdoor play spaces within communities even if the LSE-ECD centres make use of a shared/ communal safe outdoor play space nearby, there is increased outdoor play in low-income children (Mölenberg et al., 2019).
- This research greatly supports and encourages the work of a group of occupational therapists from the University of the Free State and the South African Institute of Sensory Integration (SAISI) in their important efforts to design custom and low-cost playgrounds using Ayres sensory integration® principles to promote children in under-resourced environments (van Jaarsveld et al., 2021).
- Research and intervention strategies such as these are highly encouraged to be explored in a variety of professionals in the education field to continue to support more children, especially those who are of lower socioeconomic background.
- It is also highly recommended that further research is done on how children engage with the physical design and quality of these features of outdoor play that have been found in this study, especially by making comparisons between play experiences and play quality in children playing within LSE-ECD centre outdoor play spaces versus in HSE-ECD centre outdoor play spaces (Bartie et al., 2016).
- Further research is also recommended to explore the developmental relevance of physical designs and the quality of designs related to the quality of children's play currently available in South Africa. For example, whether the linear swings found as commonly available in the outdoor play spaces of the Johannesburg ECD centre are effective for the developmental needs of South African children or whether adaptations to these swings or early intervention programmes should be recommended on how better to make use of them. This research would offer valuable information for school and community playground design and the general promotion of play as an occupation for long-term health and development.

Finally, during data collection, especially during in-person visits to ECD centres, it appeared that educators' understanding of 1) the benefits around outdoor play spaces and 2) the meaning of true accessibility of outdoor play space related to playground design was limited, especially from LSE-ECD centres. Therefore, it is recommended that further community-based education drives move towards educating both educators and parents through potential training or practical implementation drives. This would reinforce and highlight the need and benefit of outdoor play spaces, especially in urban cities like Johannesburg where there is less access to nature or safe outdoor spaces. Further research on universal playground design and accessibility in South African ECD centre outdoor play spaces is crucial. This, in combination with intervention and training, would be recommended to better equip current educators to support more social participation and inclusion of children (Moore, Lynch & Boyle, 2022).

### 3.4. Dissemination of Results

- The author and co-authors aim for the publication of the manuscript presented in this research report (Chapter 2) within the Early Childhood Education Journal, subject to revisions and recommendations offered and advised by the journal reviewers. Publication within an international journal aims to broaden the public knowledge and research worldwide around the physical design and availability of equipment within outdoor play spaces in Johannesburg, South Africa. Ultimately, publication of this study aims to influence both practice and policy.
- The author and co-authors also aim for further publications to be completed to cover the extent of this research which was not able to be covered within the manuscript presented, including presenting the data analysis and discussion of the results found for demographics of outdoor play within ECD centres, external resource and amenity provision around the outdoor play space, as well as the subjective educator view on the outdoor play space supportiveness of play.
- The researcher also aims to share both the final research report, as well as the published manuscript, to be shared with the Department of Education as well as the ECD centres who had personally requested the results of the study. Further governmental and non-governmental funding opportunities may be possible with further information to the public.
- The researcher also aims to partner with other shareholders, communities, schools, and non-profit organisations working in the field of outdoor play space provision, as well as the advocacy for outdoor play in young children.

### 3.5 Conclusion

This research study aimed to determine and compare the physical design, equipment, resources, other physical characteristics, and the quality available in outdoor play spaces in LSE- versus HSE- ECD centres in Johannesburg for recommendations for outdoor play spaces in Johannesburg ECD centres going forward. In this analysis, LSE-ECD centres were found to have *limited resource variety and quantity* in their outdoor play spaces. HSE-ECD centres were found to have *abundant resources and a wide variety* in their outdoor play spaces. These themes indicate significant differences regarding the variety and quantity of playground types, fixed structural material types, playground equipment types, natural resources, multi-sensory exploration areas, manufactured loose materials, natural loose materials, manufactured movement toys, quiet or semi-private spaces, and creative or adventure spaces. Common features found within the outdoor play spaces, frequently related to sand and water natural play outside, despite the variety and quantity of resources in the outdoor play spaces. These research results are important for the continued improvement in the early childhood development education sector, for early intervention services such as Occupational Therapy, for more effective outdoor play space physical design and provision in South Africa, and for future research into the field of outdoor play spaces in support of health and well-being promotion in the long-term for a better South Africa.

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## APPENDICES

### Appendix A: Ethics Clearance Certificate



R14/49 Miss Lara Ferna Clarkson

#### HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

#### CLEARANCE CERTIFICATE NO. M200956

**NAME:** Miss Lara Ferna Clarkson  
**(Principal Investigator)**  
**DEPARTMENT:** Health Sciences  
Early Childhood Development Centres, Johannesburg

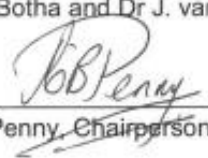
**PROJECT TITLE:** A comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg

**DATE CONSIDERED:** 02/10/2020

**DECISION:** Approved

**CONDITIONS:** Provide written permissions to conduct the study from the Managers/Principals of the ECD Centres

**SUPERVISOR:** Mrs M. Botha and Dr J. van der Linde

**APPROVED BY:**   
Dr CB Penny, Chairperson, HREC (Medical)

**DATE OF APPROVAL:** 30/11/2020

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

#### DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the Third Floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. I agree to submit a yearly progress report. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in October and will therefore be due in the month of October each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

## Appendix B: Gauteng Department of Education Research Approval Letter



**GAUTENG PROVINCE**

Department: Education

REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

### GDE RESEARCH APPROVAL LETTER

|                                |                                                                                                                        |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Date:                          | 07 September                                                                                                           |
| Validity of Research Approval: | 04 February 2020 – 30 September 2020<br>2019/601                                                                       |
| Name of Researcher:            | Clarksson LF                                                                                                           |
| Address of Researcher:         | 22a Bum Waverley<br>Johannesburg                                                                                       |
| Telephone Number:              | 0725710045                                                                                                             |
| Email address:                 | <a href="mailto:Clarkson.lara@gmail.com">Clarkson.lara@gmail.com</a>                                                   |
| Research Topic:                | Comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg |
| Type of qualification          | MSc Occupational Therapy                                                                                               |
| Number and type of schools:    | 80 ECD Sites                                                                                                           |
| District/s/HO                  | Johannesburg East, Johannesburg, Johannesburg North, Johannesburg Central, Johannesburg West                           |

### **Re: Approval in Respect of Request to Conduct Research**

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

*Charlene 09/09/2020*

The following conditions apply to GDE research. The researcher may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

*Making education a societal priority*

**Office of the Director: Education Research and Knowledge Management**

7<sup>th</sup> Floor, 17 Simmonds Street, Johannesburg, 2001

Tel: (011) 355 0488

Email: [Faith.Tshabalala@gauteng.gov.za](mailto:Faith.Tshabalala@gauteng.gov.za)

Website: [www.education.gpg.gov.za](http://www.education.gpg.gov.za)

2. The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.
3. Because of COVID 19 pandemic researchers can ONLY collect data online, telephonically or may make arrangements for Zoom with the school Principal. Requests for such arrangements should be submitted to the GDE Education Research and Knowledge Management directorate. The approval letter will then indicate the type of arrangements that have been made with the school.
4. The Researchers are advised to make arrangements with the schools via Fax, email or telephonically with the Principal.
5. A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.
6. A letter / document that outline the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.
7. The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.
8. Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.
9. Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year.
10. Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.
11. It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.
12. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.
13. The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.
14. On completion of the study the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.
15. The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.
16. Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards



Mr Gumani Mukatuni

Acting CES: Education Research and Knowledge Management

DATE: 09/09/2020

## Appendix C: Information Letter

UNIVERSITY OF THE  
WITWATERSRAND,  
JOHANNESBURG



### INFORMATION LETTER

Good Day,

I am Occupational Therapist, Lara Clarkson completing a master's degree in Occupational Therapy at the University of the Witwatersrand. The title of my study is as follows:

A comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg.

Play is crucial for early child development and it is well known that play spaces add to the development of play as a child's primary occupation. Therefore, the purpose of this study is to determine what the outdoor play spaces in Johannesburg early childhood development (ECD) centres look like in high and low socioeconomic environments and describe if there are differences or similarities between them.

I am inviting you to take part in the research study described above and would be most grateful if you would consider participating in this work on behalf of your ECD centre.

The study will be conducted by means of a questionnaire. I would appreciate your participation by taking a few minutes of your time to answer the questionnaire. The questions will require some reflection of the specific aspects of the outdoor play space at your ECD centre. The questionnaire should not take longer than 15 minutes to complete. The research study will in no way put a participant at risk or in harm's way and all aspects have been explored to ensure this. Participation is voluntary. Refusal to participate will involve no penalty. You may also withdraw from participating in the study at any time without repercussions. Furthermore, concerted efforts will be made to keep your ECD centre's personal information confidential. The identity of the centre will not be disclosed to anyone and this will be ensured by referring to all research participants (ECD centres) by participant number only with the online questionnaire being on a safe and secure platform.

This study should reveal results that are helpful in developing solutions for more effective ways of using limited play space, resources and access to support children's development in outdoor play spaces in Johannesburg and potentially applied for other cities and towns in South Africa. This information can potentially also be used to investigate beneficial improvements for community and school playground design in low and high socioeconomic status schools to help boost children's development in South Africa. You as a participant in this study will be given pertinent information on the study while involved in the project as well as after the results are available. Data will be kept

for two years if published or six years if not published, after this period the data will be destroyed.

If you have any queries or concerns or would like further clarity, more information may be obtained from Lara Clarkson at email address [Clarkson.lara@gmail.com](mailto:Clarkson.lara@gmail.com).

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research. If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on [Clement.Penny@wits.ac.za](mailto:Clement.Penny@wits.ac.za). The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are [Zanele.Ndlovu@wits.ac.za](mailto:Zanele.Ndlovu@wits.ac.za) and [Rhulani.Mukansi@wits.ac.za](mailto:Rhulani.Mukansi@wits.ac.za).

Thank you

Lara Clarkson

BSc (OT) WITS

## Appendix D: Informed Consent Form

UNIVERSITY OF THE  
WITWATERSRAND,  
JOHANNESBURG



### INFORMED CONSENT FORM

I, \_\_\_\_\_, principal/ head teacher at the Early Childhood Development centre, \_\_\_\_\_, agree to participate in the research study entitled “A comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg” conducted by Lara Clarkson.

The researcher has discussed the research with me. I have had the opportunity to ask questions about the research and I have received answers that are satisfactory to me. I have read and kept a copy of the information sheet and I understand the general purpose and method of this research. If I have any queries or concerns or would like further clarity, more information may be obtained from Lara Clarkson at email address [Clarkson.lara@gmail.com](mailto:Clarkson.lara@gmail.com).

I agree to take part because

1. I now know what the study involves and what is required of me if I participate
2. I can withdraw from the study at any time
3. I can obtain information in relation to the project
4. My personal information will be kept confidential

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

## Appendix E: Permission Letter for Photographs to be used

UNIVERSITY OF THE  
WITWATERSRAND,  
JOHANNESBURG



### PERMISSION LETTER FOR PHOTOGRAPHS TO BE USED

Dear Principal/ Head Teacher,

I, Lara Clarkson, am aiming to do research for the master's degree of Occupational Therapy at the University of the Witwatersrand for my study the research study entitled "A comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg". Play is crucial for early child development and it is well known that play spaces add to the development of play as a child's primary occupation.

This study should reveal results that help develop solutions for more effective ways of using limited play space, resources and access to support children's development in outdoor play spaces in Johannesburg and potentially applied for other cities and towns in South Africa. This information can potentially also be used to investigate beneficial improvements for community and school playground design in in South Africa.

As this research focuses on ECD centres in Johannesburg I seek permission to obtain photographs of the outdoor play space at the ECD centres. These photographs should be only of the play space and resources, with no children in the photographs and thus taken at a time the children are not on the playground. These photographs will be used purely for what is relevant to this study to better understand the size and safety of the playgrounds to be able to make a comparison. The photographs will be stored safely on a secure password-locked online drive for the purpose of this study. Please if possible send clear photographs to Lara Clarkson (see email address and contact number below) of the centre's outdoor play space so that this visual information can supplement the data recorded from the online questionnaire. If you have any queries or concerns or would like further clarity, more information may be obtained from Lara Clarkson at email address [Clarkson.lara@gmail.com](mailto:Clarkson.lara@gmail.com) or contact number 072 571 0045.

I, \_\_\_\_\_ agree to send photographs of the Early Childhood Development centre, \_\_\_\_\_, outdoor play space over WhatsApp or email, or if I am unable to do so have photographs of the ECD centre taken by the researcher on an agreed upon date.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

## Appendix F: Initial Self-developed Questionnaire Prior to Content Validity

### SELF-DEVELOPED ONLINE QUESTIONNAIRE

This self-developed questionnaire has been designed with information supported from outdoor play space literature as described above. Certain elements of other play space tests such as the Test of Environmental Supportiveness (TOES) have been adapted for this study in component D. Thank you for your participation in this study.

#### COMPONENT A – DEMOGRAPHICS WITHIN ECD CENTRE OUTDOOR PLACES

##### Instructions:

For each of the following questions, please fill in your answer in the space provided. Please answer all questions.

1. How many children are currently attending the ECD centre daily?  
\_\_\_\_\_
2. What is the age range of children that are currently attending the ECD centre?  
\_\_\_\_\_
3. Do all ages of children at the ECD centre play on the same outdoor play space at the same time? If not, please specify  
\_\_\_\_\_
4. What is the ratio of teachers/ support staff to children in the outdoor play space during supervision of outdoor play time?  
\_\_\_\_\_
5. What category does your ECD centre fall into?
  - a. Independent school
  - b. Community-based site
  - c. Public ordinary school
  - d. Special school
  - e. Other (please specify)
6. Furthermore, how is your ECD centre funded?
  - a. Privately funded
  - b. Government funded (by Department of Social Development)
  - c. Charity/ non-governmental/ non-profit organisation funded
  - d. Other (please specify) \_\_\_\_\_
7. To the best of your knowledge, which category would you place your ECD centre within in terms of its socioeconomic position?
  - a. Low
  - b. High
8. How often does the outdoor play space at your ECD centre receive funding for improvement of the space, playground equipment, materials or toys in the outdoor environment?
9. How much time during the school day do children play in the outdoor play space at the ECD centre?  
\_\_\_\_\_

#### COMPONENT B – TYPE OF OUTDOOR PLAY SPACE AND PLAY SPACE EQUIPMENT & RESOURCES

##### Instructions:

This section is to help the researcher understand what the early childhood developmental centre outdoor play space physically looks like to create a visual map of the area. For each of the following questions, check the one best response. Please answer all questions.

1. What type of playground would best describe the outdoor play space at the ECD centre?

- a. Traditional playground (playground with predominantly fixed manufactured playground structures)
  - b. Natural playground (playground with majority elements in the natural environment for structures such as trees and logs, minimal manufactured structures and more natural or prefabricated loose/ movable materials)
  - c. Creative or adventure playground (playground with opportunities for various types of creative play, exploration and movement, various areas to play in with semi-private spaces, and prefabricated loose/ movable materials that are multi-purpose)
  - d. A combination of option a and b
  - e. A combination of option a and c
  - f. A combination of option b and c
  - g. A combination of all of the above
  - h. The outdoor play space only has no playground structures or natural elements, but rather only a concrete/ sand space outdoors
  - i. There is no outdoor play space at the ECD centre
  - j. Other (please specify) \_\_\_\_\_
2. If there are fixed manufactured playground structures at the ECD centre, what materials are they predominantly made of?
  - a. Wood
  - b. Plastic
  - c. Steel
  - d. There are no fixed manufactured playgrounds structures at the ECD centre
  - e. Other (please specify)
3. Please select the manufactured playground equipment found in the outdoor play space at the ECD centre that the children can move on:
  - a. Linear swings (swings that swing forward and back)
  - b. Rotational swings (swings that swing in more circular movement from one point)
  - c. Loose tyres to climb through or roll around
  - d. Fixed tyres in the ground for children to walk on
  - e. Merry-go-round
  - f. Seesaw
  - g. Monkey bars
  - h. Climbing jungle gym
  - i. Fireman pole
  - j. Slide
  - k. Tunnel
  - l. Trampoline
  - m. Bridge
  - n. Other (please specify)
  - o. There is no manufactured playground equipment at the ECD centre
4. Please select the natural aspects that are found in the outdoor play space at the ECD centre:
  - a. Trees
  - b. Plants
  - c. Vegetables gardens
  - d. Flower gardens
  - e. Tree stumps or logs
  - f. Rocky area
  - g. Sandy area
  - h. Other (please specify)
  - i. There are no natural aspects in the outdoor play space at the ECD centre
5. Please select the playground equipment found in the outdoor play space at the ECD centre that the children can explore the feeling of touch
  - a. Sandpit area
  - b. Mud area
  - c. Water station for water play
  - d. Natural water stream
  - e. Open natural vegetation area

- f. Messy play station
  - g. None of the above
  - h. Other (please specify)
6. Please select the manufactured loose/ moveable materials found the in the outdoor play space at the ECD centre that the children can construct with or engage in creative play with:
- a. Buckets and spades
  - b. Pots and pans
  - c. Plastic piping
  - d. String/ fabric/ netting
  - e. Recycled materials
  - f. Tyres
  - g. Soft playground equipment such as blocks or half moons
  - h. None of the above
  - i. Other (please specify)
7. Please select the natural loose/ moveable materials found the in the outdoor play space at the ECD centre that the children can construct with or engage in creative play with?
- a. Sand
  - b. Water
  - c. Twigs
  - d. Branches
  - e. Logs
  - f. Pebbles
  - g. Shells
  - h. Pine cones
  - i. None of the above
  - j. Other (please specify)
8. Please select the manufactured loose/moveable toys found in the outdoor play space at the ECD centre that the children can move with:
- a. Balls
  - b. Scooters/ pushbikes/ tricycles
  - c. Skipping rope
  - d. Bats/ racquets
  - e. Swing ball
  - f. Wheelbarrow
  - g. Ladders
  - h. Bucket stilts
  - i. Hoppy balls
  - j. None of the above
  - k. Other (please specify)
9. Please select whether the outdoor play space has any type of quiet or semi-private space that allows for quiet time:
- a. Tree house
  - b. Wendy house
  - c. Tunnel
  - d. Cave
  - e. Quiet corner
  - f. None of the above
  - g. Other (please specify)
10. Please select the types of creative or adventure spaces there are for children's creative play outdoors?
- a. Fairy garden
  - b. Winding paths
  - c. Mazes
  - d. Secret tunnels
  - e. Digging areas or scratch patches
  - f. None of the above
  - g. Other (please specify)

## COMPONENT C – OTHER PHYSICAL CHARACTERISTICS OF OUTDOOR PLAY SPACE

### Instructions:

For each of the following questions, check the one best response. Please answer all questions.

1. Please select the type/s of terrain that can be found in the outdoor play space at the ECD centre?
  - a. Grass
  - b. Sand
  - c. Concrete
  - d. Bricks
  - e. Bark chips
  - f. Recycled rubber
  - g. Gravel
  - h. Astroturf/ plastic grass
  - i. Other (please specify)
  - j. None
2. Please select the estimated size of the outdoor play space at the ECD centre
  - a. 0-20 square metres
  - b. 20-50 square metres
  - c. 50-100 square metres
  - d. 100-150 square metres
  - e. 150-200 square metres
  - f. Bigger than 200 square metres
3. Is there shade cover for the children in the outside play area at the ECD centre?
  - a. Yes
  - b. No
4. Please select the maximum height of the fixed manufactured playground equipment in the outdoor play space at the ECD centre?
  - a. 0-1 metre
  - b. 1-2 metres
  - c. 2-3 metres
  - d. 3-4 metres
  - e. 4-5 metres
  - f. Above 5 metres
  - g. There is nothing with height in the outdoor play space
5. If there are fixed manufactured playground structures, is there soft terrain underneath these to ensure safety should the children fall?
  - a. Yes (Please specify what type)
  - b. No
6. Is there access to a water source outside for the children to drink water?
  - a. Yes
  - b. No
7. Is there close access to a bathroom area from the outside play area for the children to go to the toilet or wash their hands?
  - a. Yes
  - b. No
8. Is there a safe storage facility for loose parts/ moveable equipment during non-school hours?
  - a. Yes
  - b. No
9. Please select the type of security boundaries there are around the outdoor play space area at the ECD centre
  - a. Brick walls
  - b. Electric fence
  - c. Alarm system
  - d. Plastic/ steel/ wooden fencing
  - e. Barbed wire
  - f. Trees or plants
  - g. None of the above

h. Other (please describe)

#### COMPONENT D- SUBJECTIVE VIEW THE OUTDOOR PLAY SPACE

##### **Instructions:**

For each of the following questions, check the one best response. Please answer all questions.

(Adapted from Bronson & Bundy's Test of Environmental Supportiveness (2001), from the Revised Knox Preschool Play Scale (1968), and from Ayres Sensory Integration fidelity measure structural elements (Parham et. al, 2007)

1. How much do you agree with this statement: "The outdoor play space at the ECD centre is physically safe"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
2. How much do you agree with this statement: "The outdoor play space at the ECD centre is accessible and inclusive for all children"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
3. How much do you agree with this statement: "The outdoor play space at the ECD centre has a sensory environment that offers adequate invitation to the children for play"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
4. How much do you agree with this statement: "The amount and configuration of outdoor space at the ECD centre supports the activities of the player"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
5. How much do you agree with this statement: "The outdoor play space is supporting all children's rights to play and freedom to play opportunities"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
6. How much do you agree with this statement: "The outdoor play space at the ECD centre has sufficient space for all the children to play freely"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
7. How much do you agree with this statement: "The outdoor play space, resources and equipment supports age-appropriate gross motor developmental milestones"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree

8. How much do you agree with this statement: "The natural/ fabricated objects in the outdoor play space support the activity of the player"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
9. How much do you agree with this statement: "The play materials support the child's development of age-appropriate fine motor manipulation, construction, purpose and attention"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
10. How much do you agree with this statement: "The outdoor play space at the ECD centre is regularly checked and maintained for safety, health or security hazards to protect the children"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
11. How much do you agree with this statement: "There is sufficient storage to outdoor play space loose/ moveable materials for safe keeping"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
12. How much do you agree with this statement: "There is sufficient play time during the school day for children to play freely in the outdoor play space"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
13. How much do you agree with this statement: "The outdoor play place supports the player's participation in developmentally -appropriate type of play, social cooperation, humour and language development"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
14. How much do you agree with this statement: "The caregivers in the outdoor play space promote player's activities and play opportunities and do not interfere with the player's activities and play opportunities"
  - a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
15. How much do you agree with this statement: "The caregivers in the outdoor play space adhere to reasonable and consistent boundaries/ rules for the children in the play space"
  - a. Strongly Agree
  - b. Agree

- c. No opinion
  - d. Disagree
  - e. Strongly Disagree
16. How much do you agree with this statement: "The outdoor play space provides for adequate space for flow of vigorous physical activity"
- a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
17. How much do you agree with this statement: "The outdoor play space is regularly and routinely monitored for ensuring safety regulations"
- a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree
18. How much do you agree with this statement: "The outdoor play space allows for variety of play, creativity, spontaneity, continued interest and fun for all players"
- a. Strongly Agree
  - b. Agree
  - c. No opinion
  - d. Disagree
  - e. Strongly Disagree

# Appendix G: Content Validity Redcap Questionnaire

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## Content Validity Questionnaire

Good Day,

I am Occupational Therapist, Lara Clarkson completing a master's degree in Occupational Therapy at the University of the Witwatersrand. The title of my study is as follows:

A comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg. Play is fundamental to early childhood development, health and well-being. It is widely accepted that play spaces and environmental opportunities to play, add to the development of play as a child's primary occupation. Therefore, the purpose of this study is to determine the physical design and quality of the outdoor play spaces of early childhood development (ECD) centres in high and low socioeconomic environments in Johannesburg, to describe whether there are differences or similarities between these outdoor play spaces, and to give recommendations for outdoor play space design based on these findings.

I am inviting you to take part in the research study described above and would be most grateful if you would consider participating in this work on behalf of your ECD centre.

The study will be conducted by means of a questionnaire. I would appreciate your participation by taking a few minutes of your time to answer the questions. The questions will require some reflection of the specific aspects of the outdoor play space at your ECD centre. The questionnaire should not take longer than 15 minutes to complete.

This study should reveal results that are helpful in developing solutions for more effective ways of using limited play space, resources and access to support children's development in outdoor play spaces in Johannesburg and potentially applied for other cities and towns in South Africa. This information can potentially also be used to investigate beneficial improvements for community and school playground design in low and high socioeconomic status schools to help boost children's development in South Africa. You, as a participant in this study, will be given pertinent information on the study while involved in the project as well as after the results are available. Data will be kept for two years if published or six years if not published, after this period the data will be destroyed.

The research study will in no way put a participant at risk or in harm's way and all aspects have been explored to ensure this. Participation is voluntary. Refusal to participate will involve no penalty. You may also withdraw from participating in the study at any time without repercussions. Furthermore, concerted efforts will be made to keep your ECD centre's personal information confidential. The identity of the centre will not be disclosed to anyone and this will be ensured by referring to all research participants (ECD centres) by participant number only with the online questionnaire being on a safe and secure platform.

If you have any queries or concerns or would like further clarity, more information may be obtained from Lara Clarkson at email address clarkson.lara@gmail.com.

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research. If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za.

Please complete the survey below.

Thank you!

### Content Validity Inclusion Criteria

Please only fill in this content validity questionnaire if you feel that you are an expert in the field of outdoor play spaces for children age 6 months to 6 years.

Do you meet the above criteria?

Thank you very much for your willingness to participate in this study.

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### COMPONENT A - DEMOGRAPHICS WITHIN EARLY CHILDHOOD DEVELOPMENT CENTRE OUTDOOR PLAY SPACES

Please will you rate each question in Component A in terms of each question's relevance, clarity, simplicity, and ambiguity.

E.g. After reading question A1, is this question relevant to the study? Is the question clear enough? Is the question simple enough? And is the question ambiguous?

You are not required to answer the research question itself, just assess the validity of the question for this particular study.

There are 9 questions to evaluate in Component A.

#### Question A1

A1. How many children are currently attending the ECD centre daily?

☐ 0-10 ☐ 11-20 ☐ 21-30 ☐ 31-40 ☐ 41-50 ☐ 51 or more

Question A1: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question A1: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question A1: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

Question A1: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

#### Question A2

A2. What is the age range of children that are currently attending the ECD centre?

Question A2: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

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Question A2: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

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Question A2: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

---

Question A2: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

---

**Question A3**

A3. Do all ages of children at the ECD centre play in the same outdoor play space at the same time?

☐ Yes ☐ No

---

Question A3: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

---

Question A3: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

---

Question A3: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

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Question A3: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

---

**Question A4**

A4. What is the ratio of teachers/ support staff to children in the outdoor play space during supervision of outdoor play time?

☐ 1 teacher to 5 children ☐ 1 teacher to 10 children ☐ 1 teacher to 15 children ☐ 1 teacher to 20 children ☐ Other

---

If other (please describe)

\_\_\_\_\_

\_\_\_\_\_

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Question A4: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

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Question A4: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

---

Question A4: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

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Question A4: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

---

**Question A5**

A5. What category/ categories does your ECD centre fall into?

☐ Independent school ☐ Community-based site ☐ Public school ☐ Special school ☐ Other

---

If other (please describe)

\_\_\_\_\_

---

Question A5: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

---

Question A5: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

---

Question A5: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

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Question A5: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

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#### Question A6

A6. Furthermore, how is your ECD centre funded?

- ☐ Privately funded ☐ Government funded (by Department of Social Development or Department of Education) ☐ Charity/ non-governmental/ non-profit organisation funded ☐ Other

If other (please describe)

Question A6: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question A6: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question A6: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

Question A6: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

#### Question A7

A7. To the best of your knowledge, which category would you place your ECD centre within in terms of its socioeconomic position?

- ☐ Low socioeconomic status ☐ High socioeconomic status

Question A7: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question A7: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question A7: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

Question A7: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

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#### Question A8

A8. How often does the outdoor play space at your ECD centre receive funding for improvement of the space, playground equipment, materials or toys in the outdoor environment?

- ☐ Every 6 months ☐ Annually ☐ Every 2 years ☐ Every 3 years ☐ Other

If other, please describe

Question A8: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question A8: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question A8: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

Question A8: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

#### Question A9

A9. How much time during the school day do children play in the outdoor play space at the ECD centre?

- ☐ 30 minutes - 1 hour per day ☐ 1 hour - 2 hours per day ☐ 2 -3 hours per day ☐ 3-4 hours per day ☐ More than 4 hours per day

Question A9: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question A9: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question A9: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

Question A9: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

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## COMPONENT B - TYPE OF OUTDOOR PLAY SPACE AND PLAY SPACE EQUIPMENT & RESOURCES

Please will you rate each question in Component B in terms of each question's relevance, clarity, simplicity, and ambiguity.

E.g. After reading Question B1, is this question relevant to the study? Is the question clear enough? Is the question simple enough? And is the question ambiguous?

You are not required to answer the research question itself, just assess the validity of the question for this particular study.

There are 10 questions to evaluate in Component B.

### Question B1

B1. What type of playground would best describe the outdoor play space at the ECD centre?

- ☐ Traditional playground (playground with predominantly fixed manufactured playground structures)  
☐ Natural playground (playground with majority elements in the natural environment for structures such as trees and logs, minimal manufactured structures and more natural or prefabricated loose/ movable materials)  
☐ Creative or adventure playground (playground with opportunities for various types of creative play, exploration and movement, various areas to play in with semi-private spaces, and prefabricated loose/ movable materials that are multi-purpose) ☐ The outdoor play space only has no playground structures or natural elements, but rather only a concrete/ sand space outdoors ☐ There is no outdoor play space at the ECD centre ☐ Other

If other, please describe:

Question B1: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question B1: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B1: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question B1: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

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### Question B2

B2. If there are fixed manufactured playground structures at the ECD centre, what materials are they predominantly made of?

- ☐ Wood ☐ Plastic ☐ Steel ☐ Aluminium ☐ There are no fixed manufactured playgrounds structures at the ECD centre

Question B2: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question B2: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B2: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question B2: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

### Question B3

B3. Please select the manufactured playground equipment found in the outdoor play space at the ECD centre that the children can move on:

- ☐ Linear swings (swings that swing forward and back) ☐ Rotational swings (swings that swing in more circular movement from one point) ☐ Loose tyres to climb through or roll around ☐ Fixed tyres in the ground for children to walk on ☐ Merry-go-round ☐ Seesaw ☐ Monkey bars ☐ Climbing jungle gym  
☐ Fireman pole ☐ Slide ☐ Tunnel ☐ Trampoline ☐ Bridge ☐ There is no manufactured playground equipment ☐ Other

B3. If other, please describe:

Question B3: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question B3: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B3: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

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Question B3: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question B4**

B4. Please select the natural aspects that are found in the outdoor play space at the ECD centre:

- ☐ Trees ☐ Plants ☐ Vegetables gardens ☐ Flower gardens ☐ Tree stumps or logs  
☐ Rocky area ☐ Sandy area ☐ There are no natural aspects in the outdoor play space  
☐ Other

If other, please describe:

Question B4: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question B4: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B4: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question B4: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question B5**

B5. Please select the playground equipment found in the outdoor play space at the ECD centre where the children can explore the feeling of touch

- ☐ Sandpit area ☐ Mud area ☐ Water station for water play ☐ Natural water stream  
☐ Open natural vegetation area ☐ Messy play station ☐ None of the above ☐ Other

If other, please describe:

Question B5: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

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Question B5: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B5: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question B5: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question B6**

B6. Please select the manufactured loose/ moveable materials found in the outdoor play space at the ECD centre that the children can construct with or engage in creative play with:

- ☐ Buckets and spades ☐ Pots and pans ☐ Plastic piping ☐ String/ fabric/ netting ☐ Recycled materials  
☐ Tyres ☐ Soft playground equipment such as blocks or half moons ☐ None of the above  
☐ Other

If other, please describe:

Question B6: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question B6: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B6: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question B6: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question B7**

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B7. Please select the natural loose/ moveable materials found in the outdoor play space at the ECD centre with which the children can engage creatively

- ☐ Sand ☐ Water ☐ Twigs/ Branches ☐ Logs ☐ Pebbles/ Stones ☐ Shells ☐ Pine cones  
☐ None of the above ☐ Other

If other, please describe:

Question B7: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question B7: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B7: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question B7: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

#### Question B8

B8. Please select the manufactured loose/moveable toys found in the outdoor play space at the ECD centre that the children can move with:

- ☐ Balls ☐ Scooters/ pushbikes/ tricycles ☐ Skipping rope ☐ Bats/ racquets ☐ Swing ball  
☐ Wheelbarrow ☐ Ladders ☐ Bucket stilts ☐ Hoppy balls ☐ None of the above  
☐ Other

If other, please describe:

Question B8: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question B8: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B8: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

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Question B8: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

#### Question B9

B9. Please select whether the outdoor play space has any type of semi-private space that allows for quiet or semi-private time:

- ☐ Tree house ☐ Wendy house ☐ Tunnel ☐ Cave ☐ Quiet corner ☐ Tent ☐ None of the above  
☐ Other

If other, please describe:

Question B9: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question B9: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B9: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question B9: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

#### Question B10

B10. Please select the types of creative or adventure spaces there are for children's creative play outdoors:

- ☐ Fairy garden ☐ Winding paths ☐ Mazes ☐ Secret tunnels ☐ Digging areas or scratch patches  
☐ None of the above ☐ Other

If other, please describe:

Question B10: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

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Question B10: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question B10: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question B10: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

### COMPONENT C - OTHER PHYSICAL CHARACTERISTICS OF OUTDOOR PLAY SPACE

Please will you rate each question in Component C in terms of each question's relevance, clarity, simplicity, and ambiguity.

E.g. After reading Question C1, is this question relevant to the study? Is the question clear enough? Is the question simple enough? And is the question ambiguous?

You are not required to answer the research question itself, just assess the validity of the question for this particular study.

There are 9 questions to evaluate in Component C.

#### Question C1

C1. Please select the type/s of terrain that can be found in the outdoor play space at the ECD centre?

☐ Grass ☐ Sand ☐ Concrete ☐ Bricks ☐ Bark chips ☐ Recycled rubber ☐ Gravel  
☐ Astroturf/ plastic grass ☐ Other

If other, please describe:

Question C1: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question C1: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question C1: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

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Question C1: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

#### Question C2

C2. Please select the estimated size of the outdoor play space at the ECD centre:

☐ 0-19 square meters ☐ 20-49 square meters ☐ 50-99 square metres ☐ 100-149 square metres  
☐ 150-200 square metres ☐ Bigger than 200 square metres

Question C2: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question C2: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question C2: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question C2: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

#### Question C3

C3. Is there any natural or manufactured shade cover for the children in the outside play area at the ECD centre?

☐ Yes ☐ No

Question C3: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question C3: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question C3: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question C3: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

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#### Question C4

C4. Please select the maximum height of the fixed manufactured playground equipment in the outdoor play space at the ECD centre:

- ☐ 0-1 metre ☐ 1-2 metres ☐ 2-3 metres ☐ 3-4 metres ☐ 4-5 metres ☐ Above 5 metres  
☐ There is nothing with height in the outdoor play space

Question C4: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question C4: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question C4: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question C4: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

#### Question C5

C5. If there are fixed manufactured playground structures, what type of terrain lies underneath these to ensure safety should the children fall?

- ☐ Grass ☐ Sand ☐ Recycled rubber ☐ Bark chips ☐ None of the above ☐ Other

If other, please describe:

\_\_\_\_\_

Question C5: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question C5: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question C5: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question C5: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

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#### Question C6

C6. Is there access to a nearby water source or tap near the outdoor play space?

- ☐ Yes ☐ No

Question C6: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question C6: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question C6: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question C6: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

#### Question C7

C7. Is there close access to a bathroom area from the outside play area for the children to go to the toilet or wash their hands?

- ☐ Yes ☐ No

Question C7: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question C7: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question C7: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question C7: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

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**Question C8**

C8. Is there a safe storage facility for loose parts/ moveable equipment during non-school hours?

☐ Yes ☐ No

Question C8: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question C8: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question C8: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question C8: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear**Question C9**

C9. Please select the type of security boundaries there are around the outdoor play space area at the ECD centre:

☐ Brick walls ☐ Electric fence ☐ Alarm system ☐ Plastic/ steel/ wooden fencing ☐ Barbed wire  
☐ Trees or plants ☐ No security ☐ Other

If other, please describe:

---

Question C9: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question C9: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question C9: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question C9: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

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**COMPONENT D- SUBJECTIVE VIEW OF THE OUTDOOR PLAY SPACE****(Adapted from Bronson & Bundy's Test of Environmental Supportiveness (2001), from the Revised Knox Preschool Play Scale (1968), and from Ayres Sensory Integration fidelity measure structural elements (Parham et. al, 2007))**

Please will you rate each question in Component D in terms of each question's relevance, clarity, simplicity, and ambiguity.

E.g. After reading Question D1, is this question relevant to the study? Is the question clear enough? Is the question simple enough? And is the question ambiguous?

You are not required to answer the research question itself, just assess the validity of the question for this particular study.

There are 18 questions to evaluate in Component D.

**Question D1. How much do you agree with the statement below:**

|                                                             | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|-------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space at the ECD centre is physically safe | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D1: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D1: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D1: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D1: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear**Question D2. How much do you agree with the statement below:**

|                                                                                       | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|---------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space at the ECD centre is accessible and inclusive for all children | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Question D2: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D2: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D2: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D2: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D3. How much do you agree with the statement below:**

|                                                                                                                             | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|-----------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space at the ECD centre has a sensory environment that offers adequate invitation to the children for play | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D3: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D3: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D3: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D3: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D4. How much do you agree with the statement below:**

|  | Strongly Agree | Agree | No opinion | Disagree | Strongly Disagree |
|--|----------------|-------|------------|----------|-------------------|
|  |                |       |            |          |                   |

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The amount and configuration of outdoor space at the ECD centre support the activities of the children

☐ ☐ ☐ ☐ ☐

Question D4: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D4: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D4: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D4: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D5. How much do you agree with the statement below:**

|                                                                                                      | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space is supporting all children's rights to play and freedom to play opportunities | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D5: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D5: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D5: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D5: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

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**Question D6. How much do you agree with the statement below:**

|                                                                                                   | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|---------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space at the ECD centre has sufficient space for all the children to play freely | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D6: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D6: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D6: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

Question D6: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

**Question D7. How much do you agree with the statement below:**

|                                                                                                              | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|--------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space, resources and equipment support age-appropriate gross motor developmental milestones | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D7: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D7: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D7: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

Question D7: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

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**Question D8. How much do you agree with the statement below:**

|                                                                                                 | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|-------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The natural/ fabricated objects in the outdoor play space supports the activity of the children | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D8: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D8: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D8: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

Question D8: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision ☐ 4- meaning is clear

**Question D9. How much do you agree with the statement below:**

|                                                                                                                                    | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The play materials support the child's development of age-appropriate fine motor manipulation, construction, purpose and attention | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D9: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D9: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D9: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision ☐ 4- very simple

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## Question D9: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D10. How much do you agree with the statement below:**

|                                                                                                                                             | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space at the ECD centre is regularly checked and maintained for safety, health or security hazards to protect the children | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

## Question D10: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

## Question D10: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

## Question D10: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

## Question D10: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D11. How much do you agree with the statement below:**

|                                                                                               | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|-----------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| There is sufficient storage for outdoor play space loose/ moveable materials for safe keeping | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

## Question D11: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

## Question D11: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

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## Question D11: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

## Question D11: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D12. How much do you agree with the statement below:**

|                                                                                                           | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|-----------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| There is sufficient play time during the school day for children to play freely in the outdoor play space | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

## Question D12: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

## Question D12: Clarity

- ☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

## Question D12: Simplicity

- ☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

## Question D12: Ambiguity

- ☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D13. How much do you agree with the statement below:**

|                                                                                                                                                               | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play place supports the children's participation in developmentally-appropriate type of play, social cooperation, humour and language development | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

## Question D13: Relevance

- ☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

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Question D13: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D13: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D13: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D14. How much do you agree with the statement below:**

|                                                                                                                                            | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The caregivers in the outdoor play space promote children's play opportunities and do not interfere with the children's play opportunities | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D14: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D14: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D14: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D14: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D15. How much do you agree with the statement below:**

|                                                                                                                                   | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The caregivers in the outdoor play space adhere to reasonable and consistent boundaries/ rules for the children in the play space | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Question D15: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D15: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D15: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D15: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D16. How much do you agree with the below statement:**

|                                                                                           | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|-------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space provides for adequate space for flow of vigorous physical activity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D16: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D16: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D16: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D16: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D17. How much do you agree with the below statement:**

|                                                                                             | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|---------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space is regularly and routinely monitored for ensuring safety regulations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Question D17: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D17: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D17: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D17: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

**Question D18. How much do you agree with the statement below:**

|                                                                                                                         | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space allows for variety of play, creativity, spontaneity, continued interest and fun for all children | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Question D18: Relevance

☐ 1- not relevant ☐ 2- items need some revision ☐ 3- relevant ☐ 4- very relevant

Question D18: Clarity

☐ 1- not clear ☐ 2- items need some revision ☐ 3- clear but needs minor revision ☐ 4- very clear

Question D18: Simplicity

☐ 1- not simple ☐ 2- items need some revision ☐ 3- simple but needs minor revision  
☐ 4- very simple

Question D18: Ambiguity

☐ 1- doubtful ☐ 2- items need some revision ☐ 3- no doubt but needs some revision  
☐ 4- meaning is clear

Content Validity: Do you have any comments or recommendations for the improvement of this study's questionnaire?

Thank you very much for your participation in this study. Your contribution is greatly appreciated.

## Appendix H: Content Validity Data Analysis

**Appendix Table 1. Content Validity Data Analysis – Degree of Relevance, Clarity, Simplicity, and Ambiguity**

| Degree of Relevance |  |             |             |             |             |             |  |                           |       |    |
|---------------------|--|-------------|-------------|-------------|-------------|-------------|--|---------------------------|-------|----|
|                     |  | Expert<br>1 | Expert<br>2 | Expert<br>3 | Expert<br>4 | Expert<br>5 |  | Expert<br>in<br>agreement | I-CVI | UA |
| Item                |  |             |             |             |             |             |  |                           |       |    |
| A1                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A2                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A3                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A4                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A5                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A6                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A7                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A8                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A9                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B1                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B2                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B3                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B4                  |  | 1           | 1           | 1           | 0           | 1           |  | 4                         | 0.8   | 0  |
| B5                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B6                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B7                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B8                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B9                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B10                 |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C1                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C2                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C3                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C4                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C5                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C6                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C7                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C8                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C9                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D1                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D2                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D3                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D4                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D5                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D6                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D7                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D8                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D9                  |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D10                 |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| D11                 |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |

|                                                                            |  |   |                  |   |                  |   |  |               |                  |                  |
|----------------------------------------------------------------------------|--|---|------------------|---|------------------|---|--|---------------|------------------|------------------|
| D12                                                                        |  | 1 | 1                | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D13                                                                        |  | 1 | 1                | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D14                                                                        |  | 1 | 1                | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D15                                                                        |  | 1 | 1                | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D16                                                                        |  | 1 | 1                | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D17                                                                        |  | 1 | 1                | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D18                                                                        |  | 1 | 1                | 1 | 1                | 1 |  | 5             | 1                | 1                |
|                                                                            |  |   |                  |   |                  |   |  | S-CVI/<br>Ave | 0.99565<br>21739 |                  |
| Proportion<br>Relevance                                                    |  | 1 | 1                | 1 | 0.97826<br>08696 | 1 |  | S-CVI/<br>UA  |                  | 0.97826<br>08696 |
| Average proportion of<br>items judged as relevance<br>across the 5 experts |  |   | 0.99565<br>21739 |   |                  |   |  |               |                  |                  |

| Degree of Clarity |  |             |             |             |             |             |  |                           |       |    |
|-------------------|--|-------------|-------------|-------------|-------------|-------------|--|---------------------------|-------|----|
|                   |  | Expert<br>1 | Expert<br>2 | Expert<br>3 | Expert<br>4 | Expert<br>5 |  | Expert<br>in<br>agreement | I-CVI | UA |
| Item              |  |             |             |             |             |             |  |                           |       |    |
| A1                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A2                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A3                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A4                |  | 1           | 1           | 1           | 1           | 0           |  | 4                         | 0.8   | 0  |
| A5                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A6                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A7                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A8                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A9                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B1                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B2                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B3                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B4                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B5                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B6                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B7                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B8                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B9                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| B10               |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C1                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C2                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C3                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C4                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C5                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C6                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C7                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C8                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| C9                |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |

|                                                                          |                  |                  |   |   |                  |   |  |               |                  |                  |
|--------------------------------------------------------------------------|------------------|------------------|---|---|------------------|---|--|---------------|------------------|------------------|
| D1                                                                       |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D2                                                                       |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D3                                                                       |                  | 0                | 1 | 1 | 1                | 1 |  | 4             | 0.8              | 0                |
| D4                                                                       |                  | 0                | 1 | 1 | 1                | 1 |  | 4             | 0.8              | 0                |
| D5                                                                       |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D6                                                                       |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D7                                                                       |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D8                                                                       |                  | 1                | 1 | 1 | 0                | 1 |  | 4             | 0.8              | 0                |
| D9                                                                       |                  | 1                | 1 | 1 | 0                | 1 |  | 4             | 0.8              | 0                |
| D10                                                                      |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D11                                                                      |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D12                                                                      |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D13                                                                      |                  | 1                | 1 | 1 | 0                | 2 |  | 5             | 1                | 1                |
| D14                                                                      |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D15                                                                      |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D16                                                                      |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D17                                                                      |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
| D18                                                                      |                  | 1                | 1 | 1 | 1                | 1 |  | 5             | 1                | 1                |
|                                                                          |                  |                  |   |   |                  |   |  | S-CVI/<br>Ave | 0.97826<br>08696 |                  |
| Proportion Clarity                                                       | 0.95652<br>17391 | 1                | 1 |   | 0.93478<br>26087 | 1 |  | S-CVI/<br>UA  |                  | 0.89130<br>43478 |
| Average proportion of items<br>judged as clarity across the<br>5 experts |                  | 0.97826<br>08696 |   |   |                  |   |  |               |                  |                  |

**Degree of Simplicity**

|      |  | Expert<br>1 | Expert<br>2 | Expert<br>3 | Expert<br>4 | Expert<br>5 |  | Expert<br>in<br>agreem<br>ent | I-CVI | UA |
|------|--|-------------|-------------|-------------|-------------|-------------|--|-------------------------------|-------|----|
| Item |  |             |             |             |             |             |  |                               |       |    |
| A1   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| A2   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| A3   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| A4   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| A5   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| A6   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| A7   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| A8   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| A9   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| B1   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| B2   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| B3   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| B4   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| B5   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| B6   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| B7   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |
| B8   |  | 1           | 1           | 1           | 1           | 1           |  | 5                             | 1     | 1  |

|                                                                             |  |                  |                  |   |                  |                  |  |               |                  |                          |
|-----------------------------------------------------------------------------|--|------------------|------------------|---|------------------|------------------|--|---------------|------------------|--------------------------|
| B9                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| B10                                                                         |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| C1                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| C2                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| C3                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| C4                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| C5                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| C6                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| C7                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| C8                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| C9                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D1                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D2                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D3                                                                          |  | 0                | 1                | 1 | 1                | 1                |  | 4             | 0.8              | 0                        |
| D4                                                                          |  | 0                | 1                | 1 | 1                | 1                |  | 4             | 0.8              | 0                        |
| D5                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D6                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D7                                                                          |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D8                                                                          |  | 1                | 1                | 1 | 0                | 1                |  | 4             | 0.8              | 0                        |
| D9                                                                          |  | 1                | 1                | 1 | 0                | 1                |  | 4             | 0.8              | 0                        |
| D10                                                                         |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D11                                                                         |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D12                                                                         |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D13                                                                         |  | 1                | 1                | 1 | 0                | 1                |  | 4             | 0.8              | 0                        |
| D14                                                                         |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D15                                                                         |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D16                                                                         |  | 1                | 1                | 1 | 1                | 0                |  | 4             | 0.8              | 0                        |
| D17                                                                         |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
| D18                                                                         |  | 1                | 1                | 1 | 1                | 1                |  | 5             | 1                | 1                        |
|                                                                             |  |                  |                  |   |                  |                  |  | S-CVI/<br>Ave | 0.97391<br>30435 |                          |
| Proportion<br>Simplicity                                                    |  | 0.95652<br>17391 | 1                | 1 | 0.93478<br>26087 | 0.97826<br>08696 |  | S-CVI/<br>UA  |                  | 0.86<br>956<br>521<br>74 |
| Average proportion of<br>items judged as simplicity<br>across the 5 experts |  |                  | 0.97391<br>30435 |   |                  |                  |  |               |                  |                          |

**Degree of Ambiguity**

|             |  | Expert<br>1 | Expert<br>2 | Expert<br>3 | Expert<br>4 | Expert<br>5 |  | Expert<br>in<br>agreement | I-CVI | UA |
|-------------|--|-------------|-------------|-------------|-------------|-------------|--|---------------------------|-------|----|
| <b>Item</b> |  |             |             |             |             |             |  |                           |       |    |
| A1          |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A2          |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A3          |  | 1           | 1           | 1           | 1           | 1           |  | 5                         | 1     | 1  |
| A4          |  | 1           | 1           | 1           | 1           | 0           |  | 4                         | 0.8   | 0  |

|     |  |   |   |   |   |   |  |               |                  |   |
|-----|--|---|---|---|---|---|--|---------------|------------------|---|
| A5  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| A6  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| A7  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| A8  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| A9  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B1  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B2  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B3  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B4  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B5  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B6  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B7  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B8  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B9  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| B10 |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| C1  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| C2  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| C3  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| C4  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| C5  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| C6  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| C7  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| C8  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| C9  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D1  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D2  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D3  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D4  |  | 0 | 1 | 1 | 1 | 1 |  | 4             | 0.8              | 0 |
| D5  |  | 1 | 1 | 1 | 0 | 1 |  | 4             | 0.8              | 0 |
| D6  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D7  |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D8  |  | 1 | 1 | 1 | 0 | 1 |  | 4             | 0.8              | 0 |
| D9  |  | 1 | 1 | 1 | 0 | 1 |  | 4             | 0.8              | 0 |
| D10 |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D11 |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D12 |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D13 |  | 1 | 1 | 1 | 0 | 1 |  | 4             | 0.8              | 0 |
| D14 |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D15 |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D16 |  | 1 | 1 | 1 | 1 | 0 |  | 4             | 0.8              | 0 |
| D17 |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
| D18 |  | 1 | 1 | 1 | 1 | 1 |  | 5             | 1                | 1 |
|     |  |   |   |   |   |   |  | S-CVI/<br>Ave | 0.96956<br>52174 |   |

|                                                                            |                  |                  |   |                  |                  |  |              |  |                 |
|----------------------------------------------------------------------------|------------------|------------------|---|------------------|------------------|--|--------------|--|-----------------|
| Proportion<br>Ambiguity                                                    | 0.97826<br>08696 | 1                | 1 | 0.91304<br>34783 | 0.95652<br>17391 |  | S-CVI/<br>UA |  | 0.84782<br>6087 |
| Average proportion of<br>items judged as ambiguity<br>across the 5 experts |                  | 0.96956<br>52174 |   |                  |                  |  |              |  |                 |

## Appendix I: List of Content Validity Corrections



### LIST OF CORRECTIONS

**Student Name &  
Surname**

: Lara Clarkson

**Student Number**

: 816211

**Title of Protocol**

: Johannesburg

**Date**

: 03/06/2022

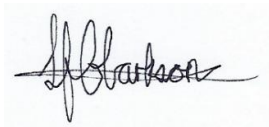
### Appendix Table 2. Content Validity Corrections outlined

| Question number    | Content Validity<br>Expert Comment/<br>Score                               | Changes Made                                                                                                                                                                        |
|--------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inclusion criteria | None – just edited for clarity                                             | 2. To the best of your knowledge, you feel that your ECD centre falls either within a low socioeconomic status or in a high socioeconomic status in the greater Johannesburg region |
| A1.2               | None – added question for further clarity on demographics                  | A1.2. How many children are there on average per class daily                                                                                                                        |
| A1.3               | None – added question for further clarity on demographics                  | A1.3. How many classes are there per grade/ age group?                                                                                                                              |
| A3                 | None – added question for further clarity on demographics                  | A3. If no, please describe how children are split up at different times based on the ages they play on the outdoor play space                                                       |
| A4                 | Expert 5 – 0 for degree of clarity<br>Expert 5 – 0 for degree of ambiguity | A4. What is the ratio of teachers/ staff to children during supervision of outdoor play time?                                                                                       |

|    |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B4 | Expert 4 – 0 for degree of relevance                               | <p>B4. Please select the natural resources that are found in the outdoor play space at the ECD centre that might allow for further sensory exploration (touch, smell, hear, see, or even taste)</p> <ol style="list-style-type: none"> <li>1, Trees</li> <li>2, Plants</li> <li>3, Vegetable or herb gardens</li> <li>4, Flower gardens</li> <li>5, Tree stumps or logs</li> <li>6, Rocky area</li> <li>7, Sandy area</li> <li>8, Natural/ semi-natural water features (streams, ponds, dams etc)</li> <li>9, There are no natural aspects in the outdoor play space</li> <li>10, Other (please specify)</li> </ol> |
| B5 | All scores -1 but improved clarity in relation to B4 and section D | <p>B5. Please select any other outdoor play area resources that are found in the outdoor play space at the ECD centre that might allow for further sensory exploration (touch, smell, hear, see, or and even taste)</p> <ol style="list-style-type: none"> <li>1, Sandpit area</li> <li>2, Muddy area/ mud kitchen</li> <li>3, Water station with water taps or hose pipes for water play</li> <li>4, Messy play or touch exploration station</li> <li>5, None of the above</li> <li>6, Other (please describe)</li> </ol>                                                                                          |
| D3 | Expert 1- 0 for degree of clarity and simplicity                   | <p>D. How much do you agree with the statements below:</p> <p>D3. The outdoor play space at the ECD centre has a sensory environment that offers adequate invitation to the children for play (this includes opportunities to move, feel, see, hear, smell and even taste)</p>                                                                                                                                                                                                                                                                                                                                      |
| D4 | Expert 1- 0 for degree of ambiguity                                | <p>D. How much do you agree with the statements below:</p> <p>D3. The amount and configuration of the outdoor space at the ECD centre supports the activities of the player (i.e., is the size big enough and the layout appropriately spread out enough for the children to play happily?)</p>                                                                                                                                                                                                                                                                                                                     |
| D5 | Expert 5 – 0 for degree of ambiguity                               | <p>D. How much do you agree with the statements below:</p> <p>D5. The outdoor play space is supporting all children's rights to play and freedom to play opportunities (i.e., every child has the right to play- do you agree that the outdoor play space allows for a child to feel free to play without restrictions/ limitations?)</p>                                                                                                                                                                                                                                                                           |
| D8 | Expert 4- 0 for degree of clarity, simplicity, and ambiguity       | <p>D. How much do you agree with the statements below:</p> <p>D8. The natural/ fabricated objects in the outdoor play space support the activity of the player (i.e. the natural</p>                                                                                                                                                                                                                                                                                                                                                                                                                                |

|         |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                       |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |                                                                                                                                                                                                                                                                                                                                    | and manufactured resources described in section B above)                                                                                                                                                                                                                                                                                                              |
| D9      | Expert 4- 0 for degree of clarity, simplicity, and ambiguity                                                                                                                                                                                                                                                                       | D. How much do you agree with the statements below:<br>D9. The play materials support the child's development of age-appropriate fine motor manipulation, construction, purpose and attention (i.e. does the space allow for the child to use his/her hands to create purposeful end-products tools and materials?)                                                   |
| D13     | Expert 4- 0 for degree of clarity, simplicity and ambiguity                                                                                                                                                                                                                                                                        | D. How much do you agree with the statements below:<br>D13. The outdoor play place supports the player's participation in developmentally-appropriate type of play (i.e. does the play space support the physical, social, and emotional skills expected for the child's developmental age?)                                                                          |
| D16     | Expert 5- 0 for degree of simplicity and ambiguity                                                                                                                                                                                                                                                                                 | D. How much do you agree with the statements below:<br>The outdoor play space provides for adequate space for flow of vigorous physical activity (i.e. do the children have enough space to move around the play space and around each other quickly and easily?)                                                                                                     |
| Comment | Expert 1: "I wonder if Covid restrictions might impact people's responses to this question - it might be helpful to comment on whether currently or before COVID?"                                                                                                                                                                 | COMPONENT B, C and D: * Please answer all questions based on the <u>current</u> outdoor play space/s and not how it may have been restricted during the COVID-19 regulations<br><br>A11. Were the outdoor play space/s at the ECD centre changed or restricted in any way during the 2020 and 2021 South African COVID-19 regulations?<br><br>If yes, please describe |
| Comment | Expert 4: "Great in depth questions but some of the language could be simplified for better understanding."                                                                                                                                                                                                                        | All above changes for clarity and simplicity in language                                                                                                                                                                                                                                                                                                              |
| Comment | Expert 5: "I think it is an excellent, comprehensive questionnaire. There were only a few questions where it was difficult to give one answer, as our ECD has two different playgrounds depending on the ages of the children. This means that the layout and type of equipment, height of equipment is different to cater for the | A10. How many different/separate outdoor play spaces are there at your ECD centre? (e.g., depending on the age groups/ grades of the children)<br>1, 1<br>2, 2<br>3, 3<br>4, 4<br>5, 5<br>6, More than 5<br><br>*Changed all questions wording to outdoor play space/s                                                                                                |

|  |                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>specific ages. Other than that, I think it is well thought-out and researched.”</p> | <p><b>COMPONENT E- OUTDOOR PLAY SPACE PHOTOGRAPH PERMISSIONS &amp; ECD CENTRE VISIT PERMISSION</b></p> <p>E1. If you are able to upload photographs of the outdoor play space/s, equipment, resources, and other physical aspects of the environment at your ECD centre (<u>without</u> children), please may you attach these below:</p> <p>E2. Do you give permission to the researcher to visit your ECD centre to take photographs of the outdoor play space (without children) to obtain further visual information to support this research study?</p> <p>If yes, please offer the address of the ECD centre, a contact person to arrange with, and an appropriate time in the day to visit:</p> <p>Question D19: The outdoor play space/s allow for inclusivity of children of all abilities</p> |
|--|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



Signature

Lara Clarkson

Student Name & Surname

## Appendix J: Final Online Redcap Questionnaire for Data Collection

Page 1

### A comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg

Good Day,

I am Occupational Therapist, Lara Clarkson completing a master's degree in Occupational Therapy at the University of the Witwatersrand. The title of my study is as follows:

A comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg. Play is fundamental to early childhood development, health and well-being. It is widely accepted that play spaces and environmental opportunities to play, add to the development of play as a child's primary occupation. Therefore, the purpose of this study is to determine the physical design and quality of the outdoor play spaces of early childhood development (ECD) centres in high and low socioeconomic environments in Johannesburg, to describe whether there are differences or similarities between these outdoor play spaces, and to give recommendations for outdoor play space design based on these findings.

I am inviting you to take part in the research study described above and would be most grateful if you would consider participating in this work on behalf of your ECD centre.

The study will be conducted by means of a questionnaire. I would appreciate your participation by taking a few minutes of your time to answer the questions. The questions will require some reflection of the specific aspects of the outdoor play space at your ECD centre. The questionnaire should not take longer than 15 minutes to complete.

This study should reveal results that are helpful in developing solutions for more effective ways of using limited play space, resources and access to support children's development in outdoor play spaces in Johannesburg and potentially applied for other cities and towns in South Africa. This information can potentially also be used to investigate beneficial improvements for community and school playground design in low and high socioeconomic status schools to help boost children's development in South Africa. You, as a participant in this study, will be given pertinent information on the study while involved in the project as well as after the results are available. Data will be kept for two years if published or six years if not published, after this period the data will be destroyed.

The research study will in no way put a participant at risk or in harm's way and all aspects have been explored to ensure this. Participation is voluntary. Refusal to participate will involve no penalty. You may also withdraw from participating in the study at any time without repercussions. Furthermore, concerted efforts will be made to keep your ECD centre's personal information confidential. The identity of the centre will not be disclosed to anyone and this will be ensured by referring to all research participants (ECD centres) by participant number only with the online questionnaire being on a safe and secure platform.

If you have any queries or concerns or would like further clarity, more information may be obtained from Lara Clarkson at email address clarkson.lara@gmail.com.

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research. If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Professor Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za.

Please complete the survey below.

Thank you!

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### Inclusion Criteria

Please only fill in this questionnaire if you meet the following inclusion criteria for this research study: ☐ Yes ☐ No

1. You are the principal or head teacher at a registered ECD centre for children age six months to six years in the Johannesburg region
2. To the best of your knowledge, you feel that your ECD centre falls either within a low socioeconomic status or in a high socioeconomic status in the greater Johannesburg region

Do you meet the above criteria?

Thank you very much for your willingness to participate in this study.

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**COMPONENT A - DEMOGRAPHICS WITHIN EARLY CHILDHOOD DEVELOPMENT CENTRE OUTDOOR PLACES**

A1.1 How many children in total are currently attending the ECD centre daily?

☐ 0-10  
☐ 11-20  
☐ 21-30  
☐ 31-40  
☐ 41-50  
☐ 51-60  
☐ 61-70  
☐ 71-80  
☐ 81 or more

---

A1.2. How many children are there on average currently per class daily?

☐ 0-5  
☐ 6-10  
☐ 11-15  
☐ 16-20  
☐ 21-25  
☐ 26-30  
☐ 31 or more children per class

---

A1.3. How many classes are there currently per grade/ age group?

☐ 1  
☐ 2  
☐ 3  
☐ 4  
☐ 5 or more

---

A2. What is the age range of children that are currently attending the ECD centre?

\_\_\_\_\_

---

A3. Do all ages of children at the ECD centre play on the same outdoor play space at the same time?

☐ Yes  
☐ No

---

If no, please describe how children are split up at different times based on the ages they play on the outdoor play space:

\_\_\_\_\_

---

A4. What is the ratio of teachers/ staff to children during supervision of outdoor play time currently?

☐ 1 teacher to 5 children  
☐ 1 teacher to 10 children  
☐ 1 teacher to 15 children  
☐ 1 teacher to 20 children  
☐ Other

---

If other, please describe:

\_\_\_\_\_

---

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A5. What category/ categories does your ECD centre fall into?

☐ Independent/ private school  
☐ Community-based site  
☐ Public ordinary school  
☐ Special school (for children with special educational needs)  
☐ Remedial school (for children with remedial learning needs)  
☐ Other

---

If other, please describe:

\_\_\_\_\_

---

A6. Furthermore, how is your ECD centre funded?

☐ Privately funded  
☐ Government funded (by Department of Social Development or Department of Education)  
☐ Charity/ non-governmental/ non-profit organisation funded  
☐ Other

---

If other, please describe:

\_\_\_\_\_

---

A7. To the best of your knowledge, which category would you place your ECD centre in in terms of its socioeconomic position?

☐ Low socioeconomic status  
☐ High socioeconomic status

---

A8. How often does the outdoor play space at your ECD centre receive funding for improvement of the space, playground equipment, materials or toys in the outdoor environment?

☐ Every 6 months  
☐ Annually  
☐ Every 2 years  
☐ Every 3 years  
☐ Other

---

If other, please describe:

\_\_\_\_\_

---

A9. How much time during the school day do children play in the outdoor play space at the ECD centre?

\_\_\_\_\_

---

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A10. How many different/separate outdoor play spaces are there at your ECD centre? (e.g., depending on the age groups/ grades of the children)

- ☐ 1  
☐ 2  
☐ 3  
☐ 4  
☐ 5  
☐ More than 5

A11. Were the outdoor play space/s at the ECD centre changed or restricted in any way during the 2020 and 2021 South African COVID-19 regulations?

- ☐ Yes  
☐ No

If yes, please describe:

\_\_\_\_\_

## COMPONENT B - TYPE OF OUTDOOR PLAY SPACE/S, PLAY SPACE EQUIPMENT & RESOURCES

**\* Please answer all questions based on the current outdoor play space/s and not how it may have been restricted during the COVID-19 regulations**

B1. What type of playground would best describe the outdoor play space/s at the ECD centre?

- ☐ Traditional playground (playground with predominantly fixed manufactured playground structures)  
☐ Natural playground (playground with majority elements in the natural environment for structures such as trees and logs, minimal manufactured structures and more natural or prefabricated loose/ movable materials)  
☐ Creative or adventure playground (playground with opportunities for various types of creative play, exploration and movement, various areas to play in with semi-private spaces, and prefabricated loose/ movable materials that are multi-purpose)  
☐ The outdoor play space only has no playground structures or natural elements, but rather only a concrete/ sand space outdoors  
☐ There is no outdoor play space at the ECD centre  
☐ Other

If other, please describe:

\_\_\_\_\_

B2. If there are fixed manufactured playground structures in the outdoor play space/s, what materials are they predominantly made of?

- ☐ Wood  
☐ Plastic  
☐ Steel  
☐ Aluminium  
☐ There are no fixed manufactured playgrounds structures at the ECD centre

B3. Please select the manufactured playground equipment found in the outdoor play space/s at the ECD centre that the children can move on:

- ☐ Linear swings (swings that swing forward and back)  
☐ Rotational swings (swings that swing in more circular movement from one point)  
☐ Loose tyres to climb through or roll around  
☐ Fixed tyres in the ground for children to walk on  
☐ Merry-go-round  
☐ Seesaw  
☐ Monkey bars  
☐ Climbing jungle gym  
☐ Fireman pole  
☐ Slide  
☐ Tunnel  
☐ Trampoline  
☐ Bridge  
☐ There is no manufactured playground equipment  
☐ Other

If other, please describe:

\_\_\_\_\_

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B4. Please select the natural resources that are found in the outdoor play space/s at the ECD centre that might allow for further sensory exploration (move, touch, smell, hear, see, or even taste):

- ☐ Trees
- ☐ Plants
- ☐ Vegetable or herb gardens
- ☐ Flower gardens
- ☐ Tree stumps or logs
- ☐ Rocky area
- ☐ Sandy area
- ☐ Natural/ semi-natural water features (streams, ponds, dams etc)
- ☐ There are no natural aspects in the outdoor play space
- ☐ Other

If other, please describe:

---

B5. Please select any other outdoor play area resources that are found in the outdoor play space/s at the ECD centre that might allow for further sensory exploration (move, touch, smell, hear, see, or even taste):

- ☐ Sandpit area
- ☐ Muddy area/ mud kitchen
- ☐ Water station with water taps or hose pipes for water play
- ☐ Messy play or touch exploration station
- ☐ None of the above
- ☐ Other

If other, please describe:

---

B6. Please select the manufactured loose/ moveable materials found in the outdoor play space/s at the ECD centre with which the children can construct or engage creatively with:

- ☐ Buckets and spades
- ☐ Pots and pans
- ☐ Plastic piping
- ☐ String/ fabric/ netting
- ☐ Recycled materials
- ☐ Tyres
- ☐ Soft playground equipment such as soft blocks, half moons or wedges
- ☐ None of the above
- ☐ Other

If other, please describe:

---

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B7. Please select the natural loose/ moveable materials found in the outdoor play space/s at the ECD centre with which the children can construct or engage creatively with:

- ☐ Sand
- ☐ Water
- ☐ Twigs/ Branches
- ☐ Logs
- ☐ Pebbles/ Stones
- ☐ Shells
- ☐ Pine cones
- ☐ None of the above
- ☐ Other

If other, please describe:

---

B8. Please select the manufactured loose/moveable materials found in the outdoor play space/s at the ECD centre that the children can move with:

- ☐ Balls
- ☐ Scooters/ pushbikes/ tricycles
- ☐ Skipping rope
- ☐ Bats/ rackets
- ☐ Swing ball
- ☐ Wheelbarrow
- ☐ Ladders
- ☐ Bucket stilts
- ☐ Hoppy balls
- ☐ None of the above
- ☐ Other

If other, please describe:

---

B9. Please select whether the outdoor play space/s has any type of quiet or semi-private space that allows for quiet time:

- ☐ Tree house
- ☐ Wendy house
- ☐ Tunnel
- ☐ Cave
- ☐ Quiet corner
- ☐ Tent
- ☐ None of the above
- ☐ Other

If other, please describe:

---

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B10. Please select the types of creative or adventure spaces there are for children's creative play in the outdoor play space/s:

- ☐ Fairy garden
- ☐ Winding paths
- ☐ Mazes
- ☐ Secret tunnels
- ☐ Digging areas or scratch patches
- ☐ None of the above
- ☐ Other

---

If other, please describe:

\_\_\_\_\_

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**COMPONENT C - OTHER PHYSICAL CHARACTERISTICS OF OUTDOOR PLAY SPACE/S**

**\* Please answer all questions based on the current outdoor play space/s and not how it may have been restricted during the COVID-19 regulations**

C1. Please select the type/s of terrain that can be found in the outdoor play space/s at the ECD centre?

- ☐ Grass
- ☐ Sand
- ☐ Concrete
- ☐ Bricks
- ☐ Bark chips
- ☐ Recycled rubber
- ☐ Gravel
- ☐ Astroturf/ plastic grass
- ☐ Other

---

If other, please describe:

\_\_\_\_\_

C2. Please select the estimated size of the outdoor play space/s at the ECD centre:

- ☐ 0-20 square metres
- ☐ 21-50 square metres
- ☐ 51-100 square metres
- ☐ 101-150 square metres
- ☐ 151-200 square metres
- ☐ Bigger than 200 square metres

---

C3. Is there any natural or manufactured shade cover for the children in the outdoor play space/s at the ECD centre?

- ☐ Yes
- ☐ No

---

C4. Please select the maximum height of the fixed manufactured playground equipment in the outdoor play space/s at the ECD centre:

- ☐ 0-1 metre
- ☐ 1-2 metres
- ☐ 2-3 metres
- ☐ 3-4 metres
- ☐ 4-5 metres
- ☐ Above 5 metres
- ☐ There is nothing with height in the outdoor play space

---

C5. If there are fixed manufactured playground structures, what type of terrain lies underneath these to ensure safety should the children fall?

- ☐ Grass
- ☐ Sand
- ☐ Recycled rubber
- ☐ Bark chips
- ☐ None of the above
- ☐ Other

---

If other, please describe:

\_\_\_\_\_

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C6. Is there access to a nearby water source or tap near the outdoor play space/s for the children to drink safe drinking water?

☐ Yes  
☐ No

---

C7. Is there close access to a bathroom area from the outdoor play space/s for the children to go to the toilet?

☐ Yes  
☐ No

---

C8. Is there a safe storage facility for loose parts/ moveable materials during non-school hours?

☐ Yes  
☐ No

---

C9. Please select the type of security boundaries there are around the outdoor play space/s at the ECD centre:

☐ Brick walls  
☐ Electric fence  
☐ Alarm system  
☐ Plastic/ steel/ wooden fencing  
☐ Barbed wire  
☐ Trees or plants  
☐ None of the above  
☐ Other

---

If other, please describe:

\_\_\_\_\_

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**COMPONENT D- SUBJECTIVE VIEW THE OUTDOOR PLAY SPACE/S**

**Adapted from Bronson & Bundy's Test of Environmental Supportiveness (2001), from the Revised Knox Preschool Play Scale (1968), and from Ayres Sensory Integration fidelity measure structural elements (Parham et. al, 2007)**

**\* Please answer all questions based on the current outdoor play space/s and not how it may have been restricted during the COVID-19 regulations**

**D. How much do you agree with the statements below:**

|                                                                                                                                                                                                                            | Strongly Agree        | Agree                 | No opinion            | Disagree              | Strongly Disagree     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space/s at the ECD centre is physically safe                                                                                                                                                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The outdoor play space/s at the ECD centre is accessible and inclusive for all children                                                                                                                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The outdoor play space/s at the ECD centre has a sensory environment that offers adequate invitation to the children for play (this includes opportunities to move, feel, see, hear, smell and even taste)                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The amount and configuration of the outdoor space/s at the ECD centre supports the activities of the player (i.e. is the size big enough and the layout appropriately spread out enough for the children to play happily?) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The outdoor play space/s is supporting all children's rights to play and freedom to play opportunities                                                                                                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The outdoor play space/s at the ECD centre has sufficient space for all the children to play freely                                                                                                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The outdoor play space/s, resources and equipment supports age-appropriate gross motor developmental milestones                                                                                                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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# Comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg

| The natural/ fabricated objects in the outdoor play space/s support the activity of the player (i.e. the natural and manufactured resources described in section B above)                                                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The play materials support the child's development of age-appropriate fine motor manipulation, construction, purpose and attention                                                                                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The outdoor play space/s is regularly checked and maintained for safety, health or security hazards to protect the children                                                                                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| There is sufficient storage for the safekeeping of the outdoor play space/s loose/ moveable materials                                                                                                                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| There is sufficient play time during the school day for children to play freely in the outdoor play space/s                                                                                                                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The outdoor play space/s supports the player's participation in developmentally-appropriate type of play (i.e. does the play space support the physical, social, and emotional skills expected for the child's developmental age?) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The caregivers in the outdoor play space/s promote player's activities and play opportunities and do not interfere with the player's activities and play opportunities                                                             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The caregivers in the outdoor play space/s adhere to reasonable and consistent boundaries/ rules for the children in the play space                                                                                                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| The outdoor play space/s provides for adequate space for flow of vigorous physical activity (i.e. do the children have enough space to move around the play space and around each other quickly and easily?) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| The outdoor play space/s is regularly and routinely monitored for ensuring safety regulations                                                                                                                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The outdoor play space/s allows for variety of play, creativity, spontaneity, continued interest and fun for all players                                                                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The outdoor play space/s allows for inclusivity of children of ALL abilities                                                                                                                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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**COMPONENT E- OUTDOOR PLAY SPACE/S PHOTOGRAPH PERMISSION & ECD CENTRE VISIT PERMISSION**

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E1. If you are able to upload photographs of the current outdoor play space/s, equipment, resources, and other physical aspects of the environment at your ECD centre (without children), please may you attach these below:

---

E2. Do you give permission to the researcher to visit your ECD centre to take photographs of the outdoor play space (without children) to obtain further visual information to support this research study?

☐ Yes  
☐ No

---

If yes, please offer the address of the ECD centre, a contact person to arrange with, and an appropriate time in the day to visit:

---

Thank you very much for your participation in this study. Your contribution is greatly appreciated.

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## Appendix K: Results and Data Analysis – Summary of Component A

**Appendix Table 3. A table outlining a summary of the results & data analysis of component A**

| Characteristics                     |                 | Total | Low ECD (freq) | Low ECD (%) | High ECD (freq) | High ECD (%) |
|-------------------------------------|-----------------|-------|----------------|-------------|-----------------|--------------|
| N: number of ECD centres            |                 | 82    | 28             | 34%         | 54              | 66%          |
|                                     | <b>Category</b> |       |                |             |                 |              |
| <b>Number of children in centre</b> | 0-10            | 2     | 2              | 7%          | 0               | 0%           |
|                                     | 11-20           | 8     | 4              | 14%         | 4               | 7%           |
|                                     | 21-30           | 8     | 4              | 14%         | 4               | 7%           |
|                                     | 31-40           | 11    | 4              | 14%         | 7               | 13%          |
|                                     | 41-50           | 16    | 7              | 25%         | 9               | 17%          |
|                                     | 51-60           | 9     | 0              | 0%          | 9               | 17%          |
|                                     | 61-70           | 6     | 2              | 7%          | 4               | 7%           |
|                                     | 71-80           | 6     | 1              | 4%          | 5               | 9%           |
|                                     | 81 or More      | 16    | 4              | 14%         | 12              | 22%          |
|                                     |                 |       | Check          | 100%        |                 | 100%         |
| <b>Class size</b>                   | 0-5             | 2     | 1              | 4%          | 1               | 2%           |
|                                     | 6-10            | 13    | 4              | 15%         | 9               | 17%          |
|                                     | 11-15           | 28    | 11             | 41%         | 17              | 33%          |
|                                     | 16-20           | 22    | 5              | 19%         | 17              | 33%          |
|                                     | 21-25           | 9     | 4              | 15%         | 5               | 10%          |
|                                     | 26-30           | 3     | 2              | 7%          | 1               | 2%           |
|                                     | 31 or more      | 2     | 0              | 0%          | 2               | 4%           |
|                                     |                 |       | Check          | 100%        |                 | 100%         |
| <b>Classes per age group</b>        | 1               | 32    | 9              | 33%         | 23              | 43%          |
|                                     | 2               | 17    | 2              | 7%          | 15              | 28%          |
|                                     | 3               | 16    | 9              | 33%         | 7               | 13%          |
|                                     | 4               | 9     | 5              | 19%         | 4               | 7%           |
|                                     | 5               | 7     | 2              | 7%          | 5               | 9%           |
|                                     |                 |       | Check          | 100%        |                 | 100%         |
| <b>Age range: minimum age</b>       | 1               | 9     | 3              | 12%         | 6               | 11%          |
|                                     | 3               | 4     | 0              | 0%          | 4               | 8%           |
|                                     | 4               | 1     | 1              | 4%          | 0               | 0%           |
|                                     | 6               | 13    | 8              | 32%         | 5               | 9%           |
|                                     | 8               | 1     | 0              | 0%          | 1               | 2%           |
|                                     | 9               | 2     | 0              | 0%          | 2               | 4%           |

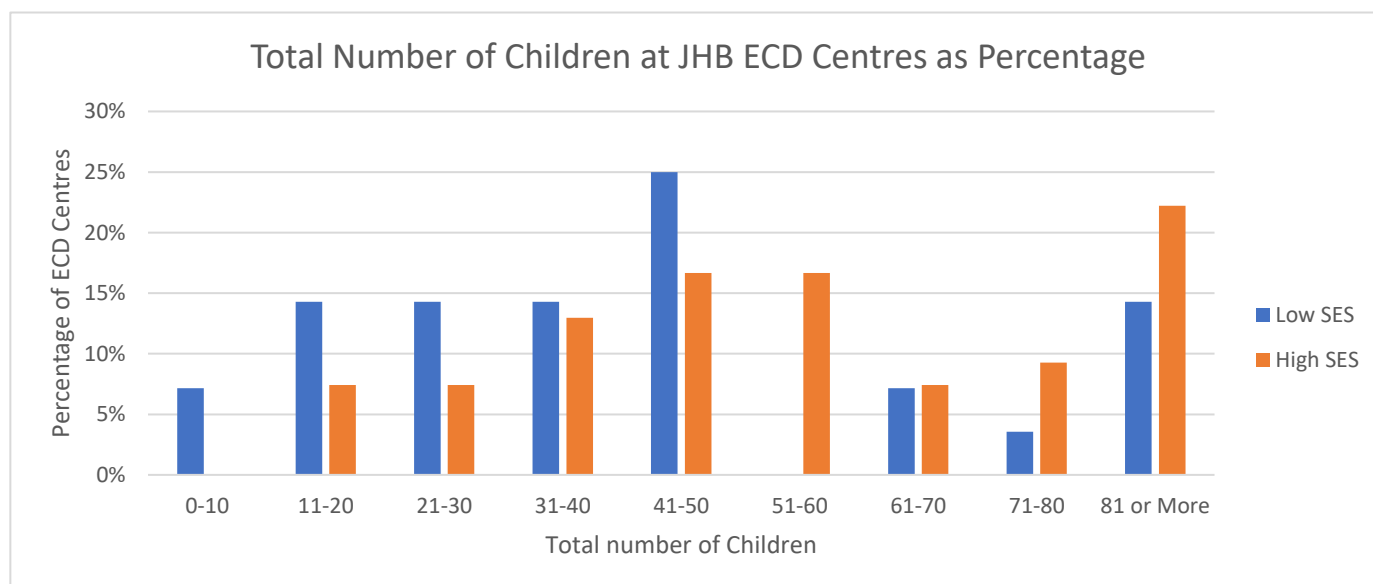
|                                |                            |    |       |      |    |      |
|--------------------------------|----------------------------|----|-------|------|----|------|
|                                | 10                         | 1  | 0     | 0%   | 1  | 2%   |
|                                | 12                         | 17 | 7     | 28%  | 10 | 19%  |
|                                | 15                         | 2  | 0     | 0%   | 2  | 4%   |
|                                | 16                         | 1  | 0     | 0%   | 1  | 2%   |
|                                | 18                         | 9  | 1     | 4%   | 8  | 15%  |
|                                | 24                         | 7  | 2     | 8%   | 5  | 9%   |
|                                | 36                         | 7  | 2     | 8%   | 5  | 9%   |
|                                | 48                         | 3  | 1     | 4%   | 2  | 4%   |
|                                | 60                         | 1  | 0     | 0%   | 1  | 2%   |
|                                |                            |    | Check | 100% |    | 100% |
| <b>Age range: maximum age</b>  | 36                         | 2  | 0     | 0%   | 2  | 4%   |
|                                | 48                         | 2  | 0     | 0%   | 2  | 4%   |
|                                | 60                         | 29 | 10    | 42%  | 19 | 37%  |
|                                | 72                         | 41 | 14    | 58%  | 27 | 53%  |
|                                | 73                         | 1  | 0     | 0%   | 1  | 2%   |
|                                |                            |    | Check | 100% |    | 100% |
| <b>Ages same space</b>         | Yes                        | 31 | 10    | 36%  | 21 | 39%  |
|                                | No                         | 51 | 18    | 64%  | 33 | 61%  |
|                                |                            |    | Check | 100% |    | 100% |
| <b>Ratio teacher: children</b> | 1 teacher to 5 children    | 16 | 3     | 11%  | 13 | 24%  |
|                                | 1 teacher to 10 children   | 29 | 9     | 32%  | 20 | 37%  |
|                                | 1 teacher to 15 children   | 21 | 12    | 43%  | 9  | 17%  |
|                                | 1 teacher to 20 children   | 6  | 1     | 4%   | 5  | 9%   |
|                                | Other                      | 10 | 3     | 11%  | 7  | 13%  |
|                                |                            |    | Check | 100% |    | 100% |
| <b>ECD centre category</b>     | Independent/private school | 51 | 6     | 21%  | 45 | 83%  |
|                                | Community based site       | 22 | 16    | 57%  | 6  | 11%  |
|                                | Public ordinary school     | 2  | 1     | 4%   | 1  | 2%   |
|                                | Special school             | 1  | 1     | 4%   | 0  | 0%   |
|                                | Remedial school            | 0  | 0     | 0%   | 0  | 0%   |
|                                | Other                      | 1  | 1     | 4%   | 0  | 0%   |
|                                | Independent/private school | 2  | 2     | 7%   | 0  | 0%   |

|                                        |                                                               |    |       |      |    |      |
|----------------------------------------|---------------------------------------------------------------|----|-------|------|----|------|
|                                        | & Community based site                                        |    |       |      |    |      |
|                                        | Independent/ private school & Special school                  | 1  | 0     | 0%   | 1  | 2%   |
|                                        | Independent/ private school, Special school & Remedial school | 1  | 0     | 0%   | 1  | 2%   |
|                                        | Independent/ private school & Other                           | 1  | 1     | 4%   | 0  | 0%   |
|                                        |                                                               |    | Check | 100% |    | 100% |
| <b>Funding type</b>                    | Privately funded                                              | 53 | 6     | 21%  | 47 | 87%  |
|                                        | Government funded                                             | 11 | 7     | 25%  | 4  | 7%   |
|                                        | Charity/ NGO/ NPO                                             | 8  | 6     | 21%  | 2  | 4%   |
|                                        | Other                                                         | 10 | 9     | 32%  | 1  | 2%   |
|                                        |                                                               |    | Check | 100% |    | 100% |
| <b>Outdoor space funding frequency</b> | Every 6 months                                                | 7  | 0     | 0%   | 7  | 13%  |
|                                        | Annually                                                      | 31 | 6     | 21%  | 25 | 46%  |
|                                        | Every 2 years                                                 | 7  | 3     | 11%  | 4  | 7%   |
|                                        | Every 3 years                                                 | 5  | 2     | 7%   | 3  | 6%   |
|                                        | Other                                                         | 32 | 17    | 61%  | 15 | 28%  |
|                                        |                                                               |    | Check | 100% |    | 100% |
| <b>Time for outdoor play</b>           | 0-30 minutes                                                  | 2  | 2     | 7%   | 0  | 0%   |
|                                        | 30-60 minutes                                                 | 14 | 9     | 33%  | 5  | 9%   |
|                                        | 1 - 2 hours                                                   | 24 | 10    | 37%  | 14 | 26%  |
|                                        | 2- 3 hours                                                    | 22 | 5     | 19%  | 17 | 31%  |
|                                        | 3-4 hours                                                     | 7  | 0     | 0%   | 7  | 13%  |
|                                        | 4-5 hours                                                     | 6  | 1     | 4%   | 5  | 9%   |
|                                        | 5 or more hours                                               | 6  | 0     | 0%   | 6  | 11%  |
|                                        |                                                               |    | Check | 100% |    | 100% |
| <b>Number of outdoor play spaces</b>   | 1                                                             | 22 | 10    | 36%  | 12 | 22%  |
|                                        | 2                                                             | 34 | 14    | 50%  | 20 | 37%  |
|                                        | 3                                                             | 16 | 2     | 7%   | 14 | 26%  |

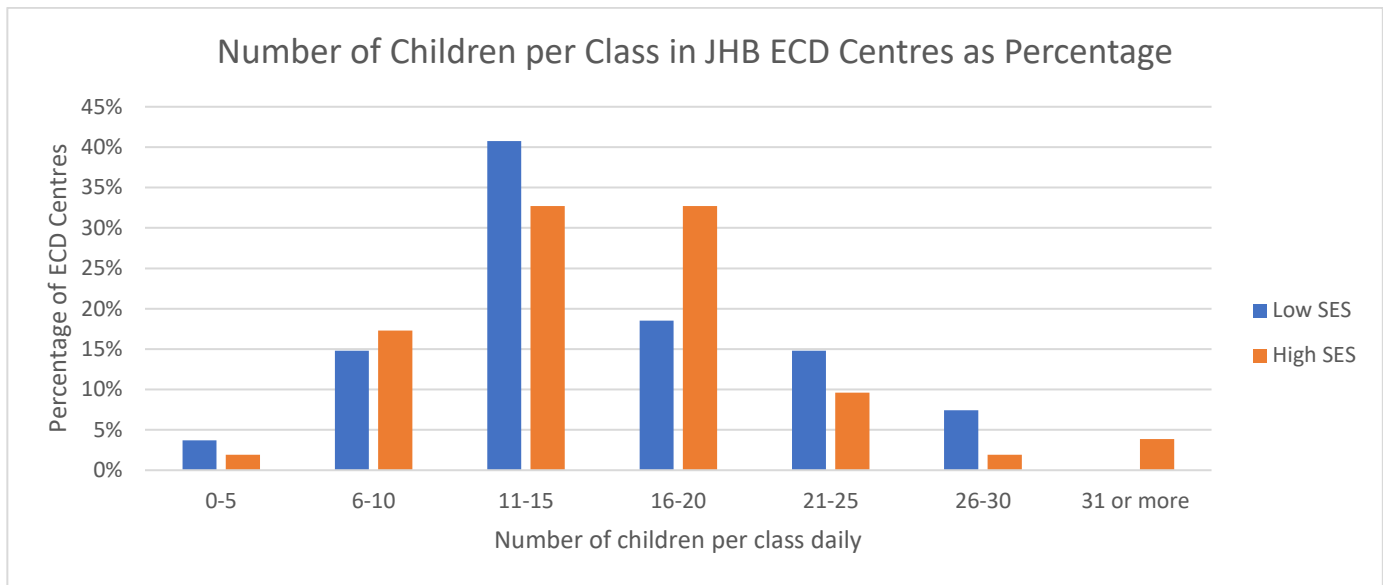
|                           |             |    |       |      |    |      |
|---------------------------|-------------|----|-------|------|----|------|
|                           | 4           | 6  | 0     | 0%   | 6  | 11%  |
|                           | 5           | 2  | 1     | 4%   | 1  | 2%   |
|                           | More than 5 | 2  | 1     | 4%   | 1  | 2%   |
|                           |             |    | Check | 100% |    | 100% |
| <b>Covid restrictions</b> | Yes         | 43 | 13    | 46%  | 30 | 57%  |
|                           | No          |    | 15    | 54%  | 23 | 43%  |
|                           |             |    | Check | 100% |    | 100% |

## Appendix L: Results Visuals – Summary of Component A

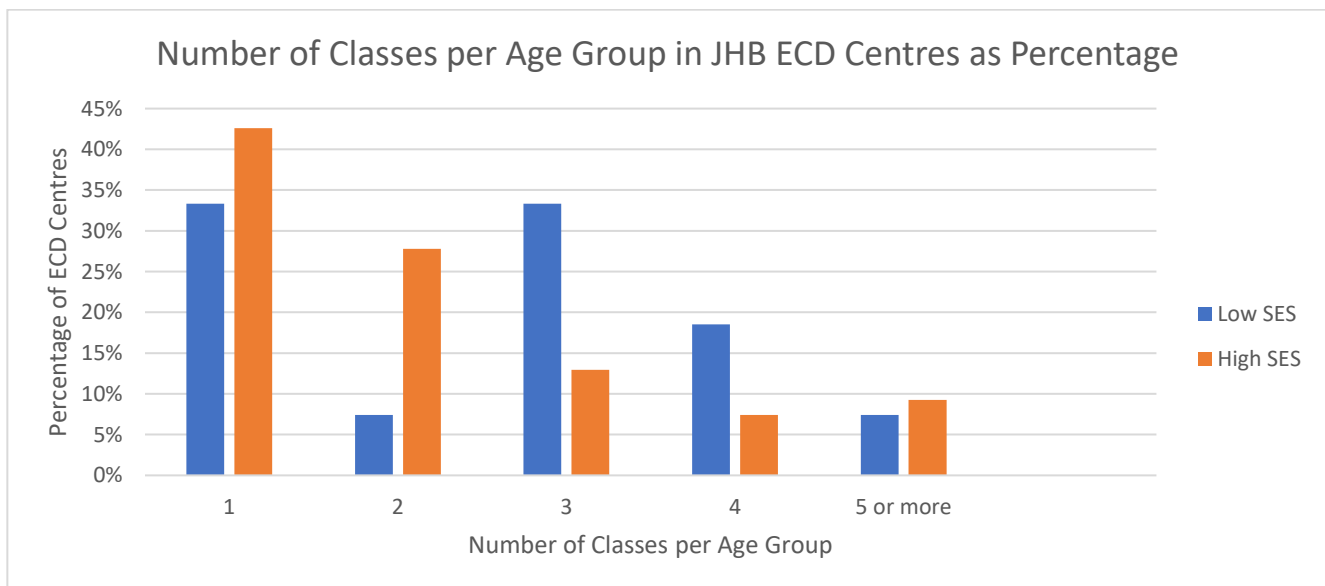
### A1.1- A histogram depicting the total number of children currently attending Johannesburg ECD centres



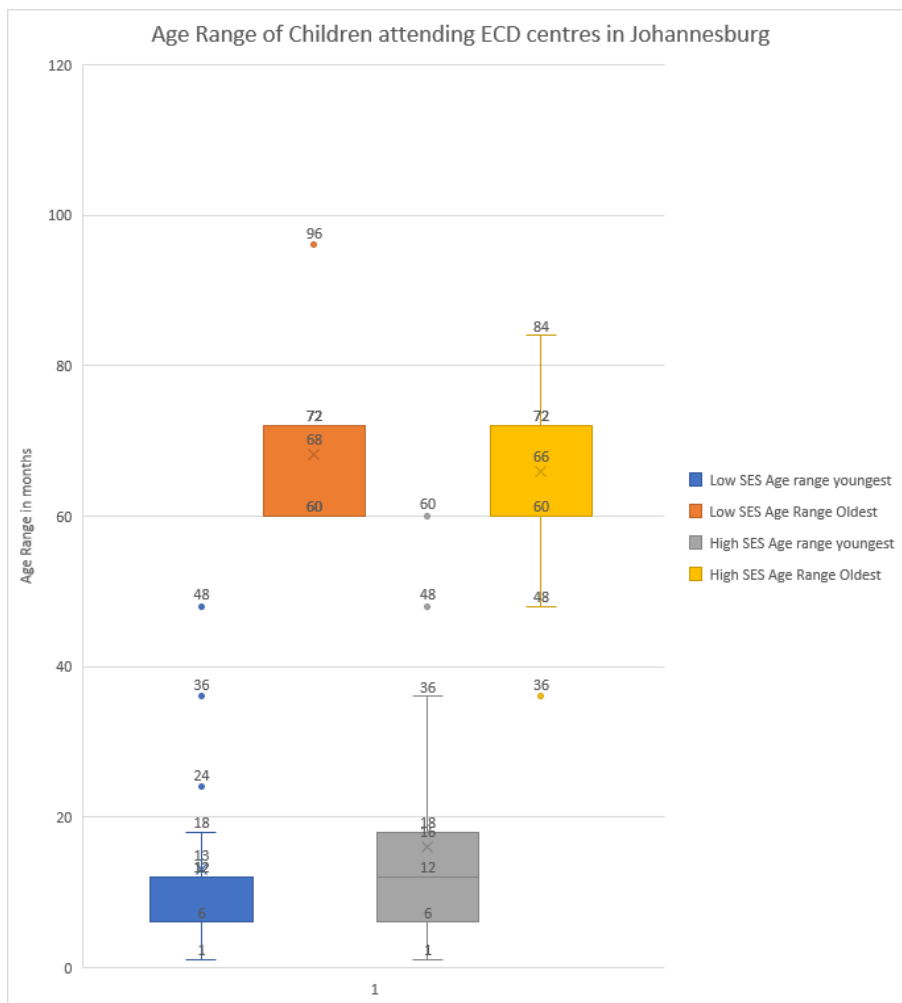
### A1.2 - A histogram depicting the average number of children per class in Johannesburg ECD centres



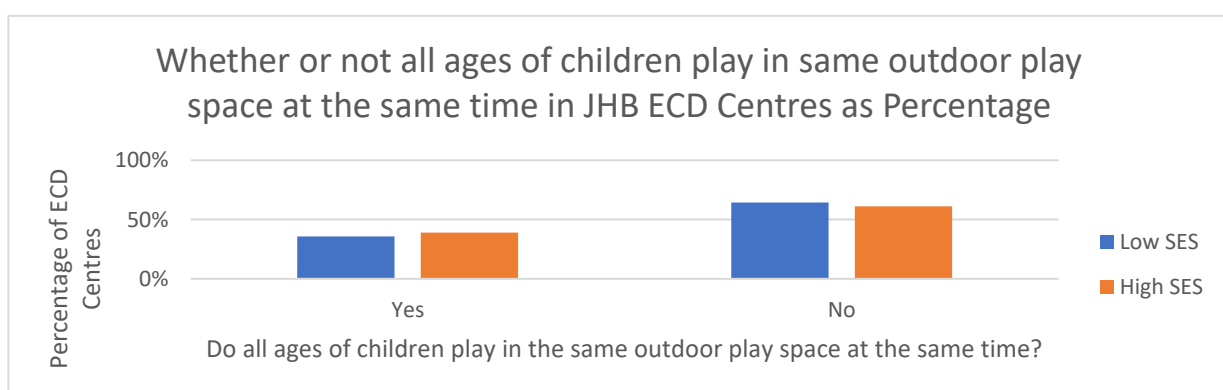
**A1.3 - A histogram depicting the number of classes per age group in Johannesburg ECD centres**



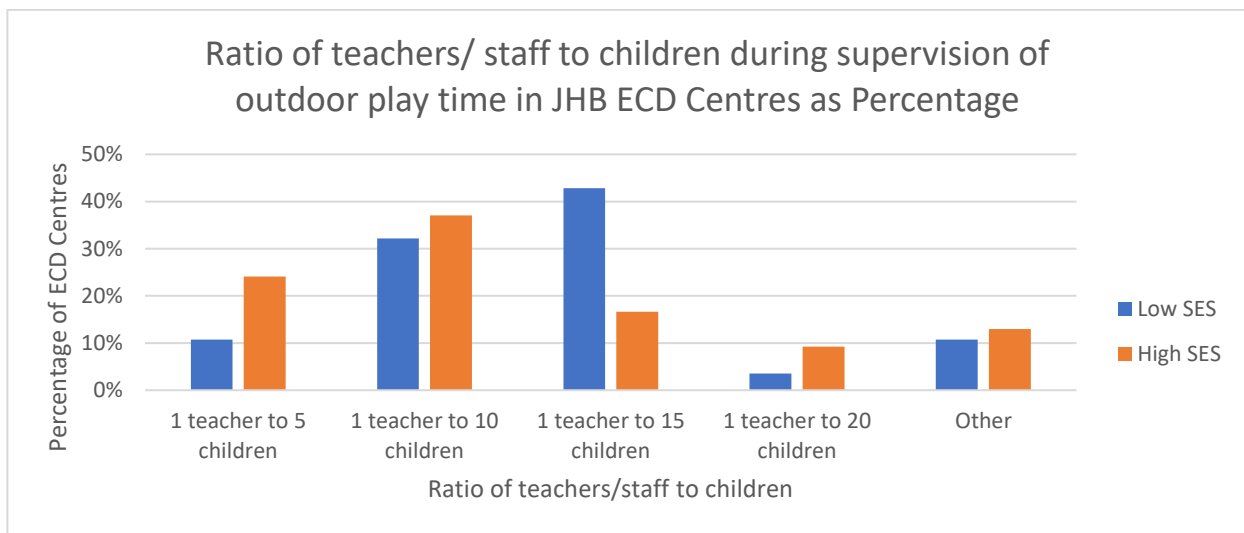
**A2- A box and whisker diagram depicting the age range of children currently attending Johannesburg ECD centres**



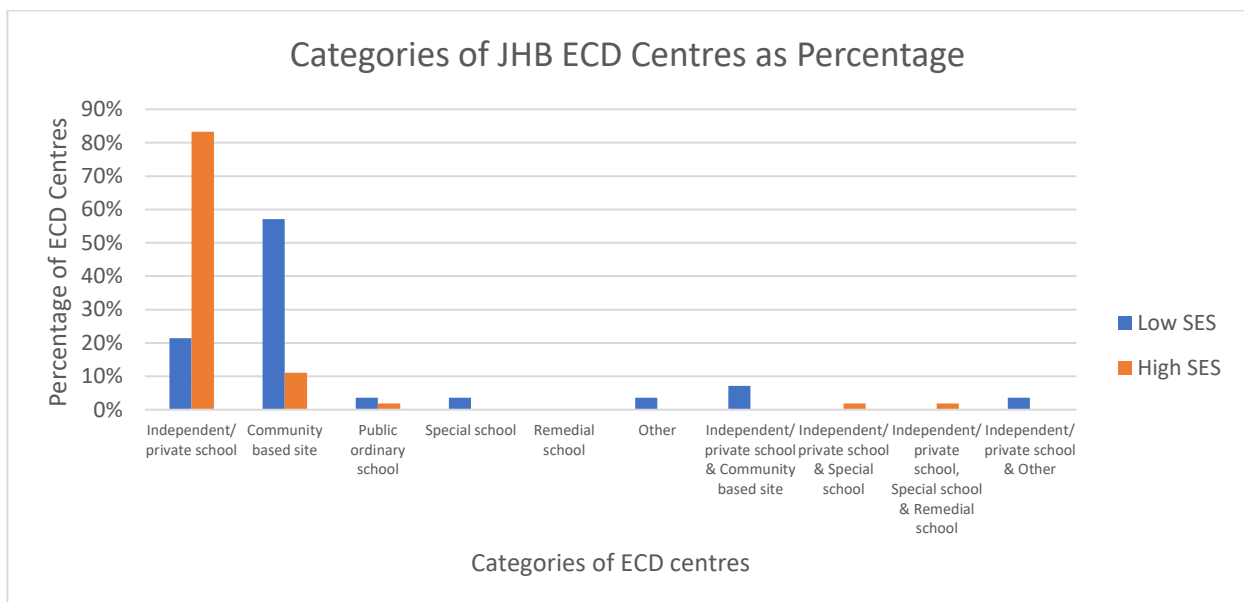
**A3 - A histogram depicting whether or not all ages of children play in the same outdoor play space at the same time in Johannesburg ECD centres**



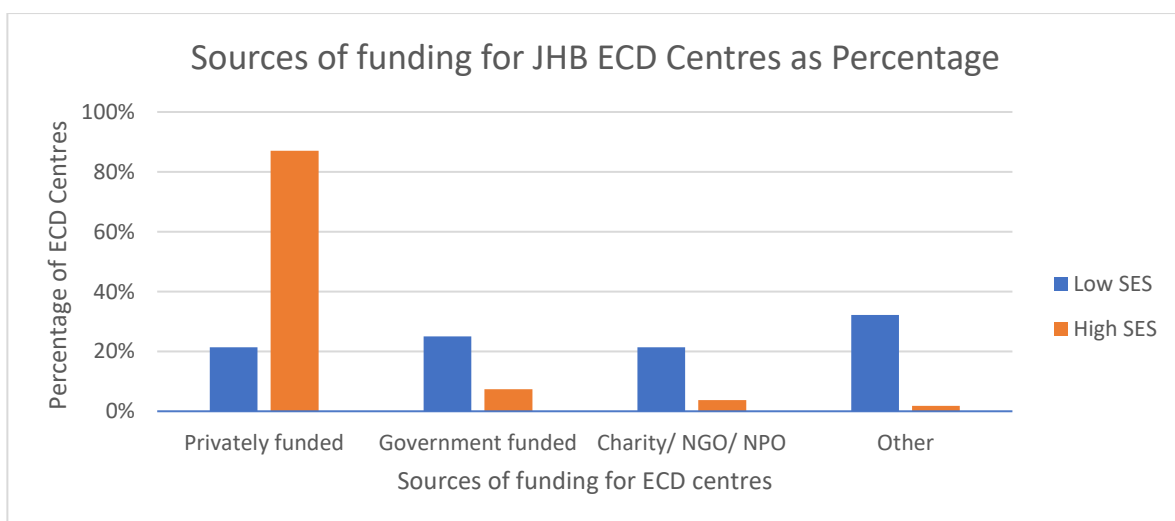
**A4 – A histogram depicting the ratio of teachers/ staff to children during supervision of outdoor play in Johannesburg ECD centres**



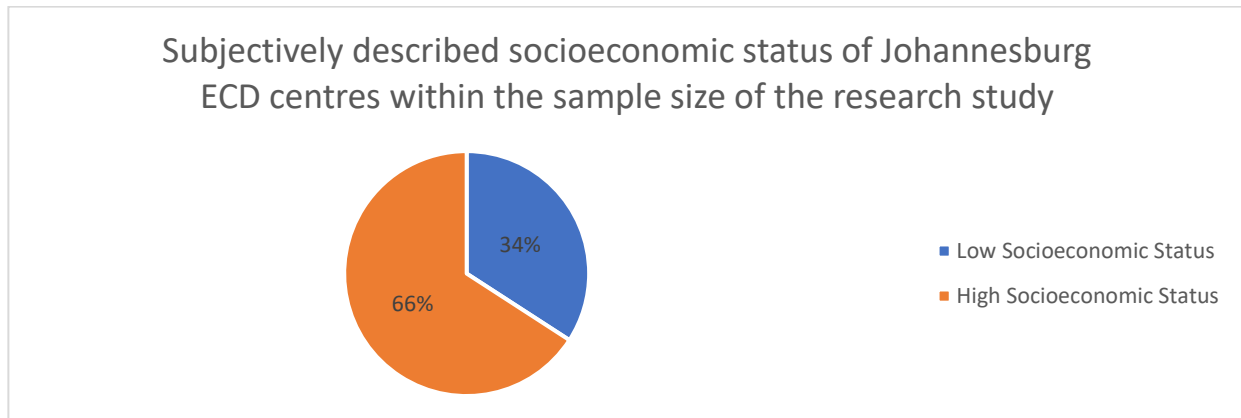
**A5 – A histogram depicting the categories of Johannesburg ECD centres**



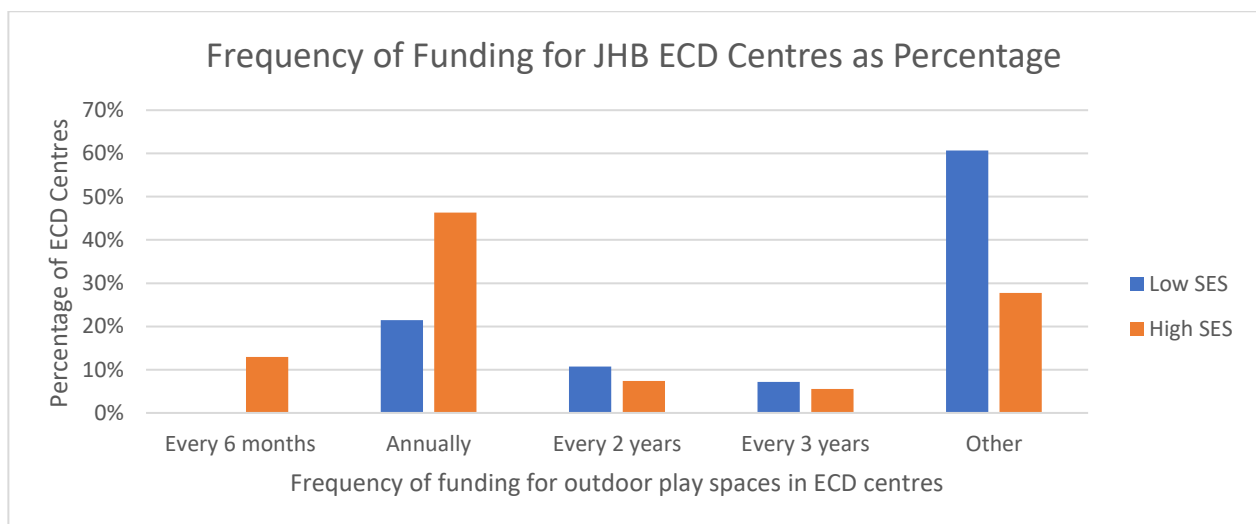
**A6 – A histogram depicting the sources of funding for Johannesburg ECD centres**



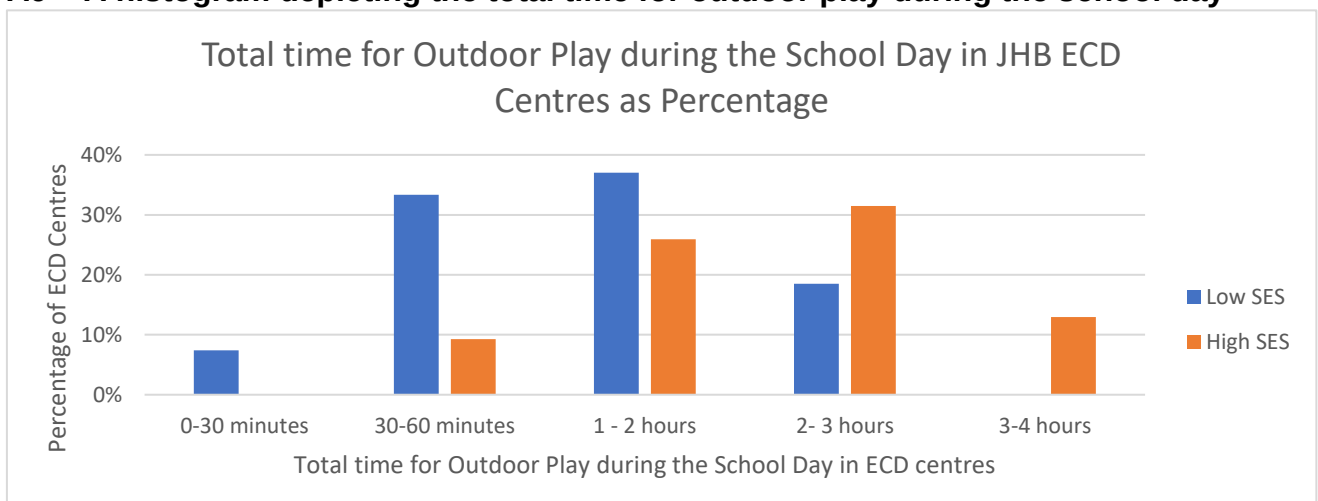
**A7 – A pie chart depicting the subjectively described socioeconomic status of the Johannesburg ECD centres that fell within the sample size**



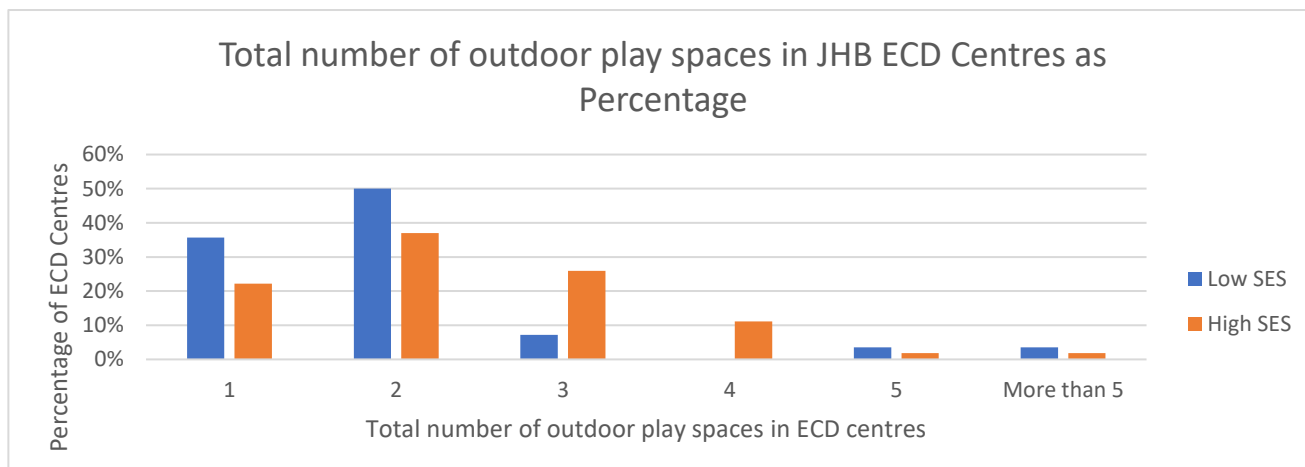
**A8 – A histogram depicting the frequency of funding for Johannesburg ECD centres for improvement of the outdoor play space, playground equipment, materials or toys in the outdoor environment**



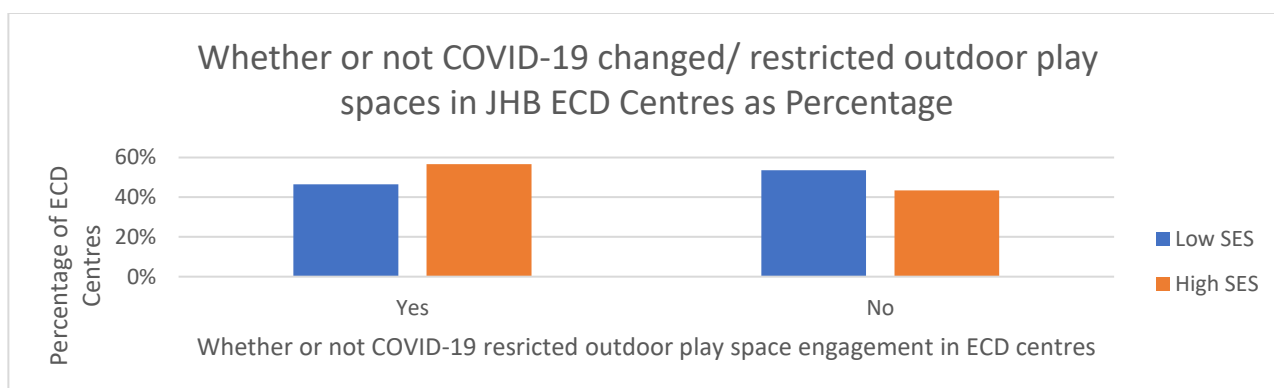
**A9 – A histogram depicting the total time for outdoor play during the school day**



**A10 – A histogram depicting the total number of different/ separate outdoor play spaces at Johannesburg ECD Centres (e.g. depending on the age group/ grades of the children)**



**A11 – A histogram depicting whether or not the South African COVID-19 regulations during 2020 and 2021 changed or restricted outdoor play spaces in Johannesburg ECD centres**



## Appendix M: Results – Content Analysis for Qualitative Data in Component A

- a3\_if\_no: Please describe how children are split up at different times based on the ages they play on the outdoor play space

**Appendix Table 4. A table representing the content analysis for the qualitative data in component A**

| <b>Age Group Categories found in both low and high socioeconomic ECD centres</b>                                                         | <b>Colour Code</b>                                          | <b>Frequency out of 55 age groups specified within description</b> | <b>Percentage out of total</b>                 |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|
| "Babies", "baby", "0-1", "creche"                                                                                                        | Purple                                                      | 10                                                                 | 18.1%                                          |
| "Toddlers" or "toddler", "1-3" year olds, "18 months – 3" years old; 2-3 year olds                                                       | Yellow (not counted twice per description if more than one) | 20                                                                 | 36.4%                                          |
| 4-5 year olds, 4-6 year olds, 3-6/7 year olds, 3-5 year olds, "pre-grade R", "grade R", "Older", "bigger", "preschoolers", 3-4 year olds | Green (not counted twice per description if more than one)  | 20                                                                 | 36.4%                                          |
| Other exceptions to three main groups: 0-3 or "up to 3", "6 months to 2 years"; 2-5 years                                                | Light blue                                                  | 5                                                                  | 9.1%                                           |
|                                                                                                                                          |                                                             | 55                                                                 | 100%                                           |
| <b>How were Age Groups Split</b>                                                                                                         | <b>Number Code</b>                                          | <b>Frequency out of 45 total descriptions</b>                      | <b>Percentage out of 45 total descriptions</b> |
| Ages groups split into different times                                                                                                   | 1                                                           | 13                                                                 | 29%                                            |
| Age groups split into different play grounds/ outdoor play spaces                                                                        | 2                                                           | 17                                                                 | 38%                                            |
| Age groups split into different times and space                                                                                          | 3                                                           | 6                                                                  | 13%                                            |
| Age groups split, unspecified how                                                                                                        | 4                                                           | 9                                                                  | 20%                                            |
|                                                                                                                                          |                                                             | 45                                                                 | 100%                                           |

- 1: We group them different time
- 1: When the babies are sleeping the young ones are doing the out door play
- 2: We have 3 play grounds. 9months - 22 months. 2 year olds and 3 year olds. 4 and 5 year olds
- 4: Children play according to age, from youngest to oldest age groups.
- 4: The play according to their group age 1st group 2 years to 3 years, 2nd group 3/4 years then last group 5/6 years
- 1: They go 30minutes each class
- 4: Babies, ages from 6 months to 2 years play separate from the toddlers and children
- 4: 3- 15 months, 16months- 2,5 years, 3- 7 yrs
- 3: 18 months - 3 years play in one area and the 3 - 6 year olds in another area. The areas are rotated so that the children can play in all the areas within the age groups
- 1: The toddlers go out at 10 to 11.30 and the 3 to 6yrs go out at 10: 30 to 12
- 1: 10am to 10h30am. 10h30am to 11h15am. 11h15am to 12pm
- 4: They take turns
- 4: classes
- 2: They play at different areas during break time
- 1: 18 months to three years play together in one slot. 3 years to five years play together in a seperate slot.
- 2: Two playgrounds. 1 for ages 1-3 only. 2 for ages 2,3,4,5 years. Each age group plays outside for a minimum of 30 minutes, twice a day.
- 1: I have three slots each group play for an hour out doors
- 2: different age groups play in different spaces of the outdoor area
- 2: we have seperate play areas for 0-3 years, 4-5years and Gr Rs
- 3: The younger learners go out together at the same time. (2-3 year olds and 3-4 year olds). The baby centre have their own schedule and play area. The bigger learners are grouped together (4-5 years and 5 - 6 years)
- 1: They alternate times and stick with their age group
- 3: each class has their own outdoor play area. age appropriate. the shared garden and drive is utilised at different times.
- 4: 0-1, 2 years, 3 - 5 years
- 4: per class
- 3: 7am - 8:15 - all children mixed. 8:15 - 09:00 Toddlers on their own playground. 10:30 am snack - Toddlers on their playground, preschoolers on their own playground. Aftercare - 14:30 - 17:30 all ages mixed
- 2: 0-3 are one area and 4-5 in a bigger area
- 3: creche has own playground, 2 + 3 year olds rotate outdoor play time, as well as 4+5 year olds who have a separate playground
- 2: We have a separate outdoor area for the playschool
- 1: babies play from 11 and young children and pre grade play at 11:30
- 1: 0\_3yrs start 9\_10.30am, then 4\_ 6yrs 10 \_30 to 11 30 am
- 2: Smaller children play on their playground

- 1: they split due to the lack of space outside
- 2: 2 separate play spaces. One for up to 3 yrs. The other for 3-6yrs
- 3: We have two separate play areas. The 2.5 years and younger have their own space and also have different break times.
- 2: The profoundly disabled children have their own outdoor space/ play area
- 1: Toddlers go first others follow after
- 2: There are 2 outdoor play areas. One for the babies, toddlers and junior, then the other for pre-grade R.
- 2: toddler playground 13 and big playground 30
- 1: We rotate the playground, 18m-3 yrs and 3yrs -5 yrs are grouped together.
- 2: 2 classes per playground (baby + older playground)
- 4: 18 months - 2 years, and 2-3 years
- 2: different play area for the 2 to 3 year olds
- 2: children aged 12 months- 3 years play on our upper playground while the 3-6 year Olds play on our lower playground. We have similar outdoor times.
- 2: We have four playgrounds
- 2: smaller spaces & equipment for younger children on the same play ground
- other\_a4\_v4: If other ratio of teachers/ staff to children during supervision of outdoor play time, please describe:
  - babies 1 adult per two babies, older 1adult per 8/ 10 kids
  - 2 teacher per class
  - 2 teachers to 30 children
  - Max 16 children in a class. Age 1-2 (1 teacher and 3 assistants) Age 2-3 (1 Teacher and 2 assistants) Age 3-4 and Grade 00 (1 teacher and 1 assistant)
  - 1 to 6
  - 1 teacher 4 children
  - This differs according to age 1 to 5 children in 1-2 years etc
  - Every teacher takes care of her own learners while outside
  - 1 teacher to 15 children, and 1 assistant
  - 1 teacher to 8 children
- other\_a6\_v2: If other category/ categories that your ECD centre falls into, please describe:
  - Npo none funded
  - Not yet funded by any,we only receiving food from The lunchbox fund
  - two grade r teachers are partially subsidized and the rest of the school is run on school fees
  - Department of Health only food funding
  - we do not have funding we work with the beneficiaries school fees and fund raisings
- other\_a8: If other frequency of funding for your ECD centre outdoor play space, please describe:

**Appendix Table 5. A table representing the content analysis for the qualitative data in component A regarding the “other” categories of outdoor play space funding frequency at Johannesburg ECD centres**

| <b>“Other” outdoor play space funding frequency categories</b>                                                               | <b>Frequency out of total 41 other descriptions</b> | <b>Percentages out of total</b> |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------------|
| We never receive funding                                                                                                     | 17                                                  | 41.5%                           |
| Completed privately only when we can afford (inconsistent frequency): Schools fees, community fundraisers, private donations | 17                                                  | 41.5%                           |
| When we apply for funding                                                                                                    | 1                                                   | 2%                              |
| Maintenance and improvements completed privately when required or when need arises                                           | 6                                                   | 15%                             |
|                                                                                                                              | 41                                                  | 100                             |

- We never received any funding so far
- I don't receive any funding I have to buy if I run short
- Quarterly
- None
- We never receive gvmnt funding. comes from fees
- we do not recieve any funding
- As needed, and as we can afford . We receive no aid.
- Not funded for outdoor equipment
- We don't receive funds for outdoor equipment
- we do not receive funding at all
- Fundraisers from school events
- Our ECD hardly gets funding the last tie it was in 2014
- Maintenance and improvements are privately funded and completed as and when required.
- Dependent on donors - although quite well equipped
- We've never received funding for the above
- Previously every year we would maintaing the playground. Cannot afford to at the moment due to the negative effects of Covid.
- as per the need. We don't do it seasonally or at specified times
- never received funding. we upgrade and make better often
- Ongoing as the need arises and funds are available
- When need be
- none
- When funds permit
- None
- we get funding only when we apply for funding

- Never, only school fees
- When there is a need we add to our wishlist and ask funders to funding/ assistance
- Never
- Dependent on funding
- never we maintain it ourselves
- Monthly
- on going if we can otherwise once in 5 to 10 years for major upgrades
- Not funded
- We are an NPO. We receive funding from Dpt of Education/DSD and from Private donors
- Combination of government funded & charity funded
- Combination: registered as NPO, government not funding at all, have to find our own private funders
- Combination (government funded, school fees and additional funding
- play\_time\_a9\_v2: How much time during the school day do children play in the outdoor play space at the ECD centre?
  - Half day +-2 hours, Full day +-4 hours
  - 1hr30min morning + between 2pm and 5pm afternoon
  - 2-3 hours morning. 3 hours afternoons
  - all day - someone is outside at some point throughout the day
  - 5 hours if a full day child - 1 and half hours if a half day child
  - Twice for a 30 minutes for the older ages. Classes under 3 may play outside more frequently for shorter periods of time. This depends on the day they are having.
  - 15 minutes- structured play 1 hour free play
  - 2-3 hours during school and all afternoon at aftercare, weather permitting.
  - Mornings +/- hour. Afternoons 2-3 years till the go home
  - 2 hours for half day learners and about 3 hours for full day learners who stay for aftercare
  - 80% of the time. the outdoor classroom is our favourite classroom
  - approximately 2 hours and at Aftercare
  - +- 5 hours per day (if 07:00 - 17:30)
  - Approx 1 hour and then we have an aftercare where they also spend time outdoors.
  - +/-35 minutes per day (Wednesday is sports day where leave centre at 10:00-10:30 at the park
  - 2 1/2 hours between 7:30 am & 12:30 pm
  - 3 to 4 hours in the morning and 3 to 4 hours in the afternoon
  - 1 hour in the morning, 3 hours in the afternoon
  - on average about 3 hours per half day even if indoor activities or arts & crafts are done outside
- describe\_covid\_rest: If the outdoor play space/s at the ECD centre were changed or restricted in any way during the 2020 and 2021 South African COVID-19 regulations, please describe:

**Appendix Table 6. A table representing the content analysis for the qualitative data in component A regarding the COVID-19 outdoor play space restrictions in South Africa in 2020 and 2021**

| Outdoor play space COVID-19 restrictions                                                     | Colour Code | Frequency out of total 54 | Percentage out of total 54 descriptions |
|----------------------------------------------------------------------------------------------|-------------|---------------------------|-----------------------------------------|
| Certain areas like the sandpit closed and certain toys removed                               | Yellow      | 14                        | 26%                                     |
| Separated classes, more smaller class time rotation, limited time outside, social distancing | Light blue  | 21                        | 39%                                     |
| Sanitising outdoor equipment and sanitising stations                                         | Purple      | 7                         | 13%                                     |
| No outdoor equipment or jungle gyms in play areas allowed to be used                         | Green       | 12                        | 22%                                     |
|                                                                                              |             | 54                        | 100                                     |

- Sandpit not allowed, classes had to rotate (couldn't be out together) and equipment cleaned between classes
- Learner's were not allowed to play on them
- We put a Ret tape and others were shifted
- All toys were removed. the children were left with just the wooden jungle gyms.
- Sanitizing stations installed outdoors and certainly play areas were made off limits for daily use.
- Sandpits were closed
- Jungle gym and sandpit closed
- We were shut down for 6 months and thereafter could not use any equipment that needed washing, or sand pits
- Certain grades in certain areas - rotated daily so that children get to play on different equipment.
- The children did not go out during covid 19. We also installed two more tapes outside with basins for washing hands
- We took our swing and slide out
- we were not allowed to open the play areas as per the SOP (standard operating procedures) by DSD
- Children were very few during covid 19 so we were not allowed to take them outside
- no jungle jyms allowed, no sandpit play, no sharing of toys
- Classes and ages were separated by age group
- No sandpit, no sensory play equipment, one class per play area at a time.
- We had to remove jungle jym
- We did not use the sandpit. We sprayed down the plastic and metal equipment with bleach before and after every playtime.
- We could not use the sandpit, messy or water play
- Only a limited number of children could play at a time

- Children played in shifts to avoid too many on the playground at one time
- No playing on jungle gym as we needed the kids to play separately from each other due to no contact during Covid
- we had children from each class playing at different times to manage numbers at a given time on the playground. Whereas under normal circumstances we atleast have 2 classes playing on the same play area at the same time.
- constant sanitizing, less outside time in order to avoid overlap of groups.
- certain resources and equipment wasn't utilised eg sandpit
- Divided to separate the 3, 4 and 5 year olds
- communal sand and water play was not available
- Children were limited to play areas so age bands were not mixed
- no outdoor activities and sandpit play
- Sandpit closed
- Children wore masks and certain play areas were out of bounds to accommodate social distancing.
- Numbrs of children were reduced and social distancing enforced. Play times were staggered to ensure that no more than 8 were in the areas at any time
- The school was closed for a few months. When we opened the play areas were sanitised before and after use. All classes used the play areas at different times, so not to mix the classes in case anyone was infected with Covid.
- Children's outdoor play time was based on a time rotation, so not all the kids were outside together
- sanitising everyday
- Children weren't coming to school. Outdoor play space recently changed due to flooding in township streets.
- Limited access
- Separate age groups played outside during different times
- We tried to keep classes separate but it was difficult.
- different jungle gyms for different groups
- We had different means of segregation and sanitation during that period
- the sandpit was not used & children played one at a time on certain equipment and it was santised after every use

## Appendix N: Results and Data Analysis – Summary of Component B (Descriptive and Inferential Statistics)

**Appendix Table 7. A table outlining a summary of the results and data analysis of component B using both descriptive and inferential statistics**

| Characteristics    | Category    | Total | Low ECD (freq) | Low ECD (%) | High ECD (freq) | High ECD (%) | Pearson's Chi-Square Test of Independence                                                                                                                                                                                                                                                                                                                                                                    |             | Cramer's V (Measure of association)                                                                                                                                                                                                                                                                                                                                 |    |
|--------------------|-------------|-------|----------------|-------------|-----------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|                    |             |       |                |             |                 |              | Inferential non-parametric hypothesis testing that measures whether two categorical variables are related to each other.<br><b>H0: Socioeconomic status of ECD centre and XXX are independent.</b><br><b>H1: Socioeconomic status of ECD centre and XXX are NOT independent</b><br>Expected values: (row sum * col sum) / total sum<br>$(obs - exp)^2 / exp$<br><b>Reject H0 if <math>p &lt; 0.05</math></b> |             | Cramer's V = $\sqrt{(X^2/n) / \min(c-1, r-1)}$ where $X^2$ is the chi-squared test stat<br>Cramer's V is a measure of the strength of association between two nominal variables.<br>It ranges from 0 to 1 where:<br>0 indicates no association between the two variables.<br>1 indicates a strong association between the two variables.<br>dof: degrees of freedom |    |
| Type of playground | Traditional | 28    | 12             | 43%         | 16              | 30%          | Chi squared test stat                                                                                                                                                                                                                                                                                                                                                                                        | 25,52825945 | sample size (n)                                                                                                                                                                                                                                                                                                                                                     | 82 |

|                                    |                                 |    |    |      |    |      |                                                                                |             |                                                                                 |                    |
|------------------------------------|---------------------------------|----|----|------|----|------|--------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------|--------------------|
|                                    | Natural                         | 3  | 2  | 7%   | 1  | 2%   | Degrees of freedom                                                             | 10          | c-1                                                                             | 1                  |
|                                    | Creative                        | 22 | 4  | 14%  | 18 | 33%  | p value                                                                        | 0,004429232 | r-1                                                                             | 10                 |
|                                    | Concrete/ sand                  | 1  | 1  | 4%   | 0  | 0%   | Result                                                                         | REJECT H0   | dof: min(c-1,r-1)                                                               | 1                  |
|                                    | No outdoor play space           | 2  | 2  | 7%   | 0  | 0%   | Type of playground and socioeconomic status of ECD centre are not independent. |             | Cramer's V                                                                      | 0,557961           |
|                                    | Other                           | 3  | 0  | 0%   | 3  | 6%   |                                                                                |             | correlation                                                                     | strong correlation |
|                                    | Traditional & Creative          | 6  | 0  | 0%   | 6  | 11%  |                                                                                |             | Type of playground and socioeconomic status of ECDs display strong correlation. |                    |
|                                    | Traditional & Natural           | 2  | 0  | 0%   | 2  | 4%   |                                                                                |             |                                                                                 |                    |
|                                    | Traditional, Natural & Creative | 4  | 1  | 4%   | 3  | 6%   |                                                                                |             |                                                                                 |                    |
|                                    | Natural & Creative              | 2  | 1  | 4%   | 1  | 2%   |                                                                                |             |                                                                                 |                    |
|                                    | None chosen                     | 9  | 5  | 18%  | 4  | 7%   |                                                                                |             |                                                                                 |                    |
|                                    |                                 |    | 28 | 100% | 54 | 100% |                                                                                |             |                                                                                 |                    |
| Type of fixed structural materials | Wood                            | 25 | 2  | 7%   | 23 | 43%  | Chi squared test stat                                                          | 35,09373441 | sample size (n)                                                                 | 82                 |
|                                    | Plastic                         | 1  | 0  | 0%   | 1  | 2%   | Degrees of freedom                                                             | 12          | c-1                                                                             | 1                  |
|                                    | Steel                           | 11 | 9  | 32%  | 2  | 4%   | p value                                                                        | 0,000452479 | r-1                                                                             | 12                 |
|                                    | Aluminium                       | 0  | 0  | 0%   | 0  | 0%   | Result                                                                         | REJECT H0   | dof: min(c-1,r-1)                                                               | 1                  |
|                                    | No fixed structures             | 5  | 4  | 14%  | 1  | 2%   | Type of fixed structural materials and socioeconomic status of                 |             | Cramer's V                                                                      | 0,654196           |
|                                    | None chosen                     | 3  | 1  | 4%   | 2  | 4%   |                                                                                |             | correlation                                                                     |                    |

|                              |                             |    |    |      |    |      |                                                                                          |                                                                         |                                                                                                  |                    |
|------------------------------|-----------------------------|----|----|------|----|------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------|
|                              | Wood, Plastic & Steel       | 10 | 5  | 18%  | 5  | 9%   | ECD centre are not independent.                                                          |                                                                         | Type of fixed structural materials and socio economic status of ECDs display strong correlation. | strong correlation |
|                              | Plastic & Steel             | 3  | 1  | 4%   | 2  | 4%   |                                                                                          |                                                                         |                                                                                                  |                    |
|                              | Wood & Steel                | 15 | 5  | 18%  | 10 | 19%  |                                                                                          |                                                                         |                                                                                                  |                    |
|                              | Wood & Aluminium            | 4  | 1  | 4%   | 3  | 6%   |                                                                                          |                                                                         |                                                                                                  |                    |
|                              | Steel & No fixed structures | 1  | 0  | 0%   | 1  | 2%   |                                                                                          |                                                                         |                                                                                                  |                    |
|                              | Wood & Plastic              | 2  | 0  | 0%   | 2  | 4%   |                                                                                          |                                                                         |                                                                                                  |                    |
|                              | Plastic, Steel & Aluminium  | 2  | 0  | 0%   | 2  | 4%   |                                                                                          |                                                                         |                                                                                                  |                    |
|                              |                             |    | 28 | 100% | 54 | 100% |                                                                                          |                                                                         |                                                                                                  |                    |
| Type of playground equipment | linear swing (1)            | 65 | 18 | 14%  | 47 | 11%  | Chi squared test stat                                                                    | 214,2991895                                                             | sample size (n)                                                                                  | 543                |
|                              | rotational swings (2)       | 21 | 3  | 2%   | 18 | 4%   | Degrees of freedom                                                                       | 14                                                                      | c-1                                                                                              | 1                  |
|                              | loose tyres (3)             | 42 | 13 | 10%  | 29 | 7%   | p value                                                                                  | 0,0000000000<br>00000000000<br>00000000000<br>00000064999<br>4826455306 | r-1                                                                                              | 14                 |
|                              | fixed tyres (4)             | 40 | 10 | 8%   | 30 | 7%   | Result                                                                                   | REJECT H0                                                               | dof: min(c-1,r-1)                                                                                | 1                  |
|                              | merry-go-round (5)          | 11 | 7  | 6%   | 4  | 1%   | Type of playground equipment and socioeconomic status of ECD centre are not independent. |                                                                         | Cramer's V                                                                                       | 0,628218           |
|                              | seesaw (6)                  | 22 | 9  | 7%   | 13 | 3%   |                                                                                          |                                                                         | correlation                                                                                      | strong corr        |
|                              |                             |    |    |      |    |      |                                                                                          |                                                                         |                                                                                                  |                    |

|                               |                                        |    |     |      |     |      |                                                                                           |             |                                                                                                                                                                                    |         |
|-------------------------------|----------------------------------------|----|-----|------|-----|------|-------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|                               |                                        |    |     |      |     |      |                                                                                           |             |                                                                                                                                                                                    | elation |
|                               | monkey bars (7)                        | 49 | 9   | 7%   | 40  | 10%  |                                                                                           |             | Type of playground equipment and socioeconomic status of ECDs display strong correlation.                                                                                          |         |
|                               | climbing jungle gym (8)                | 64 | 15  | 12%  | 49  | 12%  |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | fireman pole (9)                       | 43 | 5   | 4%   | 38  | 9%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | slide (10)                             | 64 | 15  | 12%  | 49  | 12%  |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | tunnel (11)                            | 45 | 8   | 6%   | 37  | 9%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | trampoline (12)                        | 29 | 7   | 6%   | 22  | 5%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | bridge (13)                            | 38 | 2   | 2%   | 36  | 9%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | none (14)                              | 5  | 4   | 3%   | 1   | 0%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | other (15)                             | 5  | 0   | 0%   | 5   | 1%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               |                                        |    | 125 | 100% | 418 | 100% |                                                                                           |             |                                                                                                                                                                                    |         |
| Count of Playground equipment | None chosen                            | 4  | 2   | 7%   | 2   | 4%   | Chi squared test stat                                                                     | 37,29297709 | no Cramer's V for count<br>only for nominal categorical variables count is ordinal<br><br>categorical = categories<br>nominal = names;<br>can't order them e.g. type of playground |         |
|                               | No. schools with 0 pieces of equipment | 5  | 4   | 14%  | 1   | 2%   | Degrees of freedom                                                                        | 14          |                                                                                                                                                                                    |         |
|                               | No. schools with 1 piece of equipment  | 2  | 2   | 7%   | 0   | 0%   | p value                                                                                   | 0,000666014 |                                                                                                                                                                                    |         |
|                               | No. schools with 2 pieces of equipment | 3  | 2   | 7%   | 1   | 2%   | Result                                                                                    | REJECT H0   |                                                                                                                                                                                    |         |
|                               | No. schools with 3 pieces of equipment | 5  | 3   | 11%  | 2   | 4%   | Count of Playground equipment and socioeconomic status of ECD centre are not independent. |             |                                                                                                                                                                                    |         |
|                               | No. schools with 4 pieces of equipment | 1  | 0   | 0%   | 1   | 2%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | No. schools with 5 pieces of equipment | 5  | 2   | 7%   | 3   | 6%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | No. schools with 6 pieces of equipment | 10 | 5   | 18%  | 5   | 9%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | No. schools with 7 pieces of equipment | 8  | 3   | 11%  | 5   | 9%   |                                                                                           |             |                                                                                                                                                                                    |         |
|                               | No. schools with 8 pieces of equipment | 11 | 2   | 7%   | 9   | 17%  |                                                                                           |             |                                                                                                                                                                                    |         |

|                                  |                                         |    |    |      |    |      |                                                                                       |                          |                                                                                        |                    |
|----------------------------------|-----------------------------------------|----|----|------|----|------|---------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------|--------------------|
|                                  | No. schools with 9 pieces of equipment  | 11 | 2  | 7%   | 9  | 17%  |                                                                                       |                          |                                                                                        |                    |
|                                  | No. schools with 10 pieces of equipment | 8  | 1  | 4%   | 7  | 13%  |                                                                                       |                          |                                                                                        |                    |
|                                  | No. schools with 11 pieces of equipment | 7  | 0  | 0%   | 7  | 13%  |                                                                                       |                          |                                                                                        |                    |
|                                  | No. schools with 12 pieces of equipment | 1  | 0  | 0%   | 1  | 2%   |                                                                                       |                          |                                                                                        |                    |
|                                  | No. schools with 13 pieces of equipment | 1  | 0  | 0%   | 1  | 2%   |                                                                                       |                          |                                                                                        |                    |
|                                  |                                         |    | 28 | 100% | 54 | 100% |                                                                                       |                          |                                                                                        |                    |
| <b>Type of natural resources</b> | Trees (1)                               |    | 12 | 18%  |    |      | <b>Chi squared test stat</b>                                                          | 101,7141869              | <b>sample size (n)</b>                                                                 | 326                |
|                                  |                                         | 58 |    |      | 46 | 0    |                                                                                       |                          |                                                                                        |                    |
|                                  | Plants (2)                              |    | 9  | 13%  |    |      | <b>Degrees of freedom</b>                                                             | 9                        | <b>c-1</b>                                                                             | 1                  |
|                                  |                                         | 54 |    |      | 45 | 17%  |                                                                                       |                          |                                                                                        |                    |
|                                  | Vegetable or herb gardens (3)           |    | 10 | 15%  |    |      | <b>p value</b>                                                                        | 0,0000000000000000070786 | <b>r-1</b>                                                                             | 9                  |
|                                  |                                         | 36 |    |      | 26 | 10%  |                                                                                       |                          |                                                                                        |                    |
|                                  | Flower gardens (4)                      |    | 7  | 10%  |    |      | <b>Result</b>                                                                         | REJECT H0                | <b>dof: min(c-1,r-1)</b>                                                               | 1                  |
|                                  |                                         | 44 |    |      | 37 | 14%  |                                                                                       |                          |                                                                                        |                    |
|                                  | Tree stumps or logs (5)                 |    | 1  | 1%   |    |      | Type of natural resources and socioeconomic status of ECD centre are not independent. |                          | <b>Cramer's V</b>                                                                      | 0,558576           |
|                                  |                                         | 32 |    |      | 31 | 12%  |                                                                                       |                          | <b>correlation</b>                                                                     | strong correlation |
|                                  | Rocky area (6)                          |    | 7  | 10%  |    |      |                                                                                       |                          | Type of natural resources and socioeconomic status of ECDs display strong correlation. |                    |
|                                  |                                         | 29 |    |      | 22 | 9%   |                                                                                       |                          |                                                                                        |                    |
|                                  | Sandy area (7)                          | 55 | 12 | 18%  | 43 | 17%  |                                                                                       |                          |                                                                                        |                    |
|                                  | Natural/ seminatural water features (8) | 4  | 0  | 0%   | 4  | 2%   |                                                                                       |                          |                                                                                        |                    |
|                                  | No natural aspects (9)                  | 11 | 8  | 12%  | 3  | 1%   |                                                                                       |                          |                                                                                        |                    |
|                                  | Other (10)                              | 3  | 2  | 3%   | 1  | 0%   |                                                                                       |                          |                                                                                        |                    |

|                                   |                                      |                  |    |       |     |       |                                                                                        |                                 |                   |   |
|-----------------------------------|--------------------------------------|------------------|----|-------|-----|-------|----------------------------------------------------------------------------------------|---------------------------------|-------------------|---|
|                                   |                                      |                  | 68 | 100 % | 54  | 100 % |                                                                                        |                                 |                   |   |
| Count of natural resources        | None chosen                          | 3                | 1  | 4%    | 2   | 4%    | Chi squared test stat:                                                                 | 34,35130886                     | no Cramer's V     |   |
|                                   | No. schools with 0 natural resources | 11               | 8  | 29%   | 3   | 6%    | Degrees of freedom                                                                     | 9                               |                   |   |
|                                   | No. schools with 1 natural resource  | 6                | 5  | 18%   | 1   | 2%    | p value                                                                                | 0,000077502<br>2617854426       |                   |   |
|                                   | No. schools with 2 natural resources | 3                | 1  | 4%    | 2   | 4%    | Result                                                                                 | REJECT H0                       |                   |   |
|                                   | No. schools with 3 natural resources | 9                | 4  | 14%   | 5   | 9%    | Count of natural resources and socioeconomic status of ECD centre are not independent. |                                 |                   |   |
|                                   | No. schools with 4 natural resources | 16               | 5  | 18%   | 11  | 20%   |                                                                                        |                                 |                   |   |
|                                   | No. schools with 5 natural resources | 10               | 3  | 11%   | 7   | 13%   |                                                                                        |                                 |                   |   |
|                                   | No. schools with 6 natural resources | 11               | 0  | 0%    | 11  | 20%   |                                                                                        |                                 |                   |   |
|                                   | No. schools with 7 natural resources | 11               | 1  | 4%    | 10  | 19%   |                                                                                        |                                 |                   |   |
|                                   | No. schools with 8 natural resources | 2                | 0  | 0%    | 2   | 4%    |                                                                                        |                                 |                   |   |
|                                   |                                      |                  | 28 | 100 % | 54  | 100 % |                                                                                        |                                 |                   |   |
|                                   | Type of tactile exploration spaces   | Sandpit area (1) | 63 | 16    | 35% | 47    | 30%                                                                                    | Chi squared test stat           |                   |   |
| muddy area/mud kitchen (2)        |                                      | 37               | 4  | 9%    | 33  | 21%   | Degrees of freedom                                                                     | 5                               | c-1               | 1 |
| water station (3)                 |                                      | 50               | 13 | 28%   | 37  | 23%   | p value                                                                                | 0,000000078<br>16008528819<br>5 | r-1               | 5 |
| messy play/ touch exploration (4) |                                      | 44               | 6  | 13%   | 38  | 24%   | Result                                                                                 | REJECT H0                       | dof: min(c-1,r-1) | 1 |

|                                            |                                               |    |    |          |     |          |                                                                                                 |                           |                                                                                                    |                                 |
|--------------------------------------------|-----------------------------------------------|----|----|----------|-----|----------|-------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------|---------------------------------|
|                                            | None (5)                                      | 9  | 7  | 15%      | 2   | 1%       | Type of tactile exploration spaces and socioeconomic status of ECD centre are not independent.  |                           | <b>Cramer's V</b>                                                                                  | 0,45<br>045                     |
|                                            | Other (6)                                     | 1  | 0  | 0%       | 1   | 1%       |                                                                                                 |                           | <b>correlation</b>                                                                                 | mod<br>erate<br>corre<br>lation |
|                                            |                                               |    | 46 | 100<br>% | 158 | 100<br>% |                                                                                                 |                           | Type of tactile exploration spaces and socio economic status of ECDs display moderate correlation. |                                 |
| <b>Count of Tactile exploration spaces</b> | None chosen                                   | 4  | 1  | 4%       | 3   | 6%       | <b>Chi squared test stat</b>                                                                    | 28,23517606               | no cramer's V                                                                                      |                                 |
|                                            | No. schools with 0 tactile exploration spaces | 9  | 7  | 25%      | 2   | 4%       | <b>Degrees of freedom</b>                                                                       | 6                         |                                                                                                    |                                 |
|                                            | No. schools with 1 tactile exploration space  | 13 | 8  | 29%      | 5   | 9%       | <b>p value</b>                                                                                  | 0,000084847<br>7985639548 |                                                                                                    |                                 |
|                                            | No. schools with 2 tactile exploration spaces | 13 | 7  | 25%      | 6   | 11%      | <b>Result</b>                                                                                   | REJECT H0                 |                                                                                                    |                                 |
|                                            | No. schools with 3 tactile exploration spaces | 14 | 2  | 7%       | 12  | 22%      | Count of Tactile exploration spaces and socioeconomic status of ECD centre are not independent. |                           |                                                                                                    |                                 |
|                                            | No. schools with 4 tactile exploration space  | 28 | 3  | 11%      | 25  | 46%      |                                                                                                 |                           |                                                                                                    |                                 |
|                                            | No. schools with 5 tactile exploration spaces | 1  | 0  | 0%       | 1   | 2%       |                                                                                                 |                           |                                                                                                    |                                 |
|                                            |                                               |    | 28 | 100<br>% | 54  | 100<br>% |                                                                                                 |                           |                                                                                                    |                                 |
| <b>Type of Manufacture</b>                 | Buckets & spades (1)                          | 61 | 16 | 26%      | 45  | 20%      | <b>Chi squared test stat</b>                                                                    | 87,08140531               | <b>sample size (n)</b>                                                                             | 287                             |

|                                                 |                                                                |             |    |       |     |       |                                                                                                   |                                         |                                                                                                    |                       |
|-------------------------------------------------|----------------------------------------------------------------|-------------|----|-------|-----|-------|---------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------|
| d loose materials                               | Pots & pans (2)                                                | 44          | 5  | 8%    | 39  | 17%   | Degrees of freedom                                                                                | 8                                       | c-1                                                                                                | 1                     |
|                                                 | Plastic piping (3)                                             | 22          | 3  | 5%    | 19  | 8%    | p value                                                                                           | 0,000000000<br>00000181676<br>642826829 | r-1                                                                                                | 8                     |
|                                                 | String/ fabric/ netting (4)                                    | 25          | 3  | 5%    | 22  | 10%   | Result                                                                                            | REJECT H0                               | dof: min(c-1,r-1)                                                                                  | 1                     |
|                                                 | Recycled materials (5)                                         | 39          | 4  | 7%    | 35  | 15%   | Type of Manufactured loose materials and socioeconomic status of ECD centre are not independent.  |                                         | Cramer's V                                                                                         | 0,55<br>083           |
|                                                 | Tyres (6)                                                      | 48          | 15 | 25%   | 33  | 15%   |                                                                                                   |                                         |                                                                                                    |                       |
|                                                 | Soft playground equipment (e.g. blocks, halfmoons, wedges) (7) | 37          | 7  | 11%   | 30  | 13%   |                                                                                                   |                                         | Type of Manufactured loose materials and socio economic status of ECDs display strong correlation. |                       |
|                                                 | None of the above (8)                                          | 9           | 7  | 11%   | 2   | 1%    |                                                                                                   |                                         |                                                                                                    |                       |
|                                                 | Other (9)                                                      | 2           | 1  | 2%    | 1   | 0%    |                                                                                                   |                                         |                                                                                                    |                       |
|                                                 |                                                                |             | 61 | 100 % | 226 | 100 % |                                                                                                   |                                         |                                                                                                    |                       |
|                                                 | Count of Manufacture d loose materials                         | None chosen | 3  | 1     | 4%  | 2     |                                                                                                   |                                         | 4%                                                                                                 | Chi squared test stat |
| No. schools with 0 manufactured loose materials |                                                                | 2           | 7  | 25%   | 2   | 4%    | Degrees of freedom                                                                                | 8                                       |                                                                                                    |                       |
| No. schools with 1 manufactured loose material  |                                                                | 17          | 6  | 21%   | 5   | 9%    | p value                                                                                           | 0,000273988                             |                                                                                                    |                       |
| No. schools with 2 manufactured loose materials |                                                                | 14          | 6  | 21%   | 7   | 13%   | Result                                                                                            | REJECT H0                               |                                                                                                    |                       |
| No. schools with 3 manufactured loose materials |                                                                | 5           | 2  | 7%    | 3   | 6%    | Count of Manufactured loose materials and socioeconomic status of ECD centre are not independent. |                                         |                                                                                                    |                       |
| No. schools with 4 manufactured loose materials |                                                                | 15          | 3  | 11%   | 12  | 22%   |                                                                                                   |                                         |                                                                                                    |                       |
| No. schools with 5 manufactured loose materials |                                                                | 8           | 2  | 7%    | 6   | 11%   |                                                                                                   |                                         |                                                                                                    |                       |

|                                         |                                                 |    |    |      |     |      |                                                                                             |                                         |                                                                                              |                    |
|-----------------------------------------|-------------------------------------------------|----|----|------|-----|------|---------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------|--------------------|
|                                         | No. schools with 6 manufactured loose materials | 18 | 1  | 4%   | 17  | 31%  |                                                                                             |                                         |                                                                                              |                    |
|                                         | No. schools with 7 manufactured loose materials | 0  | 0  | 0%   | 0   | 0%   |                                                                                             |                                         |                                                                                              |                    |
|                                         |                                                 |    | 28 | 100% | 54  | 100% |                                                                                             |                                         |                                                                                              |                    |
| <b>Type of Natural loose materials</b>  | Sand (1)                                        | 63 | 17 | 0    | 46  | 20%  | <b>Chi squared test stat</b>                                                                | 80,86388588                             | <b>sample size (n)</b>                                                                       | 290                |
|                                         | Water (2)                                       | 59 | 17 | 26%  | 42  | 19%  | <b>Degrees of freedom</b>                                                                   | 8                                       | <b>c-1</b>                                                                                   | 1                  |
|                                         | Twigs/ Branches (3)                             | 47 | 10 | 15%  | 37  | 16%  | <b>p value</b>                                                                              | 0,0000000000<br>00003275332<br>95209791 | <b>r-1</b>                                                                                   | 8                  |
|                                         | Logs (4)                                        | 27 | 6  | 9%   | 21  | 9%   | <b>Result</b>                                                                               | REJECT H0                               | <b>dof: min(c-1,r-1)</b>                                                                     | 1                  |
|                                         | Pebbles/ Stones (5)                             | 38 | 4  | 6%   | 34  | 15%  | Type of Natural loose materials and socioeconomic status of ECD centre are not independent. |                                         | <b>Cramer's V</b>                                                                            | 0,52<br>8054       |
|                                         | Shells (6)                                      | 20 | 2  | 3%   | 18  | 8%   |                                                                                             |                                         | <b>correlation</b>                                                                           | strong correlation |
|                                         | Pine cones (7)                                  | 26 | 3  | 5%   | 23  | 10%  |                                                                                             |                                         | Type of Natural loose materials and socioeconomic status of ECDs display strong correlation. |                    |
|                                         | None of the above (8)                           | 9  | 6  | 9%   | 3   | 1%   |                                                                                             |                                         |                                                                                              |                    |
|                                         | Other (9)                                       | 1  | 0  | 0%   | 1   | 0%   |                                                                                             |                                         |                                                                                              |                    |
|                                         |                                                 |    | 65 | 100% | 225 | 100% |                                                                                             |                                         |                                                                                              |                    |
| <b>Count of Natural loose equipment</b> | None chosen                                     | 4  | 1  | 4%   | 3   | 6%   | <b>Chi squared test stat</b>                                                                | 35,84666509                             | no Cramer's V                                                                                |                    |
|                                         | No. schools with 0 natural loose materials      | 9  | 6  | 21%  | 3   | 6%   | <b>Degrees of freedom</b>                                                                   | 8                                       |                                                                                              |                    |

|                                                    |                                            |    |    |       |    |       |                                                                                                |                                                 |                          |                       |
|----------------------------------------------------|--------------------------------------------|----|----|-------|----|-------|------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------|-----------------------|
|                                                    | No. schools with 1 natural loose materials | 3  | 3  | 11%   | 0  | 0%    | <b>p value</b>                                                                                 | 0,000018732<br>1459109481                       |                          |                       |
|                                                    | No. schools with 2 natural loose materials | 12 | 5  | 18%   | 7  | 13%   | <b>Result</b>                                                                                  | REJECT H0                                       |                          |                       |
|                                                    | No. schools with 3 natural loose materials | 14 | 9  | 32%   | 5  | 9%    | Count of Natural loose equipment and socioeconomic status of ECD centre are not independent.   |                                                 |                          |                       |
|                                                    | No. schools with 4 natural loose materials | 14 | 3  | 11%   | 11 | 20%   |                                                                                                |                                                 |                          |                       |
|                                                    | No. schools with 5 natural loose materials | 10 | 0  | 0%    | 10 | 19%   |                                                                                                |                                                 |                          |                       |
|                                                    | No. schools with 6 natural loose materials | 6  | 0  | 0%    | 6  | 11%   |                                                                                                |                                                 |                          |                       |
|                                                    | No. schools with 7 natural loose materials | 10 | 1  | 4%    | 9  | 17%   |                                                                                                |                                                 |                          |                       |
|                                                    |                                            |    | 28 | 100 % | 54 | 100 % |                                                                                                |                                                 |                          |                       |
| <b>Type of Manufacture<br/>d movement<br/>toys</b> | Balls (1)                                  | 71 | 24 | 26%   | 47 | 18%   | <b>Chi squared test stat</b>                                                                   | 109,9252728                                     | <b>sample size (n)</b>   | 356                   |
|                                                    | Scooter/ pushbike/ tricycle (2)            | 62 | 16 | 18%   | 46 | 17%   | <b>Degrees of freedom</b>                                                                      | 10                                              | <b>c-1</b>               | 1                     |
|                                                    | Skipping rope (3)                          | 44 | 15 | 16%   | 29 | 11%   | <b>p value</b>                                                                                 | 0,000000000<br>00000000055<br>24120512560<br>71 | <b>r-1</b>               | 10                    |
|                                                    | Bats/ rackets (4)                          | 36 | 8  | 9%    | 28 | 11%   | <b>Result</b>                                                                                  | REJECT H0                                       | <b>dof: min(c-1,r-1)</b> | 1                     |
|                                                    | Swing ball (5)                             | 13 | 4  | 4%    | 9  | 3%    | Type of Manufactured movement toys and socioeconomic status of ECD centre are not independent. |                                                 | <b>Cramer's V</b>        | 0,55<br>5679          |
|                                                    | Wheelbarrow (6)                            | 26 | 4  | 4%    | 22 | 8%    |                                                                                                |                                                 | <b>correlation</b>       | strong<br>correlation |
|                                                    | Ladder (7)                                 | 44 | 6  | 7%    | 38 | 14%   |                                                                                                |                                                 |                          |                       |
|                                                    | Bucket stilts (8)                          | 33 | 6  | 7%    | 27 | 10%   |                                                                                                |                                                 |                          |                       |
|                                                    | Hoppy ball (9)                             | 18 | 2  | 2%    | 16 | 6%    |                                                                                                |                                                 |                          |                       |
|                                                    |                                            |    |    |       |    |       |                                                                                                |                                                 |                          |                       |

|                                      |                                               |                |    |       |     |       |                                                                                                 |                       |                                                                                                  |  |
|--------------------------------------|-----------------------------------------------|----------------|----|-------|-----|-------|-------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------|--|
|                                      | None of the above (10)                        | 4              | 2  | 2%    | 2   | 1%    |                                                                                                 |                       | Type of Manufactured movement toys and socio economic status of ECDs display strong correlation. |  |
|                                      | Other (11)                                    | 5              | 4  | 4%    | 1   | 0%    |                                                                                                 |                       |                                                                                                  |  |
|                                      |                                               |                | 91 | 100 % | 265 | 100 % |                                                                                                 |                       |                                                                                                  |  |
| Count of Manufacture d movement toys | None chosen                                   | 3              | 1  | 4%    | 2   | 4%    | Chi squared test stat                                                                           | 34,18983172           | no Cramer's V                                                                                    |  |
|                                      | No. schools with 0 manufactured movement toys | 4              | 2  | 7%    | 2   | 4%    | Degrees of freedom                                                                              | 10                    |                                                                                                  |  |
|                                      | No. schools with 1 manufactured movement toys | 4              | 3  | 11%   | 1   | 2%    | p value                                                                                         | 0,000171508           |                                                                                                  |  |
|                                      | No. schools with 2 manufactured movement toys | 6              | 4  | 14%   | 2   | 4%    | Result                                                                                          | REJECT H0             |                                                                                                  |  |
|                                      | No. schools with 3 manufactured movement toys | 12             | 8  | 29%   | 4   | 7%    | Count of Manufactured movement toys and socioeconomic status of ECD centre are not independent. |                       |                                                                                                  |  |
|                                      | No. schools with 4 manufactured movement toys | 11             | 0  | 0%    | 11  | 20%   |                                                                                                 |                       |                                                                                                  |  |
|                                      | No. schools with 5 manufactured movement toys | 14             | 4  | 14%   | 10  | 19%   |                                                                                                 |                       |                                                                                                  |  |
|                                      | No. schools with 6 manufactured movement toys | 13             | 4  | 14%   | 9   | 17%   |                                                                                                 |                       |                                                                                                  |  |
|                                      | No. schools with 7 manufactured movement toys | 6              | 1  | 4%    | 5   | 9%    |                                                                                                 |                       |                                                                                                  |  |
|                                      | No. schools with 8 manufactured movement toys | 4              | 0  | 0%    | 4   | 7%    |                                                                                                 |                       |                                                                                                  |  |
|                                      | No. schools with 9 manufactured movement toys | 5              | 1  | 4%    | 4   | 7%    |                                                                                                 |                       |                                                                                                  |  |
|                                      |                                               |                | 28 | 100 % | 54  | 100 % |                                                                                                 |                       |                                                                                                  |  |
|                                      | Type of Quiet spaces                          | Tree house (1) | 25 | 2     | 5%  | 23    | 19%                                                                                             | Chi squared test stat |                                                                                                  |  |

|                       |                                 |    |    |       |     |       |                                                                                   |                                   |                                                                                    |                    |
|-----------------------|---------------------------------|----|----|-------|-----|-------|-----------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------|--------------------|
|                       | Wendy house (2)                 | 27 | 7  | 19%   | 20  | 17%   | Degrees of freedom                                                                | 7                                 | c-1                                                                                | 1                  |
|                       | Tunnel (3)                      | 35 | 3  | 8%    | 32  | 27%   | p value                                                                           | 0,000000009<br>34222139885<br>618 | r-1                                                                                | 7                  |
|                       | Cave (4)                        | 5  | 1  | 3%    | 4   | 3%    | Result                                                                            | REJECT H0                         | dof: min(c-1,r-1)                                                                  | 1                  |
|                       | Quiet corner (5)                | 29 | 8  | 22%   | 21  | 18%   | Type of Quiet spaces and socioeconomic status of ECD centre are not independent.  |                                   | Cramer's V                                                                         | 0,57<br>1565       |
|                       | Tent (6)                        | 14 | 2  | 5%    | 12  | 10%   |                                                                                   |                                   | Correlation                                                                        | strong correlation |
|                       | None of the above (7)           | 18 | 12 | 32%   | 6   | 5%    |                                                                                   |                                   | Type of Quiet spaces and socio economic status of ECDs display strong correlation. |                    |
|                       | Other (8)                       | 3  | 2  | 5%    | 1   | 1%    |                                                                                   |                                   |                                                                                    |                    |
|                       |                                 |    | 37 | 100 % | 119 | 100 % |                                                                                   |                                   |                                                                                    |                    |
| Count of Quiet spaces | None chosen                     | 4  | 1  | 4%    | 3   | 6%    | Chi squared test stat                                                             | 30,78990642                       | no Cramer's V                                                                      |                    |
|                       | No. schools with 0 quiet spaces | 18 | 12 | 43%   | 6   | 11%   | Degrees of freedom                                                                | 7                                 |                                                                                    |                    |
|                       | No. schools with 1 quiet space  | 23 | 12 | 43%   | 11  | 20%   | p value                                                                           | 0,000067972<br>6478133552         |                                                                                    |                    |
|                       | No. schools with 2 quiet spaces | 12 | 1  | 4%    | 11  | 20%   | Result                                                                            | REJECT H0                         |                                                                                    |                    |
|                       | No. schools with 3 quiet spaces | 15 | 0  | 0%    | 15  | 28%   | Count of Quiet spaces and socioeconomic status of ECD centre are not independent. |                                   |                                                                                    |                    |
|                       | No. schools with 4 quiet spaces | 7  | 1  | 4%    | 6   | 11%   |                                                                                   |                                   |                                                                                    |                    |
|                       | No. schools with 5 quiet spaces | 1  | 0  | 0%    | 1   | 2%    |                                                                                   |                                   |                                                                                    |                    |
|                       | No. schools with 6 quiet spaces | 2  | 1  | 4%    | 1   | 2%    |                                                                                   |                                   |                                                                                    |                    |
|                       |                                 |    | 28 | 100 % | 54  | 100 % |                                                                                   |                                   |                                                                                    |                    |

|                           |                                     |    |    |            |    |       |                                                                                       |                           |                   |                                                                                        |                    |  |
|---------------------------|-------------------------------------|----|----|------------|----|-------|---------------------------------------------------------------------------------------|---------------------------|-------------------|----------------------------------------------------------------------------------------|--------------------|--|
| Type of Adventure spaces  | Fairy garden                        | 16 | 4  | 13,3<br>3% | 12 | 14%   | Chi squared test stat                                                                 | 29,61955034               | sample size (n)   | 116                                                                                    |                    |  |
|                           | Winding paths                       | 21 | 1  | 3%         | 20 | 23%   | Degrees of freedom                                                                    | 6                         | c-1               | 1                                                                                      |                    |  |
|                           | Mazes                               | 3  | 1  | 3%         | 2  | 2%    | p value                                                                               | 0,000046424<br>9905049592 | r-1               | 6                                                                                      |                    |  |
|                           | Secret tunnels                      | 7  | 1  | 3%         | 6  | 7%    | Result                                                                                | REJECT H0                 | dof: min(c-1,r-1) | 1                                                                                      |                    |  |
|                           | Digging areas or scratch patches    | 37 | 8  | 27%        | 29 | 34%   | Type of Adventure spaces and socioeconomic status of ECD centre are not independent.  |                           |                   | Cramer's V                                                                             | 0,50<br>5313       |  |
|                           | None of the above                   | 28 | 14 | 47%        | 14 | 16%   |                                                                                       |                           |                   | Correlation                                                                            | strong correlation |  |
|                           | Other                               | 4  | 1  | 3%         | 3  | 3%    |                                                                                       |                           |                   | Type of Adventure spaces and socio economic status of ECDs display strong correlation. |                    |  |
|                           |                                     |    | 30 | 100 %      | 86 | 100 % |                                                                                       |                           |                   |                                                                                        |                    |  |
| Count of Adventure spaces | None chosen                         |    | 4  | 14%        |    |       | Chi squared test stat                                                                 | 19,60899238               | no Cramer's V     |                                                                                        |                    |  |
|                           |                                     | 9  |    |            | 5  | 9%    | Degrees of freedom                                                                    | 7                         |                   |                                                                                        |                    |  |
|                           | No. schools with 0 adventure spaces | 27 | 14 | 50%        | 13 | 24%   | p value                                                                               | 0,006479158               |                   |                                                                                        |                    |  |
|                           | No. schools with 1 adventure space  | 22 | 7  | 25%        | 15 | 28%   | Result                                                                                | REJECT H0                 |                   |                                                                                        |                    |  |
|                           | No. schools with 2 adventure spaces | 13 | 2  | 7%         | 11 | 20%   | Count of Adventure spaces and socioeconomic status of ECD centre are not independent. |                           |                   |                                                                                        |                    |  |
|                           | No. schools with 3 adventure spaces | 7  | 0  | 0%         | 7  | 13%   |                                                                                       |                           |                   |                                                                                        |                    |  |
|                           | No. schools with 4 adventure spaces | 2  | 0  | 0%         | 2  | 4%    |                                                                                       |                           |                   |                                                                                        |                    |  |

Comparison of outdoor play spaces in low versus high socioeconomic early childhood development centres in Johannesburg

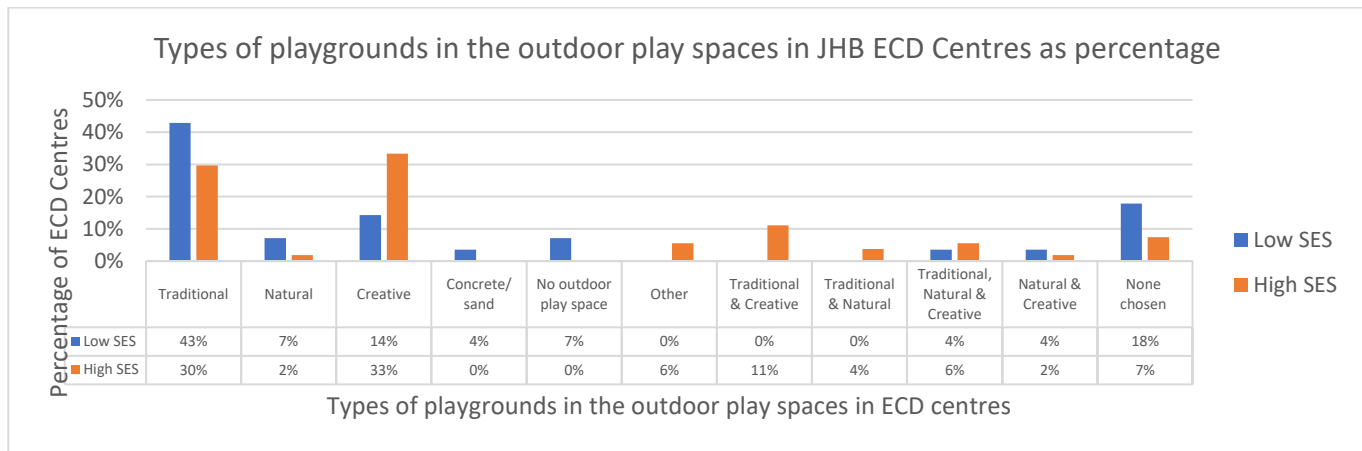
|  |                                     |   |    |      |    |      |  |  |
|--|-------------------------------------|---|----|------|----|------|--|--|
|  | No. schools with 5 adventure spaces | 2 | 1  | 4%   | 1  | 2%   |  |  |
|  | No. schools with 6 adventure spaces | 0 | 0  | 0%   | 0  | 0%   |  |  |
|  |                                     |   | 28 | 100% | 54 | 100% |  |  |

1

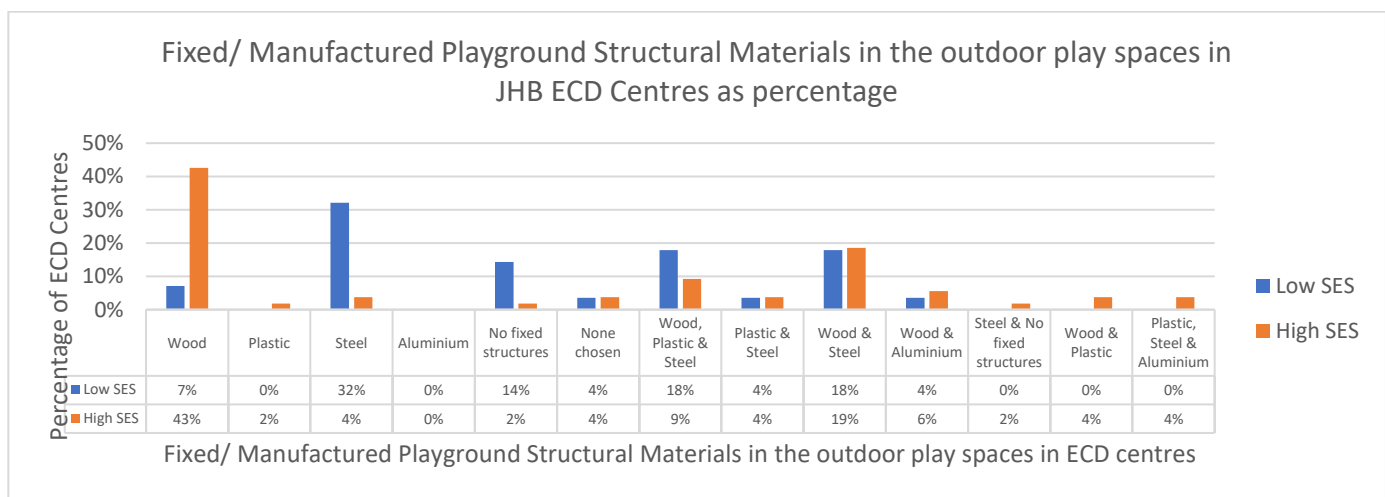
2

## Appendix O: Results Visuals – Summary of Component B

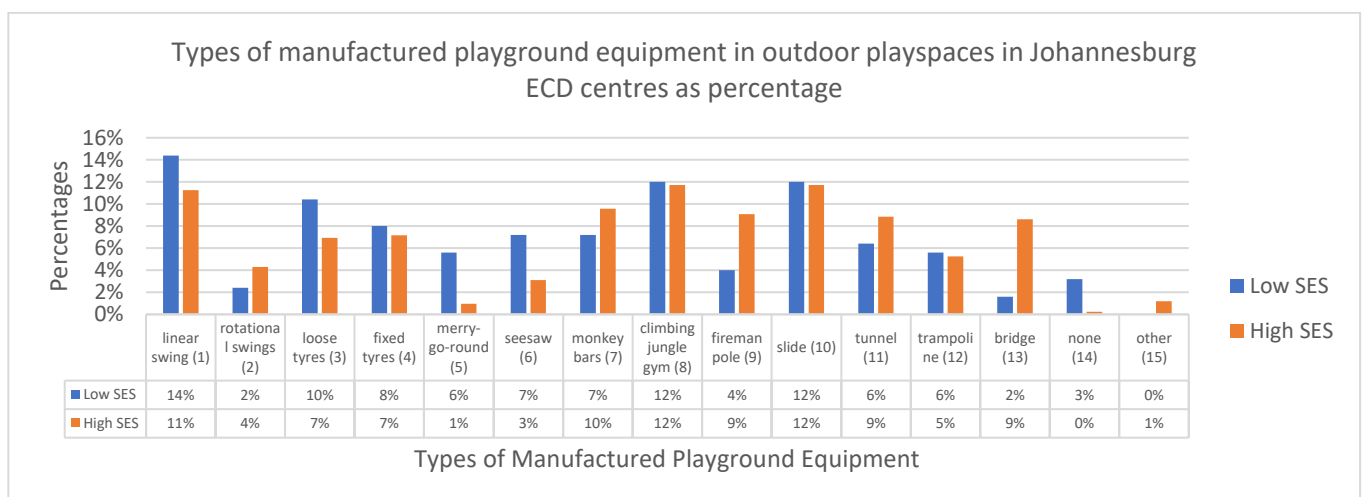
### B1 – A histogram depicting the types of playgrounds that best described the outdoor play space/s in Johannesburg ECD centres



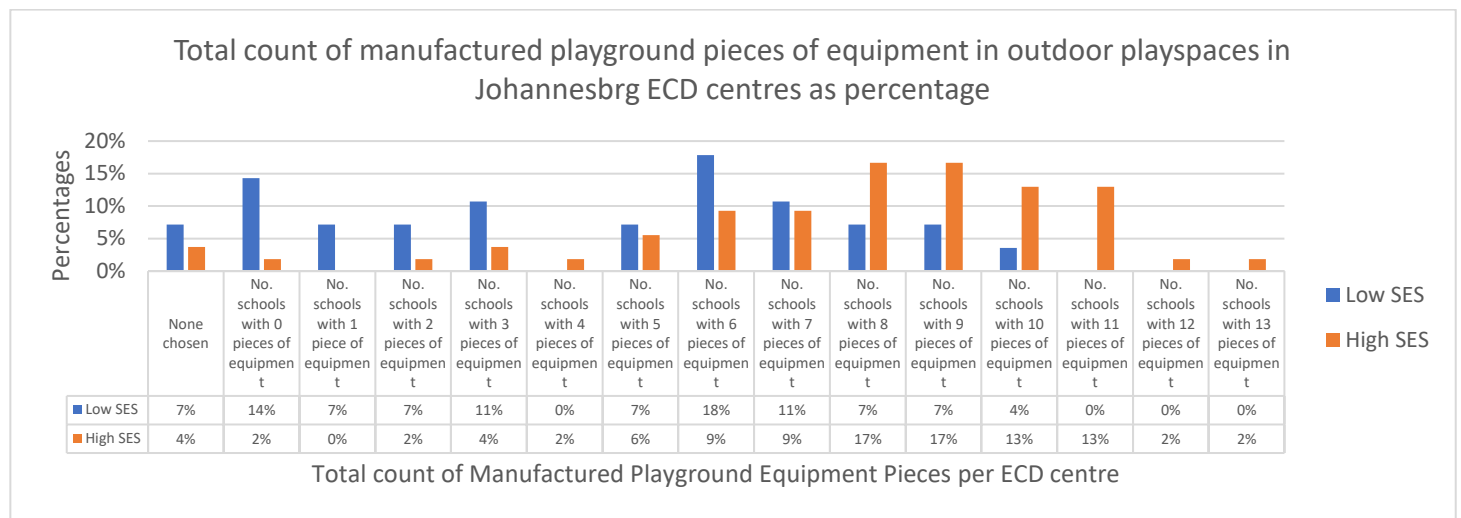
### B2 – A histogram depicting the structured materials that fixed manufactured playground structures are made of in the outdoor play space/s in Johannesburg ECD centres



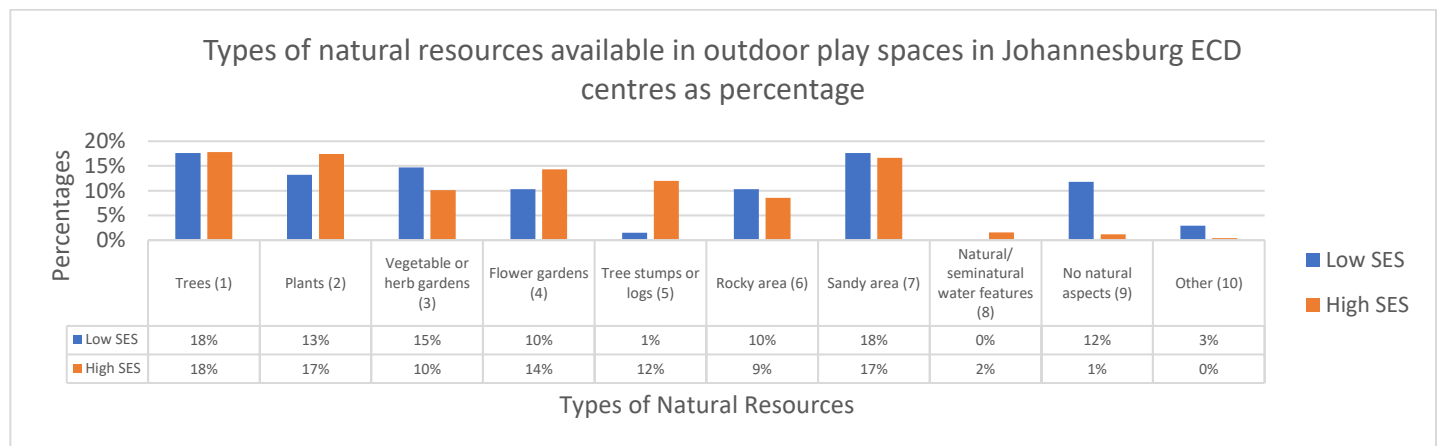
### B3.1 – A histogram depicting the types of manufactured playground equipment found in the outdoor play space/s in Johannesburg ECD centres



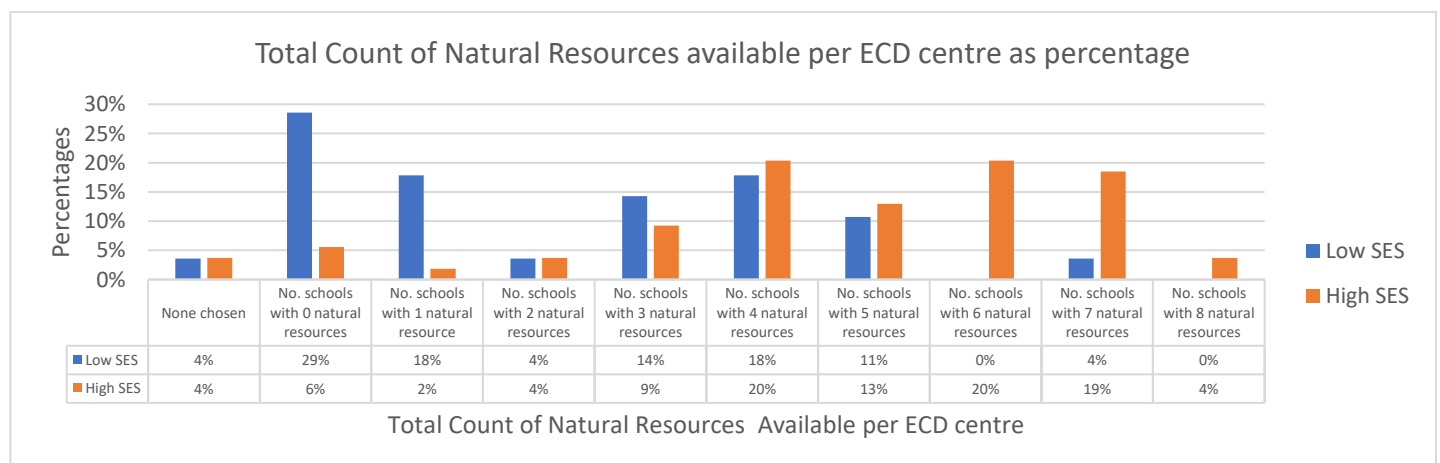
### B3.2- A histogram depicting the total count of manufactured playground pieces of equipment in outdoor play spaces in Johannesburg ECD centres



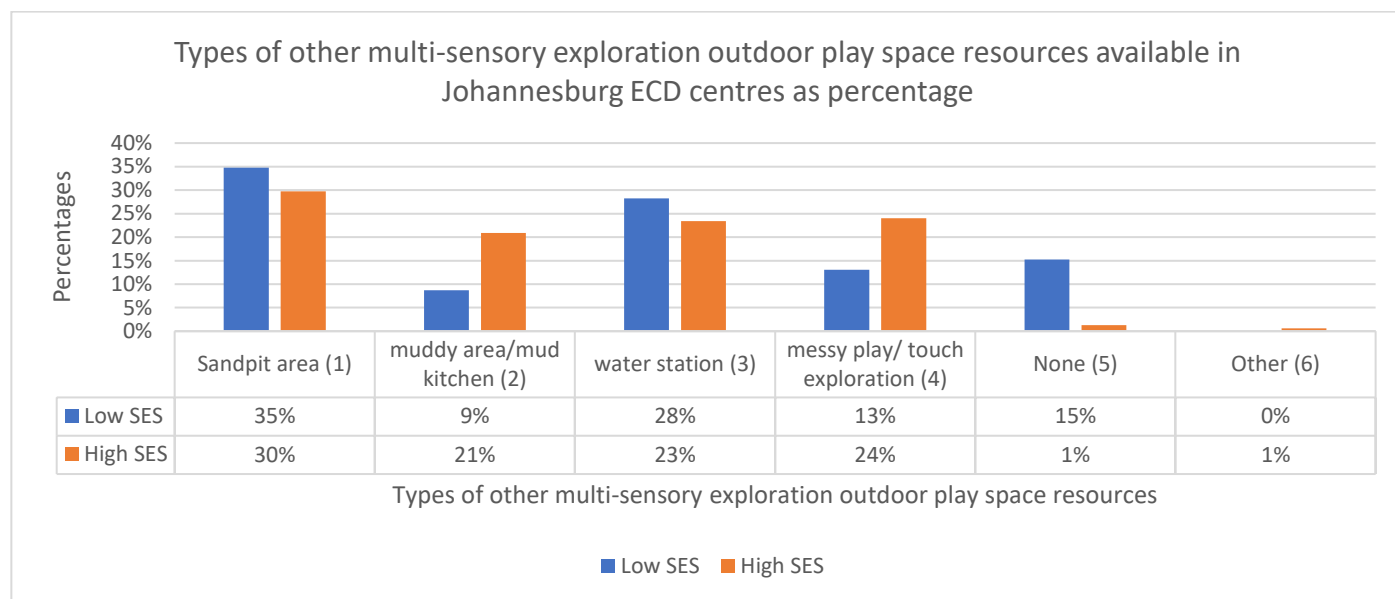
### B4.1- A histogram depicting the types of natural resources found in outdoor play spaces in Johannesburg ECD centres that might allow for further sensory exploration



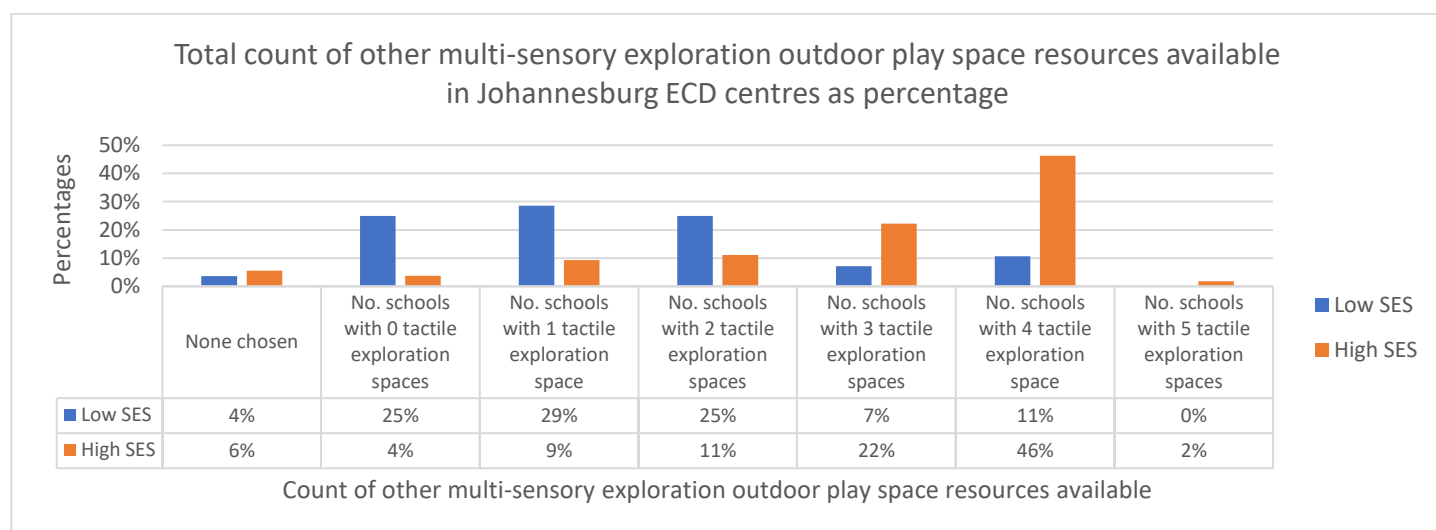
### B4.2- A histogram depicting the total count of natural resources found in outdoor play spaces in Johannesburg ECD centres that might allow for further sensory exploration



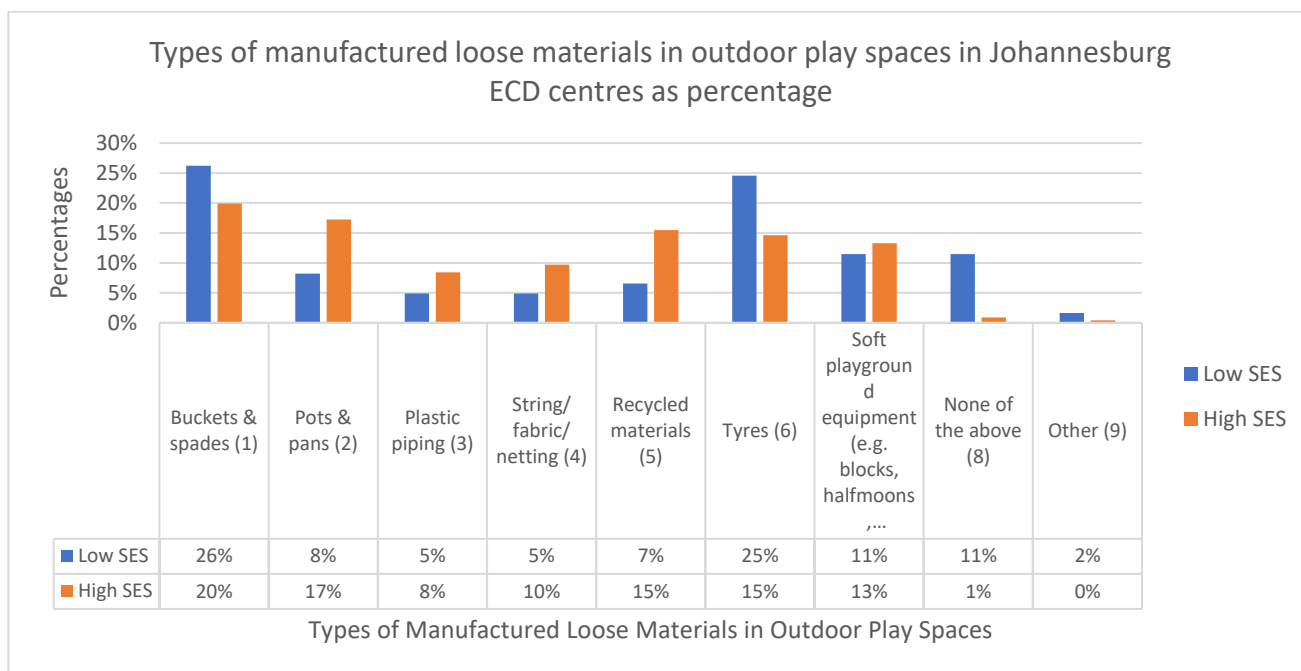
## B5.1- A histogram depicting the types of other multi-sensory exploration outdoor play area resources in Johannesburg ECD centres



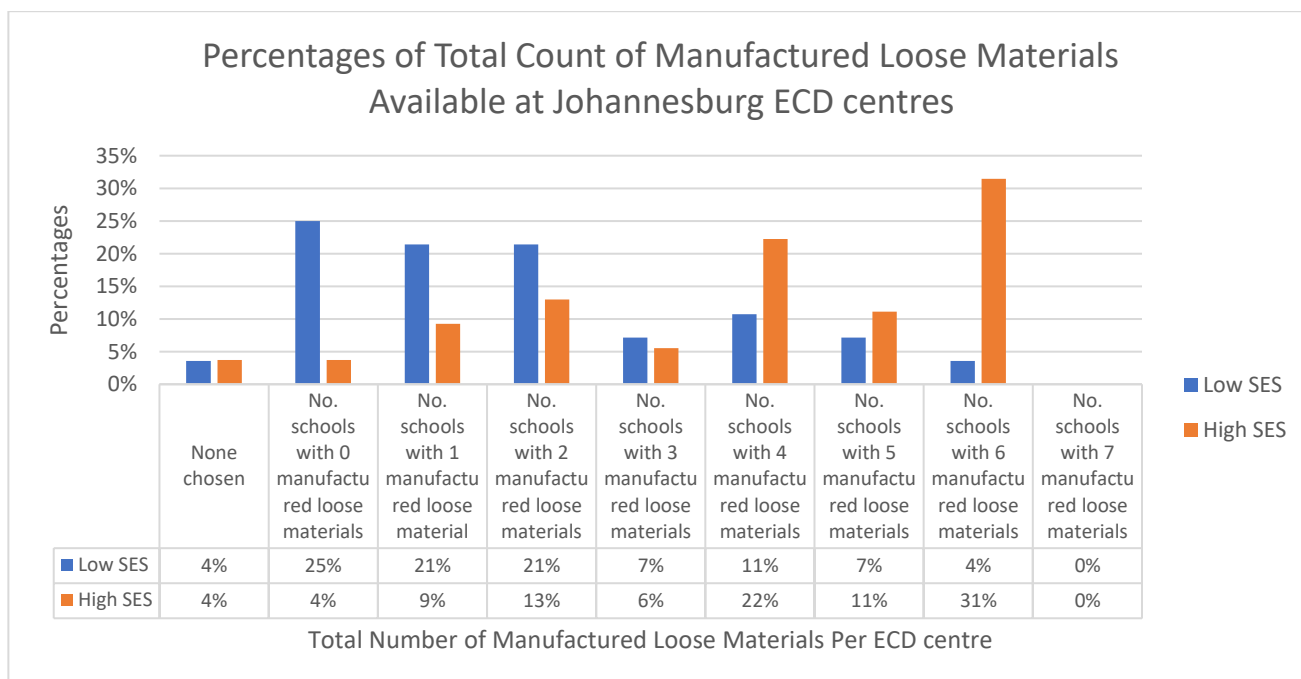
## B5 – A histogram depicting the total number of other tactile exploration outdoor play space resources available in Johannesburg ECD centres



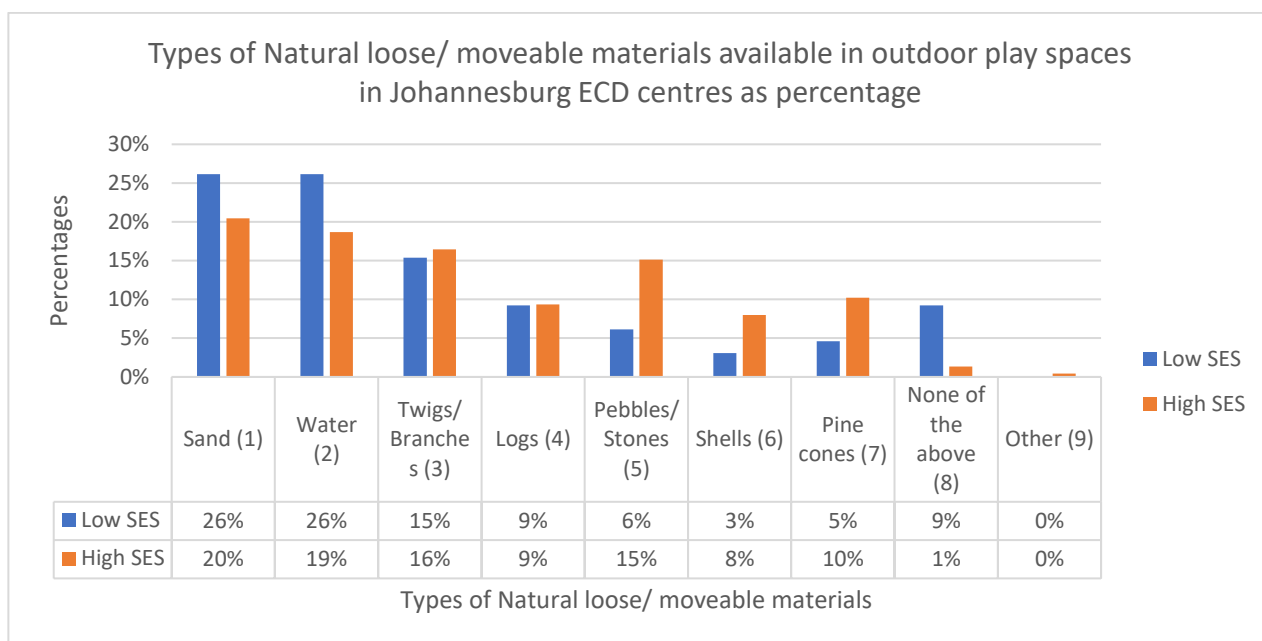
## B6.1- A histogram depicting the types of manufactured loose/ moveable materials in outdoor play spaces in Johannesburg ECD centres



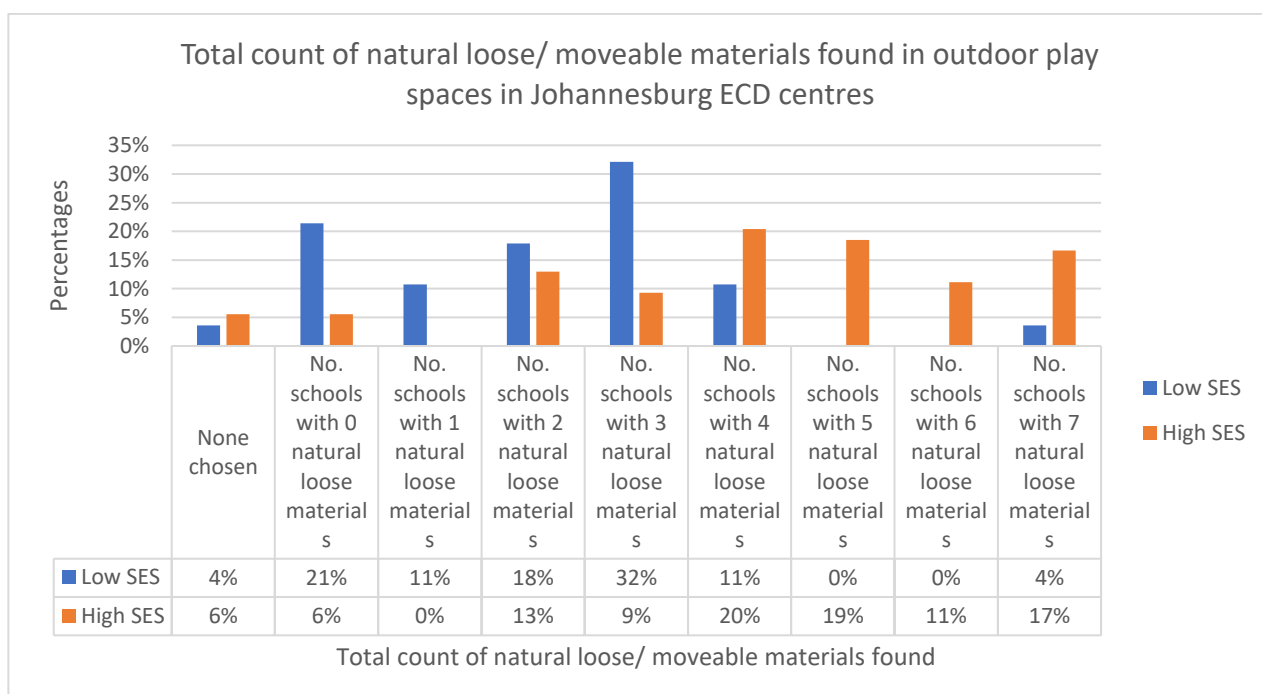
## B6.2- A histogram depicting the total count of manufactured loose/ moveable materials in outdoor play spaces in Johannesburg ECD centres that children can construct or engage creatively with



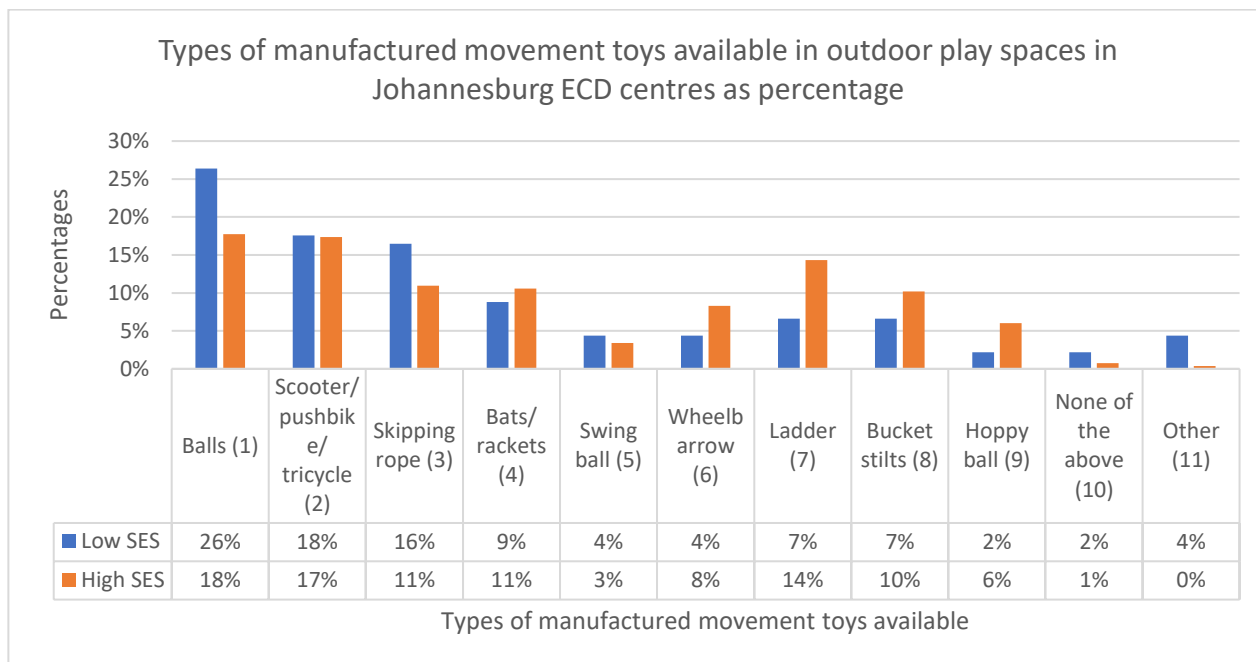
**B7.1 – A histogram depicting the types of natural loose/ moveable materials found in the outdoor play space in Johannesburg ECD centres that children can construct or engage creatively with**



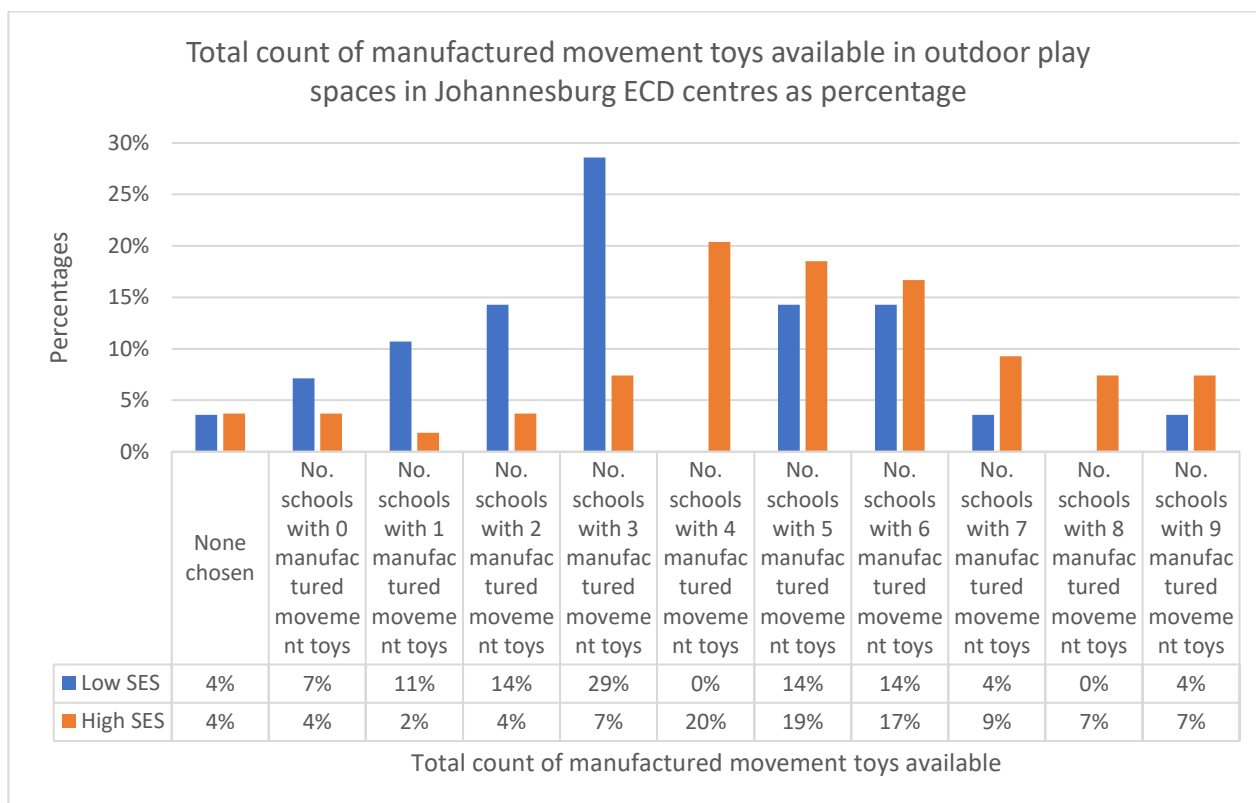
**B7.2 – A histogram depicting the total count of natural loose/ moveable materials found in the outdoor play space in Johannesburg ECD centres that children can construct or engage creatively with**



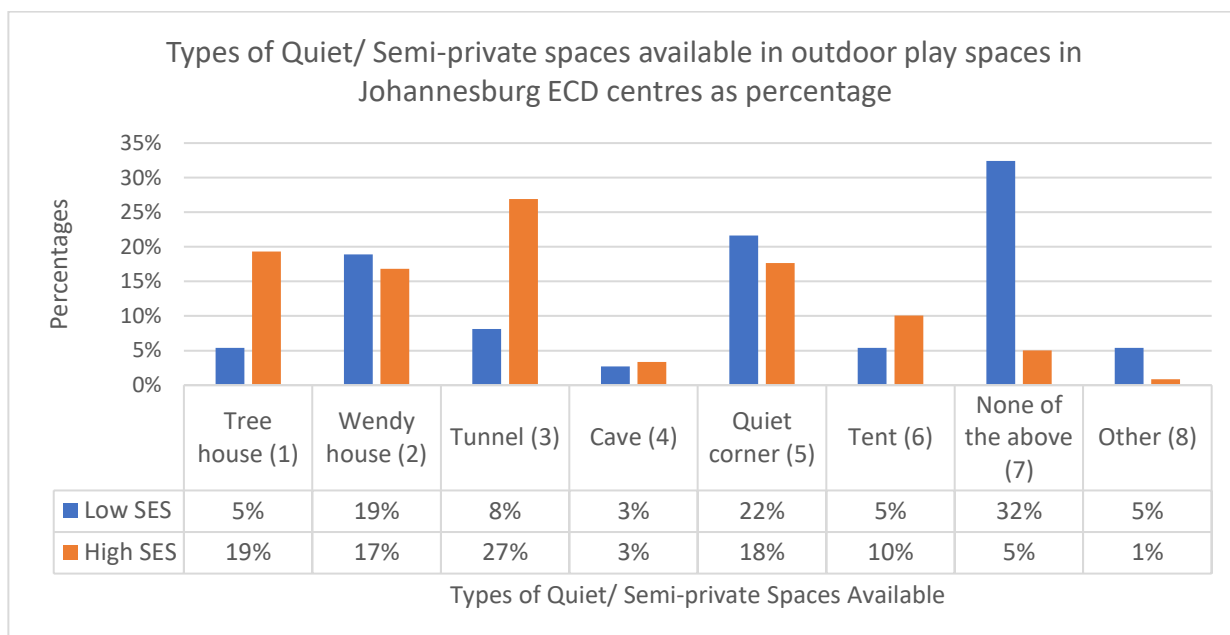
**B8.1 – A histogram depicting the types of manufactured movement toys available in outdoor play spaces in Johannesburg ECD centres that the children can move with**



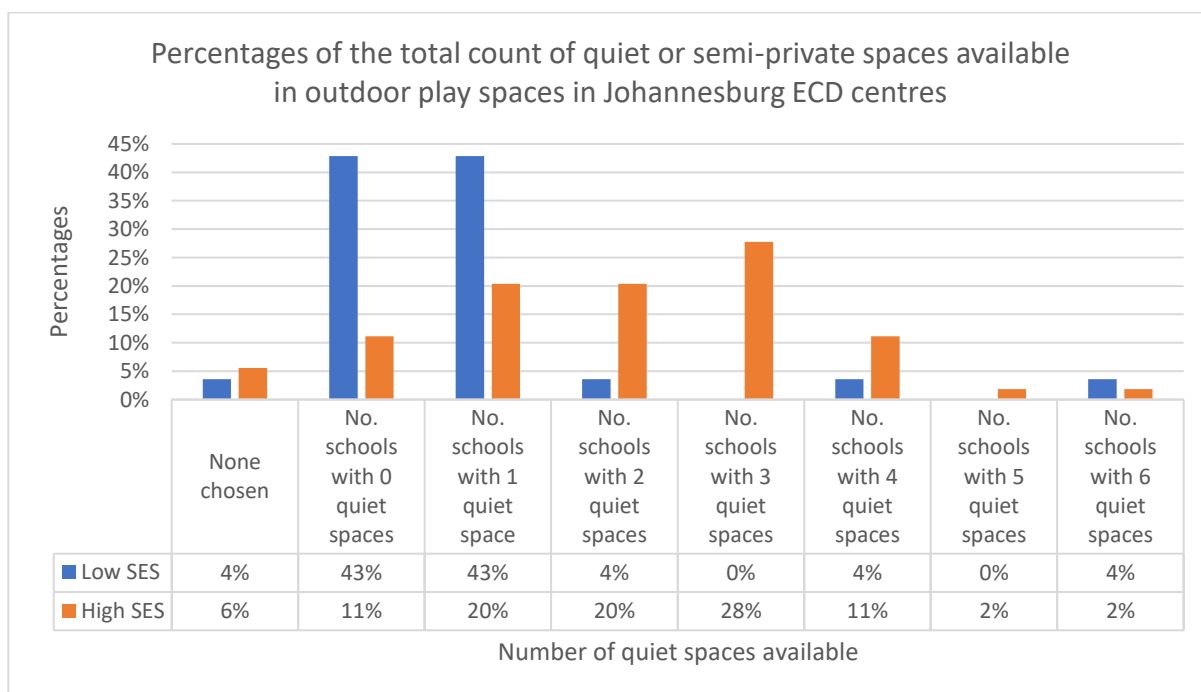
**B8.2 – A histogram depicting the total count of manufactured movement toys available in outdoor play spaces in Johannesburg ECD centres that the children can move with**



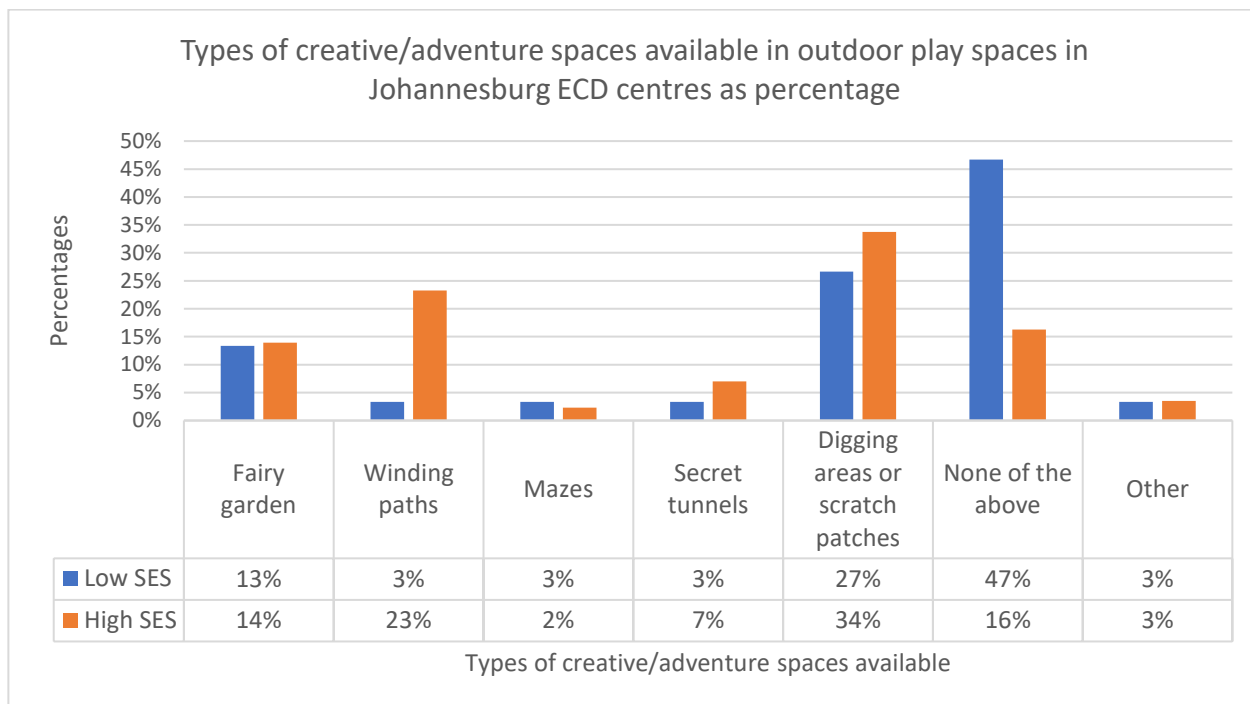
## B9.1 – A histogram depicting the types of quiet or semi-private spaces that allow for quiet time in the outdoor play spaces in Johannesburg ECD centres



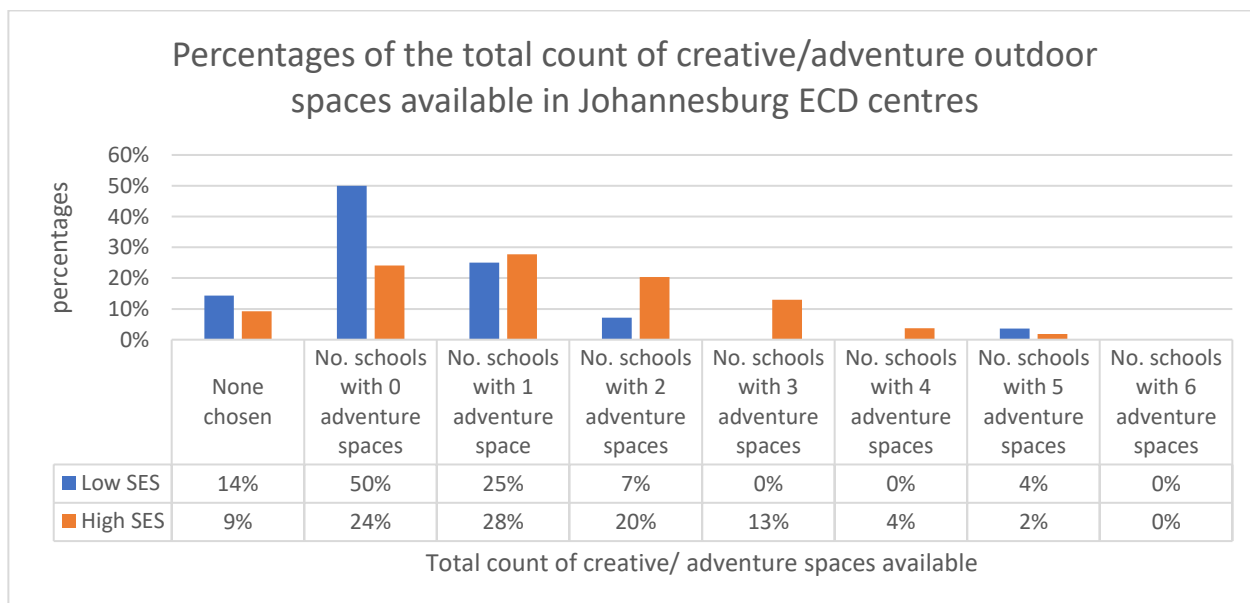
## B9.2 – A histogram depicting the total count of quiet or semi-private spaces that allow for quiet time in the outdoor play spaces in Johannesburg ECD centres



**B10.1 – A histogram depicting the types of creative or adventure spaces that there are for children’s creative play in the outdoor play spaces in Johannesburg ECD centres**



**B10.2 – A histogram depicting the total count of creative or adventure spaces that there are for children’s creative play in the outdoor play spaces in Johannesburg ECD centres**



## Appendix P: Results – Content Analysis for Qualitative Data in Component B

- other\_b1\_v2: If other types of playground would better describe the outdoor play space at the ECD centre, please describe:
  - We have 1 swing, 1 slide and 1 car steel
  - We have traditional fixed equipment and assorted equipment we bring out on different days.
  - Small paved area with a sand pit and som grass , tires .
- other\_b3\_v2: If other types of manufactured playground equipment are available that the children can move on at the ECD centre, please describe:
  - climbing wall, ninja rope
  - Loads of moveable planks, oil-cloth covered foam shapes, 'plastic steps' and much more.
  - MUD KITCHEN, GARDEN CENTER
  - balancing beam
  - mini zipline
  - Sandpits, rock climbing wall etc
- other\_b4\_v2: If other types of natural resources that might allow for further sensory exploration are found in the ECD centre, please describe:
  - Different sensory trays - some changed weekly, some daily - inside and outside
  - just grass
  - Flower gardens are only small pots
- other\_b5\_v2: If other types of tactile exploration resources are available in the ECD centre, please describe:
  - water pump
- other\_b6\_v2: If other types of manufactured loose/ moveable materials are found that the children can construct or engage creatively with, please describe:
  - chess pieces, jenga blocks
  - Often these things are kept in the store room
- other\_b7\_v2: If other types of natural loose/ moveable materials are found that the children can engage constructively with, please describe:
  - tree stump
- other\_b8\_v2: If other types of manufactured movement toys are found that the children can move with, please describe:
  - wagons
  - Hola hoops
  - Hola hoops
  - Random toys - action figures, dolls, that they take outside
  - Small slide, little garden house. We have very little/ few of all resources.
- other\_b9\_v2: If other types of quiet or semi-private spaces are found that allow for quiet time, please describe:
  - Gazebo
  - only for behaviour management
  - Quiet time is just going anywhere outside.
- other\_b10\_v2: If other types of creative or adventure spaces that allow for childrne's creative play are found, please describe:
  - The children often make their own spaces for adventure using the movable equipment and fabrics.
  - environment area where we study items we find in the garden... with magnifying glasses and then we paint them or draw them
  - bicycle tracks, sandpits, equipment to build an adventure space
  - Digging area very small

## Appendix Q: Results and Data Analysis – Tabular summary of Component C (Descriptive and Inferential Statistics)

**Appendix Table 8. A table outlining a summary of the results and data analysis of component C using both descriptive and inferential statistics**

| Characte<br>ristics | Category | To<br>tal | Low ECD<br>(freq) | Low<br>ECD<br>(%) | High ECD<br>(freq) | High<br>ECD (%) | Chi Squared Test For<br>Independence                                                                                                                                                                                                                                                                               | Cramer's V<br>(Measure of<br>association)                                                                                                                                                                                                                                                                                                                                         |
|---------------------|----------|-----------|-------------------|-------------------|--------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |          |           |                   |                   |                    |                 | <p><b>H0: Socioeconomic status of ECD centre and XXX are independent.</b></p> <p><b>H1: Socioeconomic status of ECD centre and XXX are NOT independent</b></p> <p>Expected values: (row sum * col sum) / total sum</p> <p><math>(obs - exp)^2 / exp</math></p> <p><b>Reject H0 if <math>p &lt; 0.05</math></b></p> | <p>Cramer's v = <math>\sqrt{(x^2/n) / \min(c-1, r-1)}</math> where x2 is the chi-squared test stat</p> <p>Cramer's v is a measure of the strength of association between two nominal variables. It ranges from 0 to 1 where: 0 indicates no association between the two variables. 1 indicates a strong association between the two variables.</p> <p>Dof: degrees of freedom</p> |

|                         |                            |    |    |      |     |      |                                                                             |                                |                                                                              |                    |
|-------------------------|----------------------------|----|----|------|-----|------|-----------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------|--------------------|
| <b>Type of Terrain</b>  | Grass 1                    | 51 | 15 | 21%  | 36  | 18%  | <b>Chi squared test stat</b>                                                | 78,43161538                    | <b>sample size (n)</b>                                                       | 274                |
|                         | Sand 2                     | 52 | 15 | 21%  | 37  | 18%  | <b>Degrees of freedom</b>                                                   | 8                              | <b>c-1</b>                                                                   | 1                  |
|                         | Concrete 3                 | 46 | 20 | 28%  | 26  | 13%  | <b>p value</b>                                                              | 0,0000000000000101076087593561 | <b>r-1</b>                                                                   | 8                  |
|                         | Bricks 4                   | 39 | 6  | 8%   | 33  | 16%  | <b>Result</b>                                                               | REJECT H0                      | <b>dof: min(c-1,r-1)</b>                                                     | 1                  |
|                         | Bark chips 5               | 8  | 1  | 1%   | 7   | 3%   | Type of Terrain and socioeconomic status of ECD centre are not independent. |                                | <b>Cramer's</b>                                                              | 0,53502            |
|                         | Recycled rubber 6          | 20 | 1  | 1%   | 19  | 9%   |                                                                             |                                | <b>correlation</b>                                                           | strong correlation |
|                         | Gravel 7                   | 16 | 7  | 10%  | 9   | 4%   |                                                                             |                                | Type of Terrain and socioeconomic status of ECDs display strong correlation. |                    |
|                         | Astroturf/ plastic grass 8 | 38 | 5  | 7%   | 33  | 16%  |                                                                             |                                |                                                                              |                    |
|                         | Other 9                    | 4  | 1  | 1%   | 3   | 1%   |                                                                             |                                |                                                                              |                    |
|                         |                            |    |    |      |     |      |                                                                             |                                |                                                                              |                    |
|                         |                            |    | 71 | 100% | 203 | 100% |                                                                             |                                |                                                                              |                    |
| <b>Count of Terrain</b> | None chosen                | 4  | 1  | 4%   | 3   | 6%   | <b>Chi squared test stat</b>                                                | 27,34149636                    | no Cramer's V since ordinal categorical variable                             |                    |

|      |                                     |    |    |      |    |      |                                                                              |             |                                                  |
|------|-------------------------------------|----|----|------|----|------|------------------------------------------------------------------------------|-------------|--------------------------------------------------|
|      | No. schools with 0 types of terrain | 0  | 0  | 0%   | 0  | 0%   | Degrees of freedom                                                           | 9           |                                                  |
|      | No. schools with 1 types of terrain | 14 | 9  | 32%  | 5  | 9%   | p value                                                                      | 0,001227888 |                                                  |
|      | No. schools with 2 types of terrain | 6  | 4  | 14%  | 2  | 4%   | Result                                                                       | REJECT H0   |                                                  |
|      | No. schools with 3 types of terrain | 21 | 8  | 29%  | 13 | 24%  | Count of Terrain and socioeconomic status of ECD centre are not independent. |             |                                                  |
|      | No. schools with 4 types of terrain | 13 | 3  | 11%  | 10 | 19%  |                                                                              |             |                                                  |
|      | No. schools with 5 types of terrain | 15 | 2  | 7%   | 13 | 24%  |                                                                              |             |                                                  |
|      | No. schools with 6 types of terrain | 6  | 0  | 0%   | 6  | 11%  |                                                                              |             |                                                  |
|      | No. schools with 7 types of terrain | 2  | 0  | 0%   | 2  | 4%   |                                                                              |             |                                                  |
|      | No. schools with 8 types of terrain | 1  | 1  | 4%   | 0  | 0%   |                                                                              |             |                                                  |
|      |                                     |    | 28 | 100% | 54 | 100% |                                                                              |             |                                                  |
|      |                                     |    |    |      |    |      |                                                                              |             |                                                  |
|      |                                     |    |    |      |    |      |                                                                              |             |                                                  |
|      |                                     |    |    |      |    |      |                                                                              |             |                                                  |
|      |                                     |    |    |      |    |      |                                                                              |             |                                                  |
| Size | 0-20 square metres                  | 5  | 3  | 11%  | 2  | 4%   | Chi squared test stat:                                                       | 25,46325269 | no Cramer's V since ordinal categorical variable |
|      | 21-50 square metres                 | 16 | 10 | 36%  | 6  | 11%  | Degrees of freedom                                                           | 6           |                                                  |

|              |                               |    |    |      |    |      |                                                                  |             |                          |                      |
|--------------|-------------------------------|----|----|------|----|------|------------------------------------------------------------------|-------------|--------------------------|----------------------|
|              | 51-100 square metres          | 14 | 7  | 25%  | 7  | 13%  | <b>p value</b>                                                   | 0,000280179 |                          |                      |
|              | 101-150 square metres         | 9  | 1  | 4%   | 8  | 15%  | <b>Result</b>                                                    | REJECT H0   |                          |                      |
|              | 151-200 square metres         | 7  | 1  | 4%   | 6  | 11%  | Size and socioeconomic status of ECD centre are not independent. |             |                          |                      |
|              | Bigger than 200 square metres | 26 | 4  | 14%  | 22 | 41%  |                                                                  |             |                          |                      |
|              | None chosen                   | 5  | 2  | 7%   | 3  | 6%   |                                                                  |             |                          |                      |
|              |                               |    | 28 | 100% | 54 | 100% |                                                                  |             |                          |                      |
| <b>Shade</b> | Yes                           |    | 20 | 71   |    |      | <b>Chi squared test stat</b>                                     |             | <b>sample size (n)</b>   |                      |
|              |                               | 69 |    |      | 49 | 91%  |                                                                  | 15,97163547 |                          | 82                   |
|              | No                            |    | 6  | 21   |    |      | <b>Degrees of freedom</b>                                        |             | <b>c-1</b>               |                      |
|              |                               | 9  |    |      | 3  | 6%   |                                                                  | 2           |                          | 1                    |
|              | None chosen                   |    | 2  | 7    |    |      | <b>p value</b>                                                   |             | <b>r-1</b>               |                      |
|              |                               | 4  |    |      | 2  | 4%   |                                                                  | 0,000340254 |                          | 2                    |
|              |                               |    |    |      |    |      | <b>Result</b>                                                    | REJECT H0   | <b>dof: min(c-1,r-1)</b> | 1                    |
|              |                               |    |    |      |    |      | Shade and socioeconomic status of ECD centre are not independent |             | <b>Cramer's V</b>        | 0,441334             |
|              |                               |    |    |      |    |      |                                                                  |             | <b>correlation</b>       | moderate correlation |

|                |                     |    |    |      |    |      |                                                                            |             |                                                                       |          |
|----------------|---------------------|----|----|------|----|------|----------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------|----------|
|                |                     |    |    |      |    |      |                                                                            |             | Shade and socio economic status of ECDs display moderate correlation. |          |
| Height         | 0-1 metre           | 2  | 2  | 7%   | 0  | 0%   | Chi squared test stat                                                      | 23,299049   | no Cramer's V since ordinal categorical variable                      |          |
|                | 1-2 metres          | 33 | 12 | 43%  | 21 | 39%  | Degrees of freedom                                                         | 7           |                                                                       |          |
|                | 2-3 metres          | 16 | 1  | 4%   | 15 | 28%  | p value                                                                    | 0,001511721 |                                                                       |          |
|                | 3-4 metres          | 11 | 2  | 7%   | 9  | 17%  | Result                                                                     | REJECT H0   |                                                                       |          |
|                | 4-5 metres          | 6  | 3  | 11%  | 3  | 6%   | Height and socioeconomic status of ECD centre are not independent.         |             |                                                                       |          |
|                | above 5 metres      | 4  | 3  | 11%  | 1  | 2%   |                                                                            |             |                                                                       |          |
|                | Nothing of height   | 5  | 3  | 11%  | 2  | 4%   |                                                                            |             |                                                                       |          |
|                | None chosen         | 5  | 2  | 7%   | 3  | 6%   |                                                                            |             |                                                                       |          |
|                |                     |    | 28 | 100% | 54 | 100% |                                                                            |             |                                                                       |          |
| Terrain safety | Grass 1             | 43 | 13 | 35%  | 30 | 36%  | Chi squared test stat                                                      | 27,08579184 | sample size (n)                                                       | 120      |
|                | Sand 2              | 28 | 8  | 22%  | 20 | 24%  | Degrees of freedom                                                         | 6           | c-1                                                                   | 1        |
|                | Recycled rubber 3   | 13 | 4  | 11%  | 9  | 11%  | p value                                                                    | 0,000139545 | r-1                                                                   | 6        |
|                | Bark chips 4        | 6  | 1  | 3%   | 5  | 6%   | Result                                                                     | REJECT H0   | dof: min(c-1,r-1)                                                     | 1        |
|                | None of the above 5 | 14 | 9  | 24%  | 5  | 6%   | Terrain safety and socioeconomic status of ECD centre are not independent. |             | Cramer's V                                                            | 0,475095 |
|                | Other 6             | 12 | 1  | 3%   | 11 | 13%  |                                                                            |             | correlation                                                           | moderate |

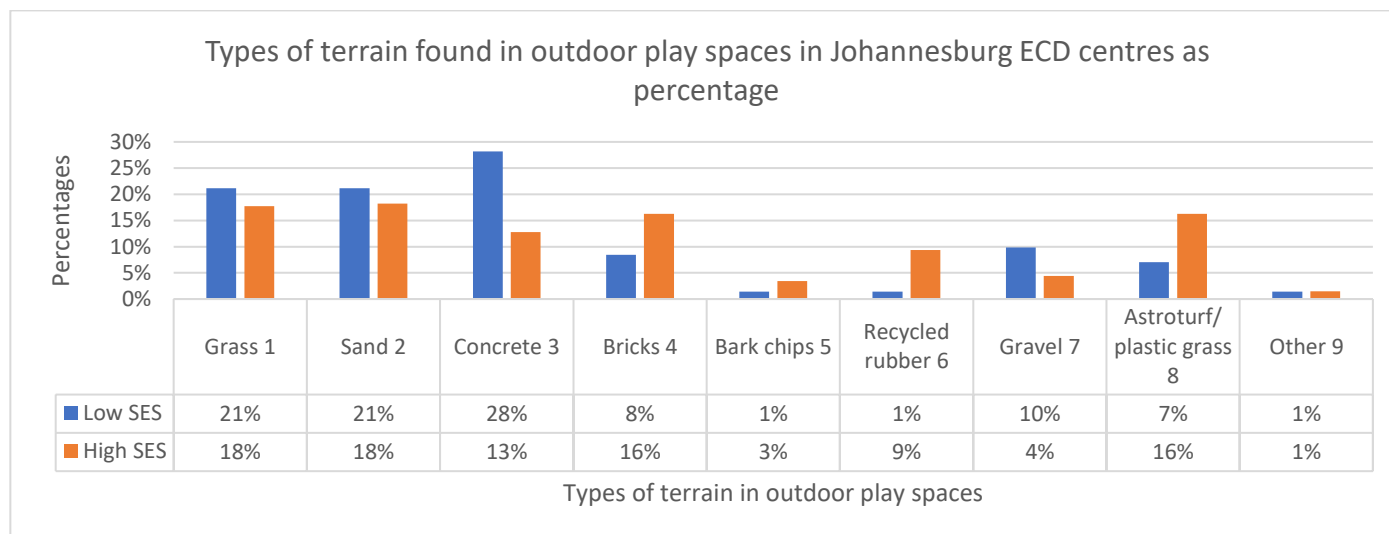
|       |               |    |    |      |      |      |                                                                         |             |                                                                                               |                                 |   |
|-------|---------------|----|----|------|------|------|-------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------|---------------------------------|---|
|       |               |    |    |      |      |      |                                                                         |             |                                                                                               | correlati<br>on                 |   |
|       | None chosen 7 | 4  | 1  | 3%   | 3    | 4%   |                                                                         |             | Terrain safety<br>and socio<br>economic status<br>of ECDs display<br>moderate<br>correlation. |                                 |   |
|       |               |    |    |      |      |      |                                                                         |             |                                                                                               |                                 |   |
|       |               |    | 37 | 100% | 83   | 100% |                                                                         |             |                                                                                               |                                 |   |
| Water | Yes           | 78 | 27 | 96%  | 51   | 94%  | Chi<br>squared<br>test stat                                             | 15,70164479 | sampl<br>e size<br>(n)                                                                        | 82                              |   |
|       | No            | 1  | 0  | 0%   | 1    | 2%   | Degrees<br>of<br>freedom                                                | 2           | c-1                                                                                           | 1                               |   |
|       | None chosen   | 3  | 1  | 4%   | 2    | 4%   | p value                                                                 | 0,000389432 | r-1                                                                                           | 2                               |   |
|       |               |    |    | 28   | 100% | 54   | 100%                                                                    | Result      | REJECT H0                                                                                     | dof:<br>min(c-<br>1,r-1)        | 1 |
|       |               |    |    |      |      |      | Water and socioeconomic<br>status of ECD centre are not<br>independent. |             | Crame<br>r's V                                                                                | 0,43758<br>8                    |   |
|       |               |    |    |      |      |      |                                                                         |             | correl<br>ation                                                                               | modera<br>te<br>correlati<br>on |   |
|       |               |    |    |      |      |      |                                                                         |             | Water and socio<br>economic status<br>of ECDs display<br>moderate<br>correlation.             |                                 |   |

|                 |             |    |    |      |    |      |                                                                      |                   |                          |                      |
|-----------------|-------------|----|----|------|----|------|----------------------------------------------------------------------|-------------------|--------------------------|----------------------|
| <b>Bathroom</b> | Yes         | 76 | 24 | 86%  | 52 | 96%  | <b>Chi squared test stat</b>                                         | 17,213331         | <b>sample size (n)</b>   | 82                   |
|                 | No          | 2  | 2  | 7%   | 0  | 0%   | <b>Degrees of freedom</b>                                            | 2                 | <b>c-1</b>               | 1                    |
|                 | None chosen | 4  | 2  | 7%   | 2  | 4%   | <b>p value</b>                                                       | 0,000182883       | <b>r-1</b>               | 2                    |
|                 |             |    | 28 | 100% | 54 | 100% | <b>Result</b>                                                        | REJECT H0         | <b>dof: min(c-1,r-1)</b> | 1                    |
|                 |             |    |    |      |    |      | Bathroom and socioeconomic status of ECD centre are not independent. | <b>Cramer's V</b> | <b>correlation</b>       | moderate correlation |
|                 |             |    |    |      |    |      |                                                                      |                   |                          |                      |
|                 |             |    |    |      |    |      |                                                                      |                   |                          |                      |
| <b>Storage</b>  | Yes         | 78 | 26 | 93%  | 52 | 96%  | <b>Chi squared test stat</b>                                         | 16,37441646       | <b>sample size (n)</b>   | 82                   |
|                 | No          | 1  | 1  | 4%   | 0  | 0%   | <b>Degrees of freedom</b>                                            | 2                 | <b>c-1</b>               | 1                    |
|                 | None chosen | 3  | 1  | 4%   | 2  | 4%   | <b>p value</b>                                                       | 0,000278189       | <b>r-1</b>               | 2                    |
|                 |             |    | 28 | 100% | 54 | 100% | <b>Result</b>                                                        | REJECT H0         | <b>dof: min(c-1,r-1)</b> | 1                    |
|                 |             |    |    |      |    |      |                                                                      |                   |                          |                      |

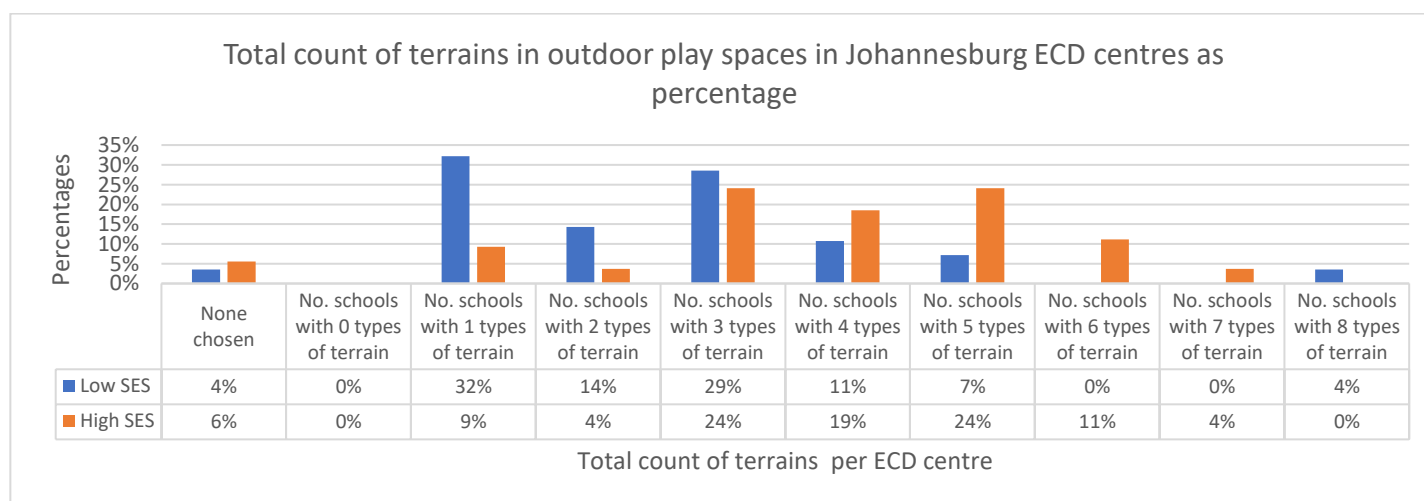
|          |                                |    |    |      |     |      |                                                                        |             |                                                                         |                      |
|----------|--------------------------------|----|----|------|-----|------|------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------|----------------------|
|          |                                |    |    |      |     |      | Storage and socioeconomic status of ECD centre are not independent.    |             | <b>Cramer's V</b>                                                       | 0,446865             |
|          |                                |    |    |      |     |      |                                                                        |             | <b>correlation</b>                                                      | moderate correlation |
|          |                                |    |    |      |     |      |                                                                        |             | Storage and socio economic status of ECDs display moderate correlation. |                      |
| Security |                                |    |    |      |     |      | <b>Chi squared test stat</b>                                           | 51,83964167 | <b>sample size (n)</b>                                                  | 182                  |
|          | Brick walls                    | 56 | 21 | 49%  | 35  | 25%  |                                                                        |             | <b>c-1</b>                                                              | 1                    |
|          | Electric fence                 | 27 | 2  | 5%   | 25  | 18%  |                                                                        |             | <b>r-1</b>                                                              | 8                    |
|          | Alarm system                   | 34 | 4  | 9%   | 30  | 22%  |                                                                        |             | <b>dof: min(c-1,r-1)</b>                                                | 1                    |
|          | Plastic/ steel/ wooden fencing | 27 | 4  | 9%   | 23  | 17%  | <b>Degrees of freedom</b>                                              | 8           | <b>Cramer's V</b>                                                       | 0,533698             |
|          | Barbed wire                    | 9  | 5  | 12%  | 4   | 3%   | <b>p value</b>                                                         | 1,80746E-08 |                                                                         |                      |
|          | Trees or plants                | 19 | 3  | 7%   | 16  | 12%  | <b>Result</b>                                                          | REJECT H0   | <b>correlation</b>                                                      | strong correlation   |
|          | None of the above              | 1  | 1  | 2%   | 0   | 0%   | Security and socioeconomic status of ECD centre are not independent.   |             |                                                                         |                      |
|          | Other                          | 6  | 2  | 5%   | 4   | 3%   |                                                                        |             |                                                                         |                      |
|          | None chosen                    | 3  | 1  | 2%   | 2   | 1%   |                                                                        |             |                                                                         |                      |
|          |                                |    | 43 | 100% | 139 | 100% | Security and socio economic status of ECDs display strong correlation. |             |                                                                         |                      |

## Appendix R: Results and Data Analysis– Visual summary of Component C

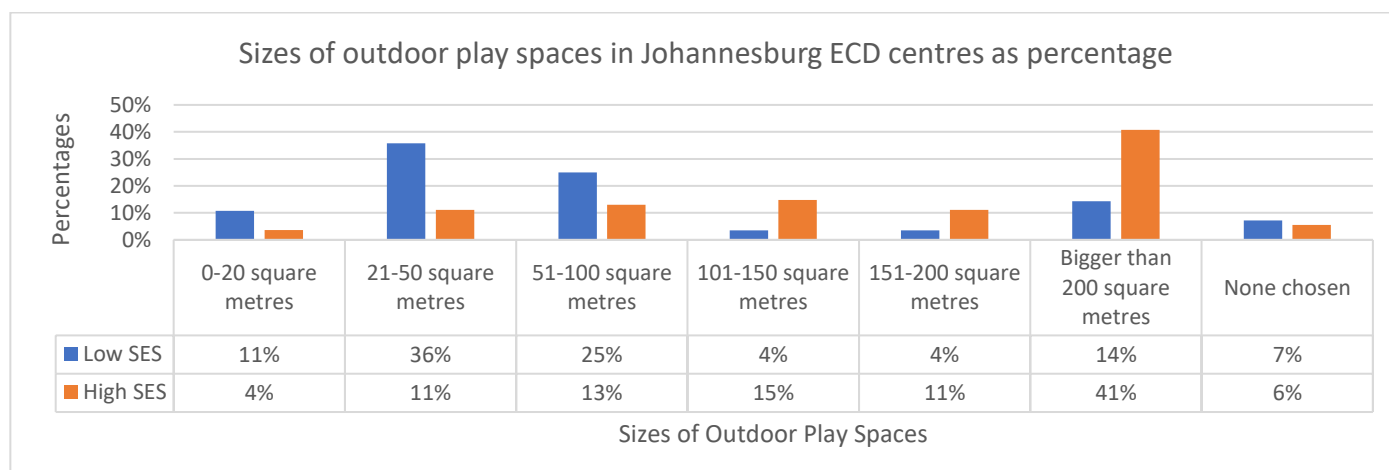
### C1.1 – A histogram depicting the types of terrain found in the outdoor play spaces in Johannesburg ECD centres



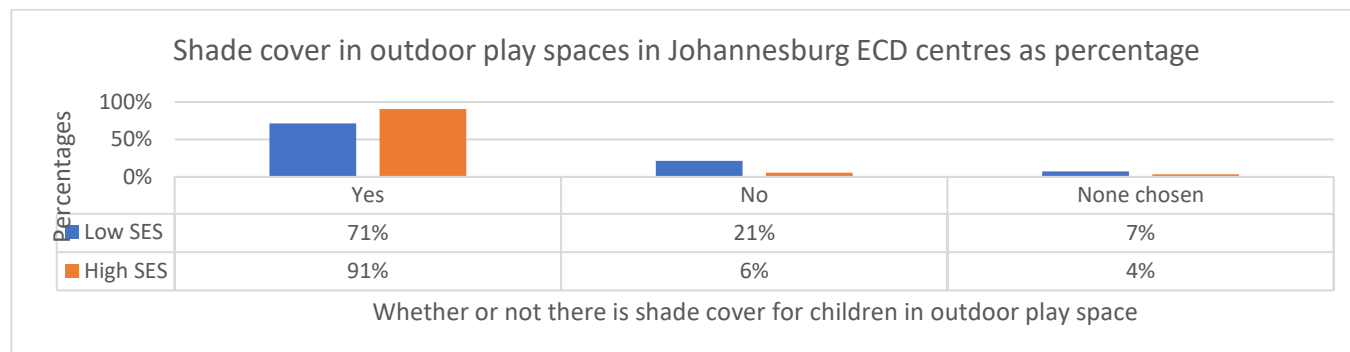
### C1.2 – A histogram depicting the total count of terrain types found in outdoor play spaces in Johannesburg ECD centres



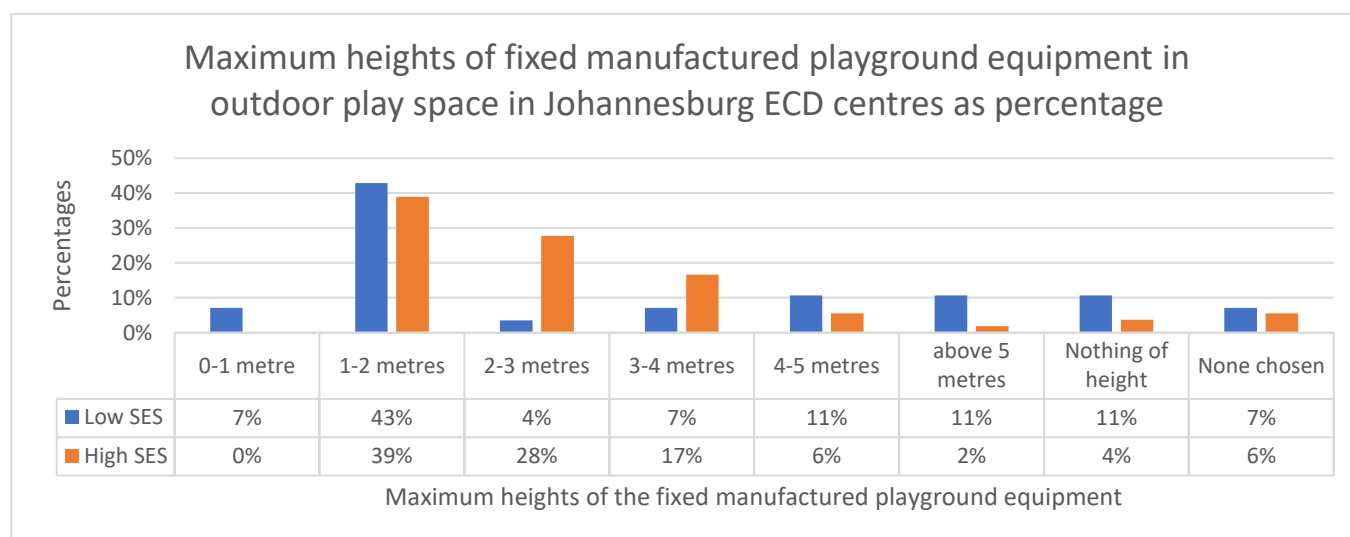
### C2 – A histogram depicting the sizes of outdoor play spaces in ECD centres



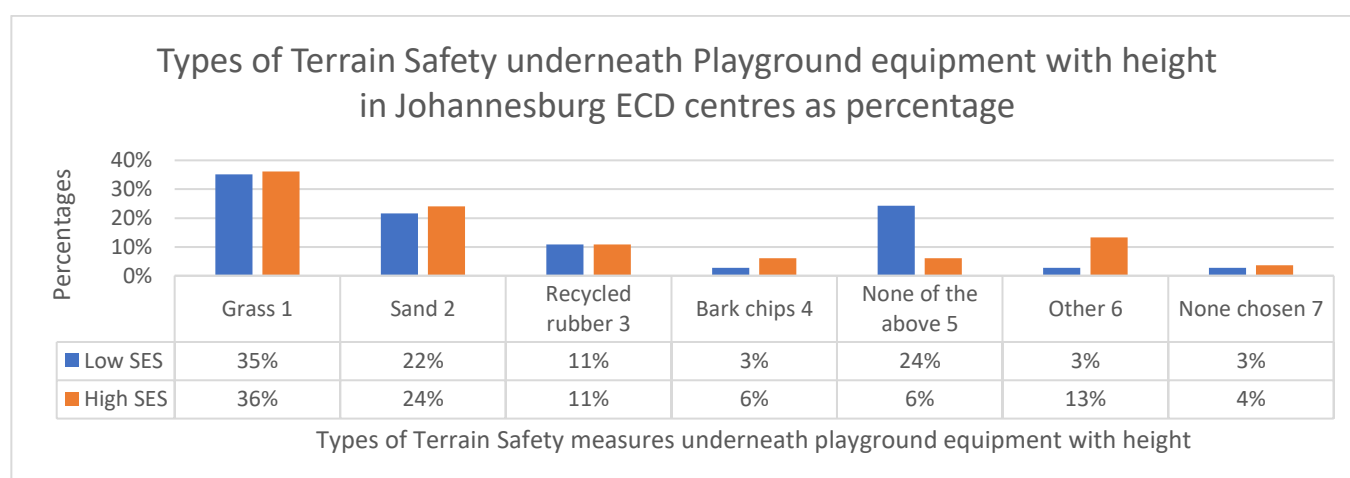
### C3 – A histogram depicting the shade cover of outdoor play spaces in Johannesburg ECD centres



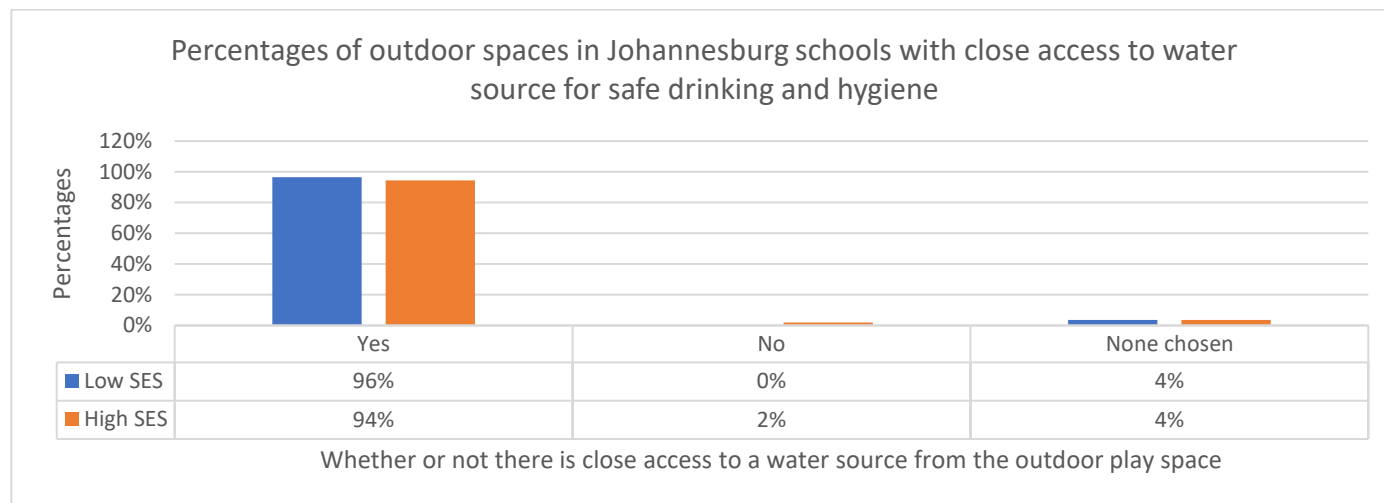
### C4 – A histogram depicting the maximum height of the fixed manufactured playground equipment in the outdoor play spaces in Johannesburg ECD centres



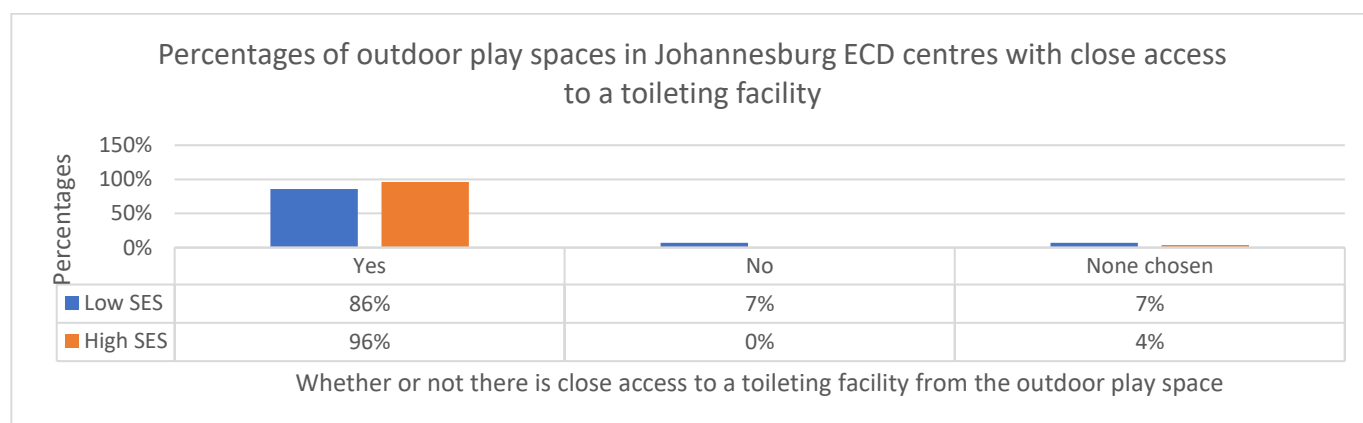
### C5 – A histogram depicting the types of terrain safety underneath the fixed manufactured playground structures with height in Johannesburg ECD centres



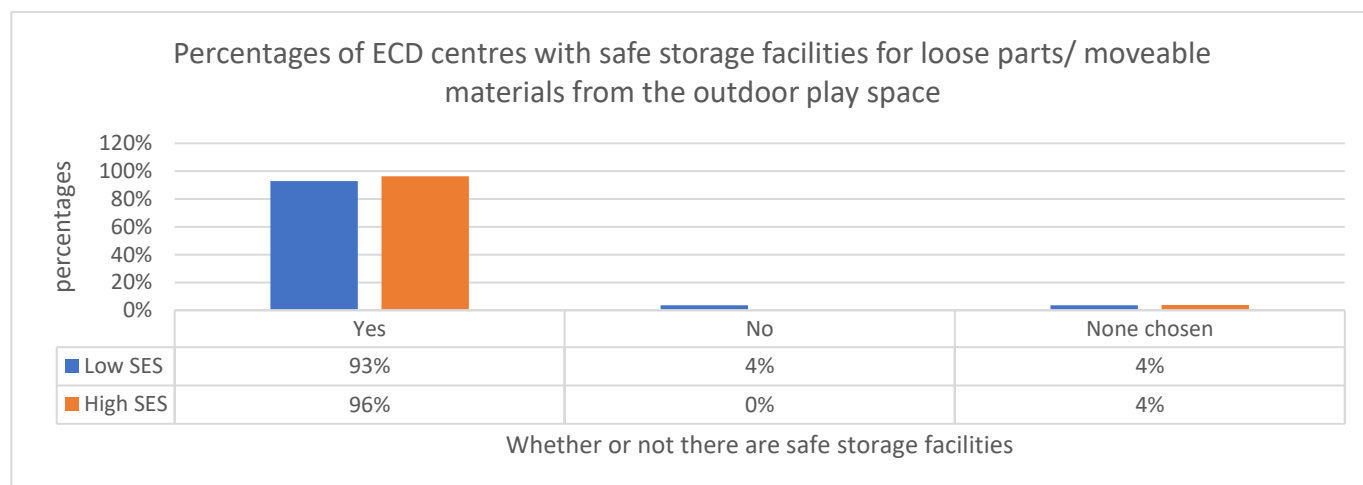
## C6 – A histogram depicting the access to nearby water sources near outdoor play spaces in Johannesburg ECD centres



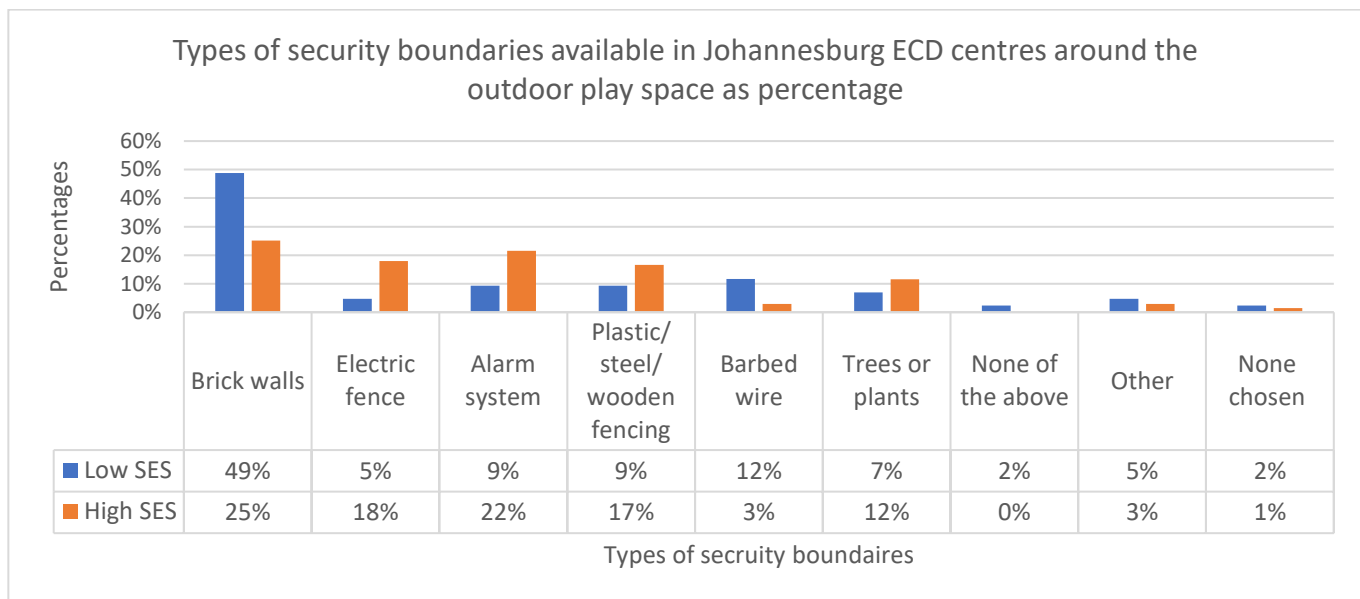
## C7 A histogram depicting the close access to a toileting facility from the outdoor play space in Johannesburg ECD centres



## C8 – A histogram depicting the access to a safe storage facility for loose parts from the outdoor play space during non-school hours in Johannesburg ECD centres



## C9 – A histogram depicting the types of security boundaries around the outdoor play spaces in Johannesburg ECD centres



## Appendix S: Results – Content Analysis for Qualitative Data in Component C

- other\_c1\_v2
  - Pebbles
  - paving
- other\_c2\_v2
  - mattresses and astro
  - Artificial turf, with rubber underneath
  - Artificial grass
  - Plastic covered mats with thick sponge inners
  - foam sponge under jungle gym
  - Soft mats
  - soft mats
  - Gym Mats
  - Foam mats
  - Fake grass
  - Astroturf
  - Astroturf
  - soft landing with foam inside plastic covered bags
- other\_c9\_v2
  - Fence
  - pallisade
  - palisade fence
  - electric fence is not working
  - Front gate, brick walls, electric fence, alarm system at front of school only

## Appendix T: Results and Data Analysis – Tabular summary of Component D (Descriptive and Inferential Statistics)

**Appendix Table 9. A table outlining a summary of the results and data analysis of component C using both descriptive and inferential statistics**

| Characteristics                                                          | Category       | Total | Low ECD (freq) | Low ECD (%) | High ECD (freq) | High ECD (%) | Chi Squared Test For Independence                                                                                                                                                                                                                                                |             | Cramer's V (Measure of association)                                                                                                                                                                                                         |    |
|--------------------------------------------------------------------------|----------------|-------|----------------|-------------|-----------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|                                                                          |                |       |                |             |                 |              | <b>H0: Socioeconomic status of ECD centre and XXX are independent.</b><br><b>H1: Socioeconomic status of ECD centre and XXX are NOT independent</b><br>Expected values: (row sum * col sum) / total sum<br>$(obs - exp)^2 / exp$<br><b>Reject H0 if <math>p &lt; 0.05</math></b> |             | Cramer's v = $\sqrt{(x^2/n) / \min(c-1, r-1)}$ where $x^2$ is the chi-squared test stat<br>It ranges from 0 to 1 where:<br>0 indicates no association between the two variables.<br>1 indicates a strong association between two variables. |    |
| <b>D1: The outdoor play space/s at the ECD centre is physically safe</b> | Strongly agree | 43    | 7              | 25%         | 36              | 67%          | <b>Chi squared test stat</b>                                                                                                                                                                                                                                                     | 21,44798876 | <b>sample size (n)</b>                                                                                                                                                                                                                      | 82 |
|                                                                          | Agree          | 25    | 11             | 39%         | 14              | 26%          | <b>Degrees of freedom</b>                                                                                                                                                                                                                                                        | 5           | <b>c-1</b>                                                                                                                                                                                                                                  | 1  |
|                                                                          | No opinion     | 1     | 1              | 4%          | 0               | 0%           | <b>p value</b>                                                                                                                                                                                                                                                                   | 0,000666437 | <b>r-1</b>                                                                                                                                                                                                                                  | 5  |
|                                                                          | Disagree       | 6     | 6              | 21%         | 0               | 0%           | <b>Result</b>                                                                                                                                                                                                                                                                    | REJECT H0   | <b>dof: min(c-1, r-1)</b>                                                                                                                                                                                                                   | 1  |

|                                                                                                    |                   |    |       |      |    |      |                                                                |                        |                                                                 |                    |
|----------------------------------------------------------------------------------------------------|-------------------|----|-------|------|----|------|----------------------------------------------------------------|------------------------|-----------------------------------------------------------------|--------------------|
|                                                                                                    | Strongly disagree | 0  | 0     | 0%   | 0  | 0%   | D1 and socioeconomic status of ECD centre are not independent. |                        | <b>Cramer's V</b>                                               | 0,51143            |
|                                                                                                    | None chosen       | 7  | 3     | 11%  | 4  | 7%   |                                                                |                        | <b>Correlation</b>                                              | strong correlation |
|                                                                                                    |                   |    | 28    | 100% | 54 | 100% |                                                                |                        | D1 and socioeconomic status of ECDs display strong correlation. |                    |
| <b>D2: The outdoor play space/s at the ECD centre is accessible and inclusive for all children</b> | Strongly agree    | 43 | 6     | 21%  | 37 | 69%  | <b>Chi squared test stat</b>                                   | 35,6460692             | <b>sample size (n)</b>                                          | 82                 |
|                                                                                                    | Agree             | 30 | 18    | 64%  | 12 | 22%  | <b>Degrees of freedom</b>                                      | 5                      | <b>c-1</b>                                                      | 1                  |
|                                                                                                    | No opinion        | 1  | 0     | 0%   | 1  | 2%   | <b>p value</b>                                                 | 0,00000111790427680567 | <b>r-1</b>                                                      | 5                  |
|                                                                                                    | Disagree          | 1  | 1     | 4%   | 0  | 0%   | <b>Result</b>                                                  | REJECT H0              | <b>dof: min(c-1,r-1)</b>                                        | 1                  |
|                                                                                                    | Strongly disagree | 0  | 0     | 0%   | 0  | 0%   | D2 and socioeconomic status of ECD centre are not independent. |                        | <b>Cramer's V</b>                                               | 0,246932           |
|                                                                                                    | None chosen       | 7  | 3     | 11%  | 4  | 7%   |                                                                |                        | <b>Correlation</b>                                              | strong correlation |
|                                                                                                    |                   |    | Check | 100% |    | 100% |                                                                |                        | D2 and socioeconomic status of ECDs display strong correlation. |                    |

|                                                                                                                                                                                                                |                   |    |       |      |    |      |                                                                |                                  |                   |                                                                 |                    |
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| D3: The outdoor play space/s at the ECD centre has a sensory environment that offers adequate invitation to the children for play (this includes opportunities to move, feel, see, hear, smell and even taste) | Strongly agree    | 38 | 5     | 18%  | 33 | 61%  | Chi squared test stat                                          | 32,28381404                      | sample size (n)   | 82                                                              |                    |
|                                                                                                                                                                                                                | Agree             | 26 | 12    | 43%  | 14 | 26%  | Degrees of freedom                                             | 5                                | c-1               | 1                                                               |                    |
|                                                                                                                                                                                                                | No opinion        | 7  | 6     | 21%  | 1  | 2%   | p value                                                        | 0,000005219<br>81861389898       | r-1               | 5                                                               |                    |
|                                                                                                                                                                                                                | Disagree          | 4  | 2     | 7%   | 2  | 4%   | Result                                                         | REJECT H0                        | dof: min(c-1,r-1) | 1                                                               |                    |
|                                                                                                                                                                                                                | Strongly disagree | 0  | 0     | 0%   | 0  | 0%   | D3 and socioeconomic status of ECD centre are not independent. |                                  |                   | Cramer's V                                                      | 0,6274<br>59       |
|                                                                                                                                                                                                                | None chosen       | 7  | 3     | 11%  | 4  | 7%   |                                                                |                                  |                   | Correlation                                                     | strong correlation |
|                                                                                                                                                                                                                |                   |    | Check | 100% |    | 100% |                                                                |                                  |                   | D3 and socioeconomic status of ECDs display strong correlation. |                    |
| D4: The amount and configuration of the outdoor space/s at the ECD cecentre supports the activities of                                                                                                         | Strongly agree    | 47 | 7     | 25%  | 40 | 74%  | Chi squared test stat                                          | 43,05837723                      | sample size (n)   | 82                                                              |                    |
|                                                                                                                                                                                                                | Agree             | 22 | 15    | 54%  | 7  | 13%  | Degrees of freedom                                             | 5                                | c-1               | 1                                                               |                    |
|                                                                                                                                                                                                                | No opinion        | 1  | 1     | 4%   | 0  | 0%   | p value                                                        | 0,000000035<br>95759508249<br>85 | r-1               | 5                                                               |                    |
|                                                                                                                                                                                                                | Disagree          | 3  | 1     | 4%   | 2  | 4%   | Result                                                         | REJECT H0                        | dof: min(c-1,r-1) | 1                                                               |                    |
|                                                                                                                                                                                                                | Strongly disagree | 1  | 1     | 4%   | 0  | 0%   |                                                                |                                  |                   | Cramer's V                                                      | 0,7246<br>39       |
|                                                                                                                                                                                                                |                   |    |       |      |    |      |                                                                |                                  |                   |                                                                 |                    |

|                                                                                                                           |                   |    |       |       |      |      |                                                                |                           |                                                                  |                              |  |
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| the player (i.e. is the size big enough and the layout appropriate ly spread out enough for the children to play happily? | None chosen       | 8  | 3     | 11%   | 5    | 9%   | D4 and socioeconomic status of ECD centre are not independent. |                           | Correla tion                                                     | strong correla tion          |  |
|                                                                                                                           |                   |    |       |       |      |      |                                                                |                           | D4 and socio economic status of ECDs display strong correlation. |                              |  |
|                                                                                                                           |                   |    | Check | 100%  |      | 100% |                                                                |                           |                                                                  |                              |  |
| D5: The outdoor play space/s is supporting all children’s rights to play and freedom to play opportuniti es               | Strongly agree    | 48 | 6     | 21%   | 42   | 78%  | Chi square d test stat                                         | 49,60452466               | sample size (n)                                                  | 82                           |  |
|                                                                                                                           | Agree             | 21 | 15    | 54%   | 6    | 11%  | Degree s of freedo m                                           | 5                         | c-1                                                              | 1                            |  |
|                                                                                                                           | No opinion        | 2  | 1     | 4%    | 1    | 2%   | p value                                                        | 0,00000000166957678621996 | r-1                                                              | 5                            |  |
|                                                                                                                           | Disagree          | 3  | 2     | 7%    | 1    | 2%   | Result                                                         | REJECT H0                 | dof: min(c-1,r-1)                                                | 1                            |  |
|                                                                                                                           | Strongly disagree | 1  | 1     | 4%    | 0    | 0%   | D5 and socioeconomic status of ECD centre are not independent. |                           | Cramer’s V                                                       | 0,777775                     |  |
|                                                                                                                           | None chosen       | 7  | 3     | 11%   | 4    | 7%   |                                                                |                           | Correla tion                                                     | strong correla tion          |  |
|                                                                                                                           |                   |    |       | Check | 100% |      |                                                                |                           | 100%                                                             | D5 and socio economic status |  |
|                                                                                                                           |                   |    |       |       |      |      |                                                                |                           |                                                                  |                              |  |

|                                                                                                                |                   |    |       |      |    |      |                                                                |                             |                                                                 |                     |
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|                                                                                                                |                   |    |       |      |    |      |                                                                |                             | of ECDs display strong correlation.                             |                     |
| <b>D6: The outdoor play space/s at the ECD centre has sufficient space for all the children to play freely</b> | Strongly agree    | 51 | 6     | 21%  | 45 | 83%  | <b>Chi square d test stat:</b>                                 | 59,8535314                  | <b>sample size (n)</b>                                          | 82                  |
|                                                                                                                | Agree             | 17 | 14    | 50%  | 3  | 6%   | <b>Degree s of freedo m</b>                                    | 5                           | <b>c-1</b>                                                      | 1                   |
|                                                                                                                | No opinion        | 1  | 1     | 4%   | 0  | 0%   | <b>p value</b>                                                 | 0,0000000000130318132975653 | <b>r-1</b>                                                      | 5                   |
|                                                                                                                | Disagree          | 5  | 3     | 11%  | 2  | 4%   | <b>Result</b>                                                  | REJECT H0                   | <b>dof: min(c-1,r-1)</b>                                        | 1                   |
|                                                                                                                | Strongly disagree | 1  | 1     | 4%   | 0  | 0%   | D6 and socioeconomic status of ECD centre are not independent. |                             | <b>Cramer's V</b>                                               | 0,854354            |
|                                                                                                                | None chosen       | 7  | 3     | 11%  | 4  | 7%   |                                                                |                             | <b>Correla tion</b>                                             | strong correla tion |
|                                                                                                                |                   |    | Check | 100% |    | 100% |                                                                |                             | D6 and socioeconomic status of ECDs display strong correlation. |                     |
|                                                                                                                |                   |    |       |      |    |      |                                                                |                             |                                                                 |                     |
| <b>D7: The outdoor play space/s, resources and</b>                                                             | Strongly agree    | 45 | 4     | 14%  | 41 | 76%  | <b>Chi square d test stat:</b>                                 | 52,75460278                 | <b>sample size (n)</b>                                          | 82                  |
|                                                                                                                | Agree             | 21 | 16    | 57%  | 5  | 9%   | <b>Degree s of</b>                                             | 5                           | <b>c-1</b>                                                      | 1                   |

|                                                                                                   |                   |    |    |       |      |      |                                                                |                            |                                                                 |                    |
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| equipment supports age-appropriate gross motor developmental milestones                           |                   |    |    |       |      |      | freedom                                                        |                            |                                                                 |                    |
|                                                                                                   | No opinion        | 4  | 2  | 7%    | 2    | 4%   | p value                                                        | 0,000000000377700929414509 | r-1                                                             | 5                  |
|                                                                                                   | Disagree          | 5  | 3  | 11%   | 2    | 4%   | Result                                                         | REJECT H0                  | dof: min(c-1,r-1)                                               | 1                  |
|                                                                                                   | Strongly disagree | 0  | 0  | 0%    | 0    | 0%   | D7 and socioeconomic status of ECD centre are not independent. |                            | Cramer's V                                                      | 0,80209            |
|                                                                                                   | None chosen       | 7  | 3  | 11%   | 4    | 7%   |                                                                |                            | Correlation                                                     | strong correlation |
|                                                                                                   |                   |    |    | Check | 100% | 100% |                                                                |                            | D7 and socioeconomic status of ECDs display strong correlation. |                    |
| D8: The natural/fabricated objects in the outdoor play space/s support the activity of the player | Strongly agree    | 39 | 1  | 4%    | 38   | 72%  | Chi square d test stat:                                        | 53,4131896                 | sample size (n)                                                 | 81                 |
|                                                                                                   | Agree             | 21 | 13 | 46%   | 8    | 15%  | Degree s of freedom                                            | 5                          | c-1                                                             | 1                  |
|                                                                                                   | No opinion        | 6  | 6  | 21%   | 0    | 0%   | p value                                                        | 0,000000000276644137564987 | r-1                                                             | 5                  |
|                                                                                                   | Disagree          | 8  | 5  | 18%   | 3    | 6%   | Result                                                         | REJECT H0                  | dof: min(c-1,r-1)                                               | 1                  |
|                                                                                                   | Strongly disagree | 0  | 0  | 0%    | 0    | 0%   |                                                                |                            | Cramer's V                                                      | 0,812048           |
|                                                                                                   |                   |    |    |       |      |      |                                                                |                            |                                                                 |                    |

|                                                                                                                                               |                   |    |       |      |    |      |                                                                |                           |                                                                 |                    |
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|                                                                                                                                               | None chosen       | 7  | 3     | 11%  | 4  | 8%   | D8 and socioeconomic status of ECD centre are not independent. |                           | <b>Correlation</b>                                              | strong correlation |
|                                                                                                                                               |                   |    |       |      |    |      |                                                                |                           | D8 and socioeconomic status of ECDs display strong correlation. |                    |
|                                                                                                                                               |                   |    | Check | 100% |    | 100% |                                                                |                           |                                                                 |                    |
| <b>D9: The play materials support the child's development of age-appropriate fine motor manipulation, construction, purpose and attention</b> | Strongly agree    | 42 | 3     | 11%  | 39 | 72%  | <b>Chi square d test stat:</b>                                 | 49,15960591               | <b>sample size (n)</b>                                          | 82                 |
|                                                                                                                                               |                   |    |       |      |    |      | <b>Degree s of freedom</b>                                     | 5                         | <b>c-1</b>                                                      | 1                  |
|                                                                                                                                               | Agree             | 28 | 18    | 64%  | 10 | 19%  | <b>p value</b>                                                 | 0,00000000205865031596119 | <b>r-1</b>                                                      | 5                  |
|                                                                                                                                               | No opinion        | 4  | 4     | 14%  | 0  | 0%   | <b>Result</b>                                                  | REJECT H0                 | <b>dof: min(c-1,r-1)</b>                                        | 1                  |
|                                                                                                                                               | Disagree          | 1  | 0     | 0%   | 1  | 2%   | D9 and socioeconomic status of ECD centre are not independent. |                           | <b>Cramer's V</b>                                               | 0,774279           |
|                                                                                                                                               | Strongly disagree | 0  | 0     | 0%   | 0  | 0%   |                                                                |                           | <b>Correlation</b>                                              | strong correlation |
|                                                                                                                                               | None chosen       | 7  | 3     | 11%  | 4  | 7%   |                                                                |                           | D9 and socioeconomic status of ECDs display strong correlation. |                    |
|                                                                                                                                               |                   |    |       |      |    |      |                                                                |                           |                                                                 |                    |
|                                                                                                                                               |                   |    | Check | 100% |    | 100% |                                                                |                           |                                                                 |                    |

|                                                                                                                                  |                   |    |    |       |      |      |                                                                 |                           |                   |                                                                  |                    |
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| D10: The outdoor play space/s is regularly checked and maintained for safety, health or security hazards to protect the children | Strongly agree    | 50 | 10 | 36%   | 40   | 74%  | Chi square d test stat:                                         | 35,56414138               | sample size (n)   | 82                                                               |                    |
|                                                                                                                                  | Agree             | 22 | 12 | 43%   | 10   | 19%  | Degree s of freedom                                             | 5                         | c-1               | 1                                                                |                    |
|                                                                                                                                  | No opinion        | 2  | 2  | 7%    | 0    | 0%   | p value                                                         | 0,0000011608543170491     | r-1               | 5                                                                |                    |
|                                                                                                                                  | Disagree          | 1  | 1  | 4%    | 0    | 0%   | Result                                                          | REJECT H0                 | dof: min(c-1,r-1) | 1                                                                |                    |
|                                                                                                                                  | Strongly disagree | 0  | 0  | 0%    | 0    | 0%   | D10 and socioeconomic status of ECD centre are not independent. |                           |                   | Cramer's V                                                       | 0,658566           |
|                                                                                                                                  | None chosen       | 7  | 3  | 11%   | 4    | 7%   |                                                                 |                           |                   | Correlation                                                      | strong correlation |
|                                                                                                                                  |                   |    |    | Check | 100% | 100% |                                                                 |                           |                   | D10 and socioeconomic status of ECDs display strong correlation. |                    |
| D11: There is sufficient storage for the safekeeping of the outdoor play space/s                                                 | Strongly agree    | 47 | 6  | 21%   | 41   | 76%  | Chi square d test stat:                                         | 47,15923385               | sample size (n)   | 82                                                               |                    |
|                                                                                                                                  | Agree             | 18 | 13 | 46%   | 5    | 9%   | Degree s of freedom                                             | 5                         | c-1               | 1                                                                |                    |
|                                                                                                                                  | No opinion        | 3  | 2  | 7%    | 1    | 2%   | p value                                                         | 0,00000000527223801697741 | r-1               | 5                                                                |                    |
|                                                                                                                                  |                   |    |    |       |      |      |                                                                 |                           |                   |                                                                  |                    |

|                                                                                                                         |                   |    |       |      |    |      |                                                                 |                           |                                                                  |                    |
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| <b>loose/<br/>moveable<br/>materials</b>                                                                                | Disagree          | 7  | 4     | 14%  | 3  | 6%   | <b>Result</b>                                                   | REJECT H0                 | <b>dof:<br/>min(c-<br/>1,r-1)</b>                                | 1                  |
|                                                                                                                         | Strongly disagree | 0  | 0     | 0%   | 0  | 0%   | D11 and socioeconomic status of ECD centre are not independent. |                           | <b>Cramer's V</b>                                                | 0,758362           |
|                                                                                                                         | None chosen       | 7  | 3     | 11%  | 4  | 7%   |                                                                 |                           | <b>Correlation</b>                                               | strong correlation |
|                                                                                                                         |                   |    |       |      |    |      |                                                                 |                           | D11 and socioeconomic status of ECDs display strong correlation. |                    |
| <b>D12: There is sufficient play time during the school day for children to play freely in the outdoor play space/s</b> |                   |    | Check | 100% |    | 100% | <b>Chi square d test stat:</b>                                  | 49,63789314               | <b>sample size (n)</b>                                           | 82                 |
|                                                                                                                         | Strongly agree    | 52 | 8     | 29%  | 44 | 81%  | <b>Degree s of freedom</b>                                      | 5                         | <b>c-1</b>                                                       | 1                  |
|                                                                                                                         | Agree             | 21 | 15    | 54%  | 6  | 11%  | <b>p value</b>                                                  | 0,00000000164354391351435 | <b>r-1</b>                                                       | 5                  |
|                                                                                                                         | No opinion        | 1  | 1     | 4%   | 0  | 0%   | <b>Result</b>                                                   | REJECT H0                 | <b>dof:<br/>min(c-<br/>1,r-1)</b>                                | 1                  |
|                                                                                                                         | Disagree          | 1  | 1     | 4%   | 0  | 0%   | D12 and socioeconomic status of ECD centre are not independent. |                           | <b>Cramer's V</b>                                                | 0,778036           |
|                                                                                                                         | Strongly disagree | 0  | 0     | 0%   | 0  | 0%   |                                                                 |                           | <b>Correlation</b>                                               | strong correlation |
|                                                                                                                         | None chosen       | 7  | 3     | 11%  | 4  | 7%   |                                                                 |                           |                                                                  |                    |

|                                                                                                                                                                                                                                                |                   |    |       |      |    |      |                                                                 |                          |                                                                  |                    |
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|                                                                                                                                                                                                                                                |                   |    | Check | 100% |    | 100% |                                                                 |                          | D12 and socioeconomic status of ECDs display strong correlation. |                    |
| <b>D13: The outdoor play space/s supports the player's participation in developmentally-appropriate type of play (i.e. does the play space support the physical, social, and emotional skills expected for the child's developmental age?)</b> | Strongly agree    | 45 | 5     | 18%  | 40 | 74%  | <b>Chi square d test stat:</b>                                  | 45,40325109              | <b>sample size (n)</b>                                           | 82                 |
|                                                                                                                                                                                                                                                | Agree             | 25 | 16    | 57%  | 9  | 17%  | <b>Degree s of freedom</b>                                      | 5                        | <b>c-1</b>                                                       | 1                  |
|                                                                                                                                                                                                                                                | No opinion        | 2  | 2     | 7%   | 0  | 0%   | <b>p value</b>                                                  | 0,0000000120123034442024 | <b>r-1</b>                                                       | 5                  |
|                                                                                                                                                                                                                                                | Disagree          | 3  | 2     | 7%   | 1  | 2%   | <b>Result</b>                                                   | REJECT H0                | <b>dof: min(c-1,r-1)</b>                                         | 1                  |
|                                                                                                                                                                                                                                                | Strongly disagree | 0  | 0     | 0%   | 0  | 0%   | D13 and socioeconomic status of ECD centre are not independent. |                          | <b>Cramer's V</b>                                                | 0,744109           |
|                                                                                                                                                                                                                                                | None chosen       | 7  | 3     | 11%  | 4  | 7%   |                                                                 |                          | <b>Correlation</b>                                               | strong correlation |
|                                                                                                                                                                                                                                                |                   |    | Check | 100% |    | 100% |                                                                 |                          | D13 and socioeconomic status of ECDs display strong correlation. |                    |
| <b>D14: The caregivers in the outdoor</b>                                                                                                                                                                                                      | Strongly agree    | 43 | 7     | 25%  | 36 | 67%  | <b>Chi square d test stat:</b>                                  | 31,83899277              | <b>sample size (n)</b>                                           | 82                 |

|                                                                                                                                          |                   |    |    |       |      |      |                                                                 |                            |                                                                  |                    |
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| play space/s promote player's activities and play opportunities and do not interfere with the player's activities and play opportunities | Agree             | 29 | 15 | 54%   | 14   | 26%  | Degree<br>s of<br>freedom                                       | 5                          | c-1                                                              | 1                  |
|                                                                                                                                          | No opinion        | 1  | 1  | 4%    | 0    | 0%   | p value                                                         | 0,000006393723286<br>90774 | r-1                                                              | 5                  |
|                                                                                                                                          | Disagree          | 1  | 1  | 4%    | 0    | 0%   | Result                                                          | REJECT H0                  | dof:<br>min(c-1,r-1)                                             | 1                  |
|                                                                                                                                          | Strongly disagree | 1  | 1  | 4%    | 0    | 0%   | D14 and socioeconomic status of ECD centre are not independent. |                            | Cramer's V                                                       | 0,6231<br>21       |
|                                                                                                                                          | None chosen       | 7  | 3  | 11%   | 4    | 7%   |                                                                 |                            | Correlation                                                      | strong correlation |
|                                                                                                                                          |                   |    |    | Check | 100% | 100% |                                                                 |                            | D14 and socioeconomic status of ECDs display strong correlation. |                    |
| D15: The caregivers in the outdoor play space/s adhere to reasonable and consistent boundaries / rules for the                           | Strongly agree    | 49 | 10 | 37%   | 39   | 72%  | Chi square<br>d test<br>stat:                                   | 31,52851795                | sample<br>size (n)                                               | 81                 |
|                                                                                                                                          | Agree             | 24 | 13 | 48%   | 11   | 20%  | Degree<br>s of<br>freedom                                       | 5                          | c-1                                                              | 1                  |
|                                                                                                                                          | No opinion        | 0  | 0  | 0%    | 0    | 0%   | p value                                                         | 0,000007365093642<br>73572 | r-1                                                              | 5                  |
|                                                                                                                                          | Disagree          | 1  | 1  | 4%    | 0    | 0%   | Result                                                          | REJECT H0                  | dof:<br>min(c-1,r-1)                                             | 1                  |
|                                                                                                                                          |                   |    |    |       |      |      |                                                                 |                            |                                                                  |                    |

|                                                                                                         |                   |    |    |       |      |      |                                                                 |                           |                                                                  |                    |
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| <b>children in the play space</b>                                                                       | Strongly disagree | 0  | 0  | 0%    | 0    | 0%   | D15 and socioeconomic status of ECD centre are not independent. |                           | <b>Cramer's V</b>                                                | 0,623892           |
|                                                                                                         | None chosen       | 7  | 3  | 11%   | 4    | 7%   |                                                                 |                           | <b>Correlation</b>                                               | strong correlation |
|                                                                                                         |                   |    |    | Check | 100% | 100% |                                                                 |                           | D15 and socioeconomic status of ECDs display strong correlation. |                    |
| <b>D16: The outdoor play space/s provides for adequate space for flow of vigorous physical activity</b> | Strongly agree    | 47 | 6  | 21%   | 41   | 76%  | <b>Chi square d test stat:</b>                                  | 47,16037459               | <b>sample size (n)</b>                                           | 82                 |
|                                                                                                         | Agree             | 23 | 16 | 57%   | 7    | 13%  | <b>Degree s of freedom</b>                                      | 5                         | <b>c-1</b>                                                       | 1                  |
|                                                                                                         | No opinion        | 0  | 0  | 0%    | 0    | 0%   | <b>p value</b>                                                  | 0,00000000526941499376194 | <b>r-1</b>                                                       | 5                  |
|                                                                                                         | Disagree          | 3  | 1  | 4%    | 2    | 4%   | <b>Result</b>                                                   | REJECT H0                 | <b>dof: min(c-1,r-1)</b>                                         | 1                  |
|                                                                                                         | Strongly disagree | 2  | 2  | 7%    | 0    | 0%   | D16 and socioeconomic status of ECD centre are not independent. |                           | <b>Cramer's V</b>                                                | 0,758371           |
|                                                                                                         | None chosen       | 7  | 3  | 11%   | 4    | 7%   |                                                                 |                           | <b>Correlation</b>                                               | strong correlation |
|                                                                                                         |                   |    |    | Check | 100% | 100% |                                                                 |                           | D16 and socioeconomic status of ECDs display                     |                    |
|                                                                                                         |                   |    |    |       |      |      |                                                                 |                           |                                                                  |                    |

|                                                                                                           |                   |    |       |      |    |      |                                                                 |                         |                                                                  |                    |
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|                                                                                                           |                   |    |       |      |    |      |                                                                 |                         | strong correlation.                                              |                    |
| <b>D17: The outdoor play space/s is regularly and routinely monitored for ensuring safety regulations</b> | Strongly agree    | 55 | 12    | 43%  | 43 | 80%  | <b>Chi square d test stat:</b>                                  | 39,33403133             | <b>sample size (n)</b>                                           | 82                 |
|                                                                                                           | Agree             | 18 | 12    | 43%  | 6  | 11%  | <b>Degree s of freedom</b>                                      | 5                       | <b>c-1</b>                                                       | 1                  |
|                                                                                                           | No opinion        | 0  | 0     | 0%   | 0  | 0%   | <b>p value</b>                                                  | 0,000000203413376272066 | <b>r-1</b>                                                       | 5                  |
|                                                                                                           | Disagree          | 2  | 1     | 4%   | 1  | 2%   | <b>Result</b>                                                   | REJECT H0               | <b>dof: min(c-1,r-1)</b>                                         | 1                  |
|                                                                                                           | Strongly disagree | 0  | 0     | 0%   | 0  | 0%   | D17 and socioeconomic status of ECD centre are not independent. |                         | <b>Cramer's V</b>                                                | 0,692592           |
|                                                                                                           | None chosen       | 7  | 3     | 11%  | 4  | 7%   |                                                                 |                         | <b>Correlation</b>                                               | strong correlation |
|                                                                                                           |                   |    |       |      |    |      |                                                                 |                         | D17 and socioeconomic status of ECDs display strong correlation. |                    |
|                                                                                                           |                   |    | Check | 100% |    | 100% |                                                                 |                         |                                                                  |                    |
| <b>D18: The outdoor play space/s allows for variety of</b>                                                | Strongly agree    | 42 | 3     | 11%  | 39 | 72%  | <b>Chi square d test stat:</b>                                  | 47,73581871             | <b>sample size (n)</b>                                           | 82                 |
|                                                                                                           | Agree             | 26 | 16    | 57%  | 10 | 19%  | <b>Degree s of</b>                                              | 5                       | <b>c-1</b>                                                       | 1                  |

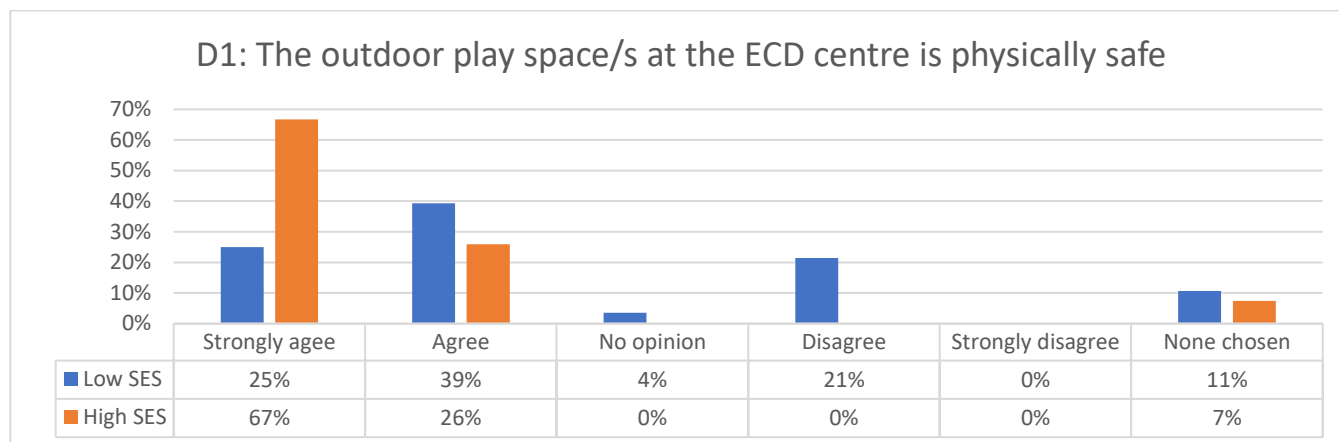
|                                                                                   |                   |    |       |      |    |      |                                                                 |                           |                                                                  |                    |
|-----------------------------------------------------------------------------------|-------------------|----|-------|------|----|------|-----------------------------------------------------------------|---------------------------|------------------------------------------------------------------|--------------------|
| play, creativity, spontaneity, continued interest and fun for all players         |                   |    |       |      |    |      | freedom                                                         |                           |                                                                  |                    |
|                                                                                   | No opinion        | 2  | 2     | 7%   | 0  | 0%   | p value                                                         | 0,00000000402143774797076 | r-1                                                              | 5                  |
|                                                                                   | Disagree          | 3  | 2     | 7%   | 1  | 2%   | Result                                                          | REJECT H0                 | dof: min(c-1,r-1)                                                | 1                  |
|                                                                                   | None chosen       | 8  | 4     | 14%  | 4  | 7%   | D18 and socioeconomic status of ECD centre are not independent. |                           | Cramer's V                                                       | 0,762984           |
|                                                                                   |                   |    | Check | 100% |    | 100% |                                                                 |                           | Correlation                                                      | strong correlation |
|                                                                                   |                   |    |       |      |    |      |                                                                 |                           | D18 and socioeconomic status of ECDs display strong correlation. |                    |
| D19: The outdoor play space/s allows for inclusivity of children of ALL abilities | Strongly agree    | 30 | 4     | 14%  | 26 | 48%  | Chi square d test stat:                                         | 23,11516021               | sample size (n)                                                  | 82                 |
|                                                                                   | Agree             | 26 | 11    | 39%  | 15 | 28%  | Degree s of freedom                                             | 5                         | c-1                                                              | 1                  |
|                                                                                   | No opinion        | 10 | 5     | 18%  | 5  | 9%   | p value                                                         | 0,000320876               | r-1                                                              | 5                  |
|                                                                                   | Disagree          | 7  | 3     | 11%  | 4  | 7%   | Result                                                          | REJECT H0                 | dof: min(c-1,r-1)                                                | 1                  |
|                                                                                   | Strongly disagree | 1  | 1     | 4%   | 0  | 0%   |                                                                 |                           | Cramer's V                                                       | 0,530935           |

|  |                |   |       |      |   |      |                                                                       |                                                                               |                           |
|--|----------------|---|-------|------|---|------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------|
|  | None<br>chosen | 8 | 4     | 14%  | 4 | 7%   | D19 and socioeconomic status<br>of ECD centre are not<br>independent. | <b>Correlat<br/>ion</b>                                                       | strong<br>correlat<br>ion |
|  |                |   | Check | 100% |   | 100% |                                                                       | D19 and socio<br>economic status<br>of ECDs display<br>strong<br>correlation. |                           |

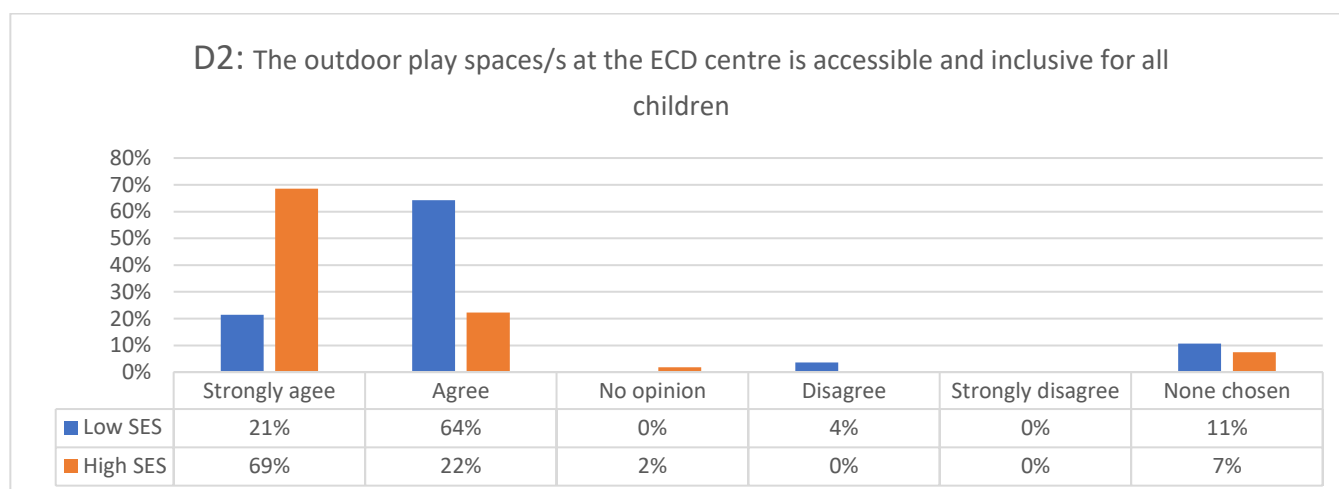
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## Appendix U: Results and Data Analysis – Visual summary of Component D

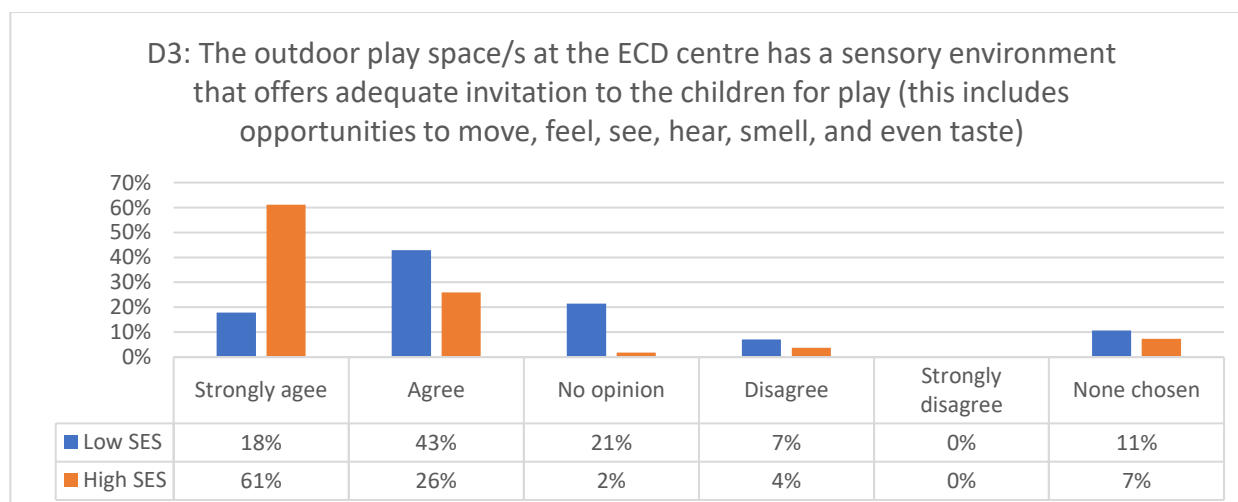
### D1 – A histogram depicting the extent to which participants agreed with the outdoor play space being physically safe



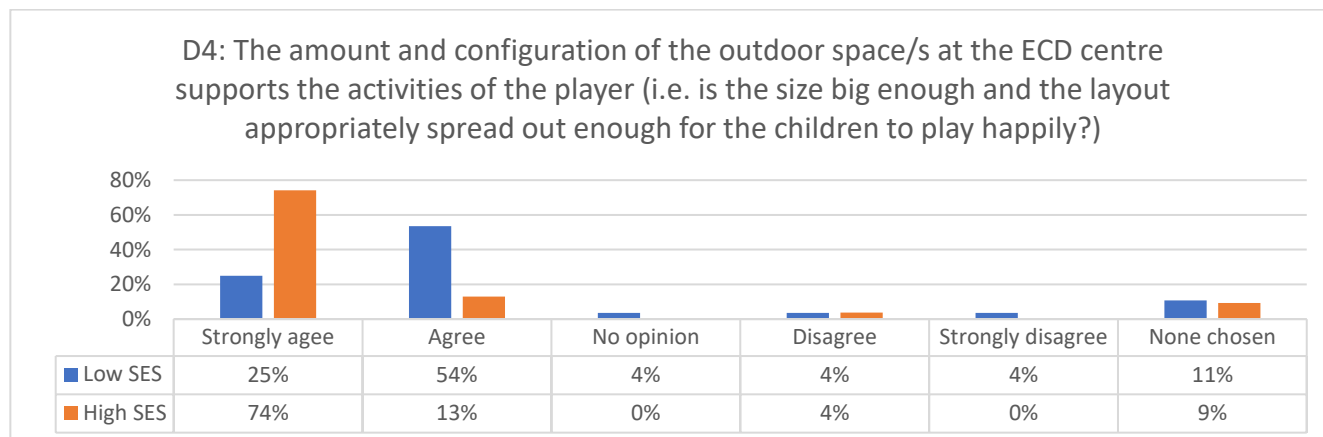
### D2 – A histogram depicting the extent to which participants agreed with the outdoor play space being accessible and inclusive for all children



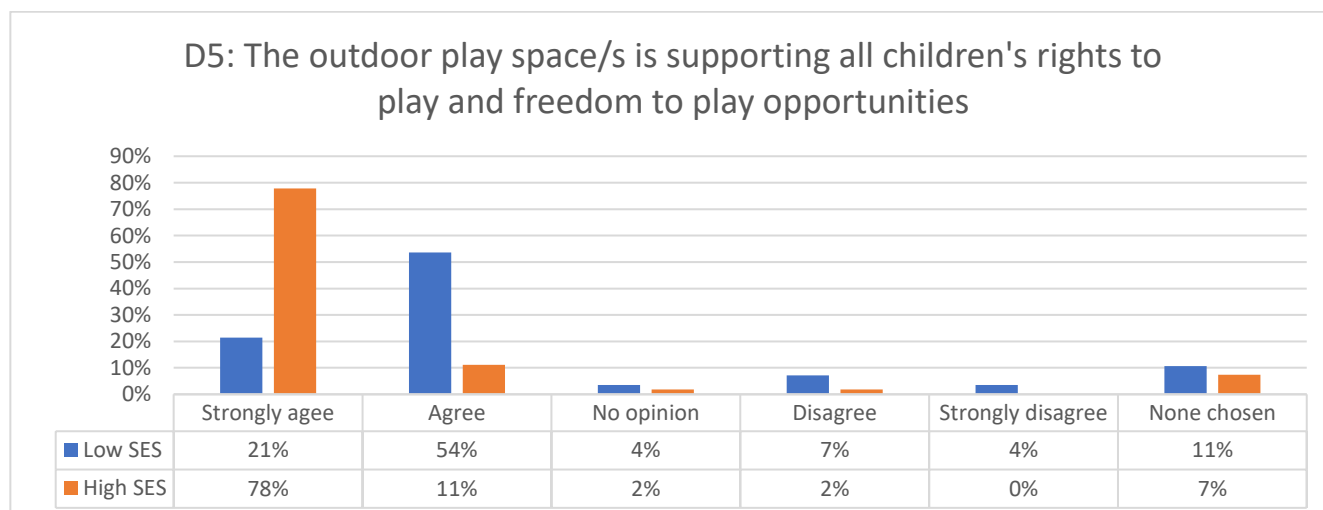
### D3 – A histogram depicting the extent to which participants agreed with the outdoor play space having a sensory environment that offers adequate invitation to the children to play



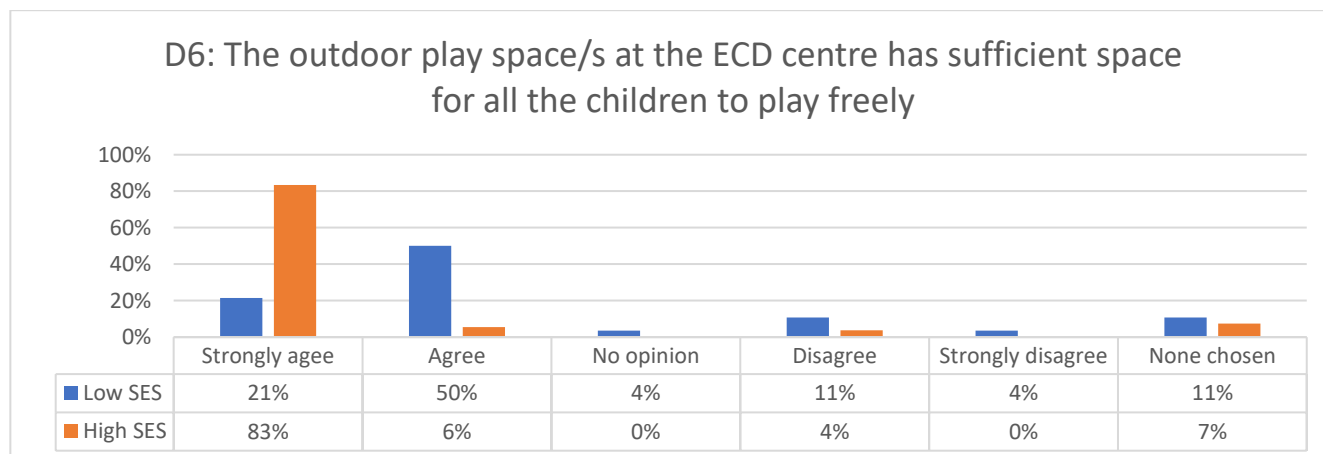
**D4 – A histogram depicting the extent to which participants agreed with the outdoor play space amount and configuration supporting the activities of the player**



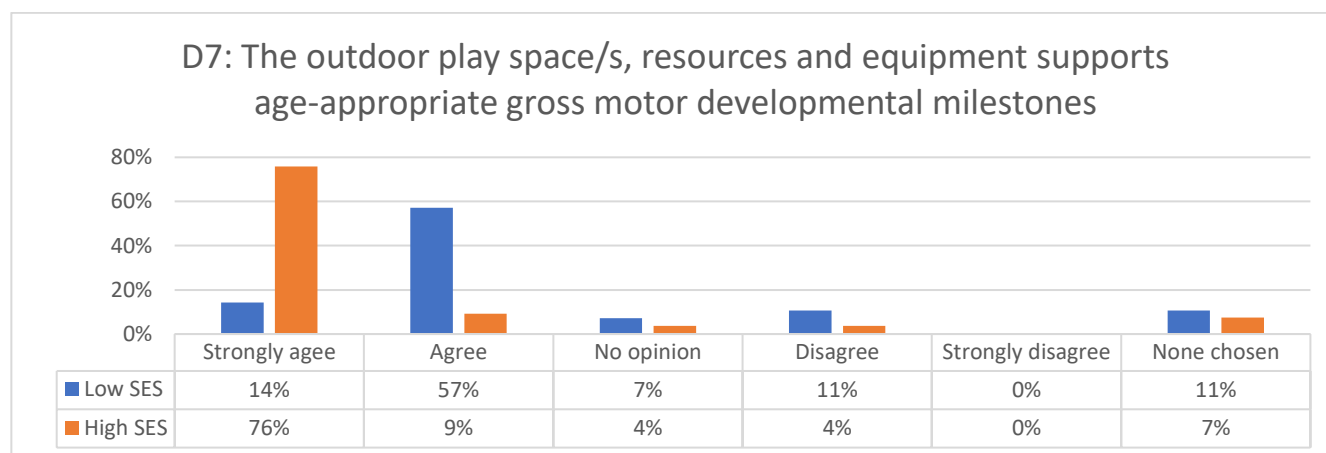
**D5- A histogram depicting the extent to which participants agreed with the outdoor play space supporting all children's rights to play and freedom to play opportunities**



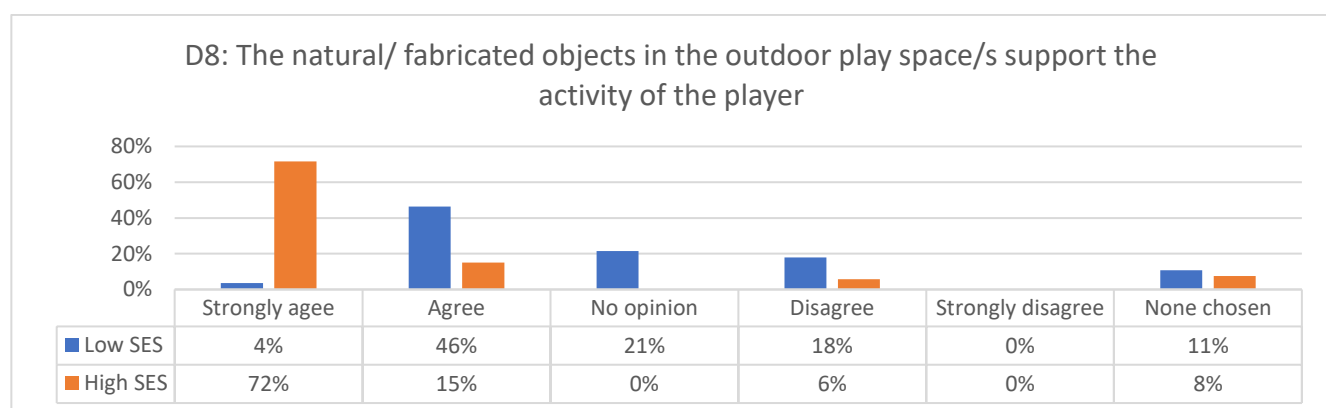
**D6 – A histogram depicting the extent to which participants agreed with the outdoor play space having sufficient space for all the children to play freely**



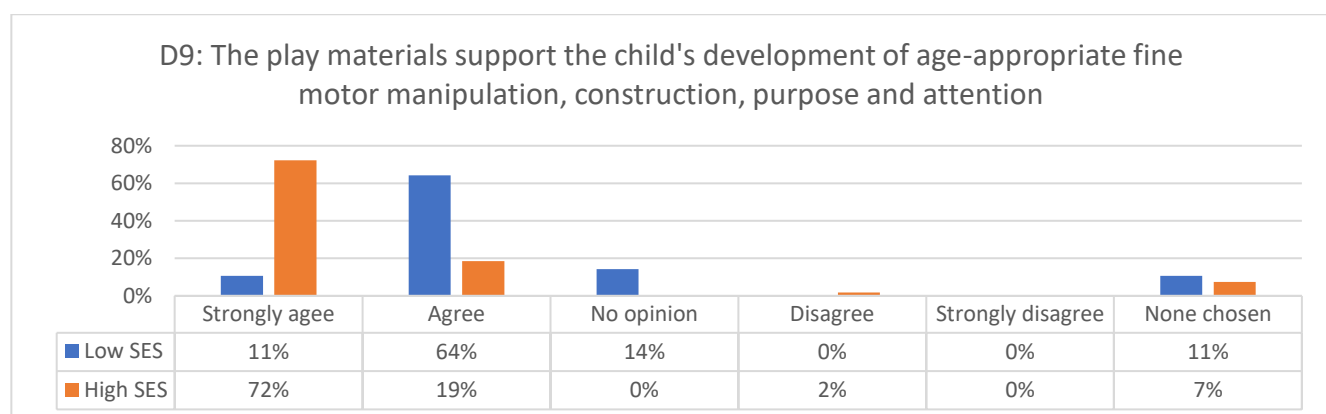
**D7 – A histogram depicting the extent to which participants agreed with the outdoor play space, resources and equipment supporting age-appropriate gross motor developmental milestones**



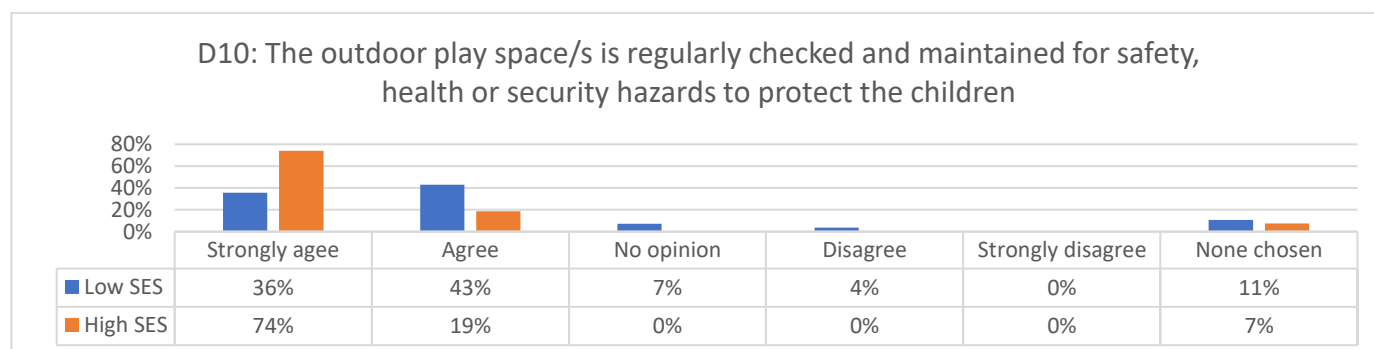
**D8 – A histogram depicting the extent to which participants agreed with the outdoor play space's natural/ fabricated objects support the activity of the player**



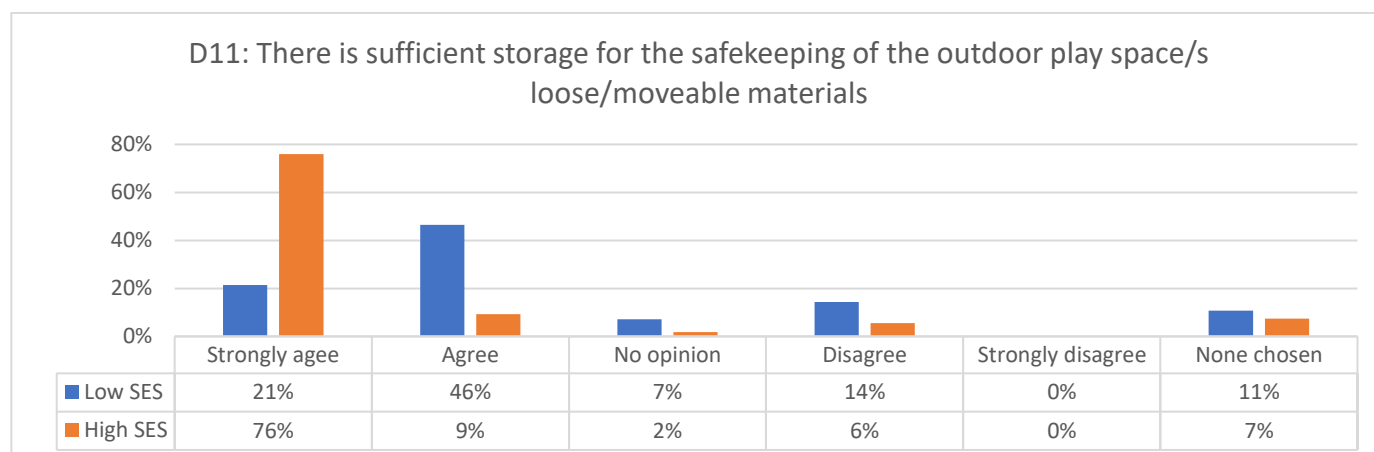
**D9 – A histogram depicting the extent to which participants agreed with the outdoor play space's play materials supporting the child's development of age-appropriate fine motor manipulation, constructions, purpose and attention**



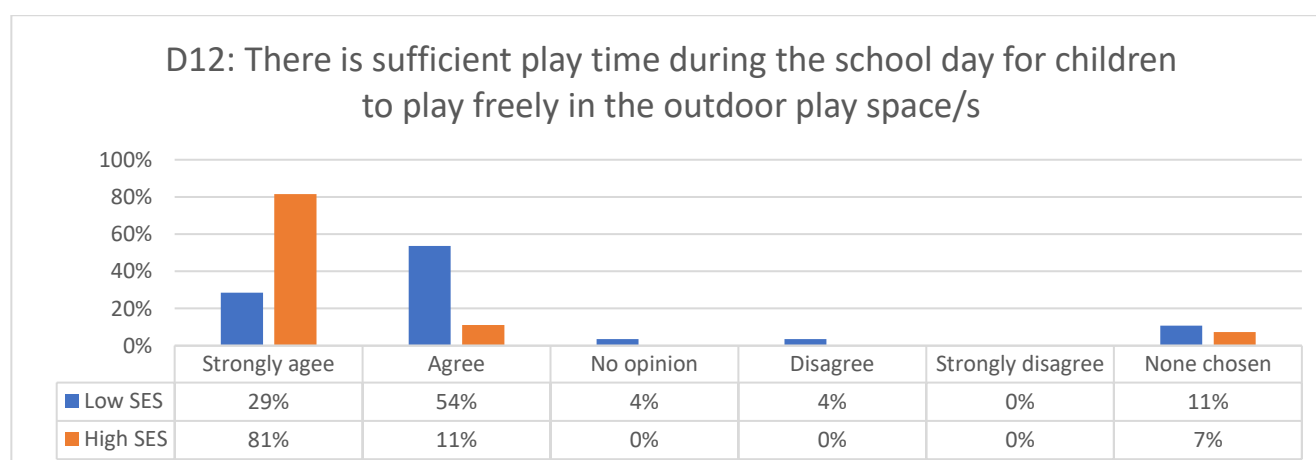
**D10 – A histogram depicting the extent to which participants agreed with the outdoor play space being regularly checked and maintained for safety, health or security hazards to protect the children**



**D11 – A histogram depicting the extent to which participants agreed with the outdoor play space having sufficient storage for the safekeeping of loose/ moveable materials**

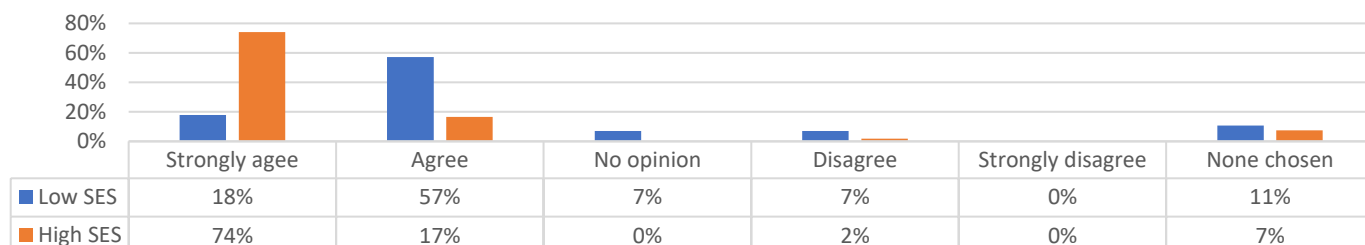


**D12 – A histogram depicting the extent to which participants agreed with there being sufficient play time during the school day for children to play freely in the outdoor play space**



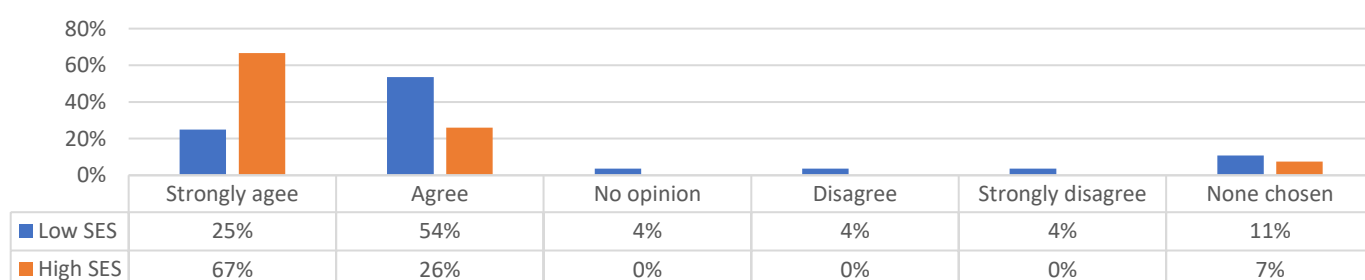
**D13 – A histogram depicting the extent to which participants agreed with the outdoor play space supporting the player's participation in developmentally-appropriate type of play**

D13: The outdoor play space/s supports the player's participation in developmentally-appropriate type of play (i.e. does that play space support the physical, social, and emotional skills expected for the child's developmental age?)



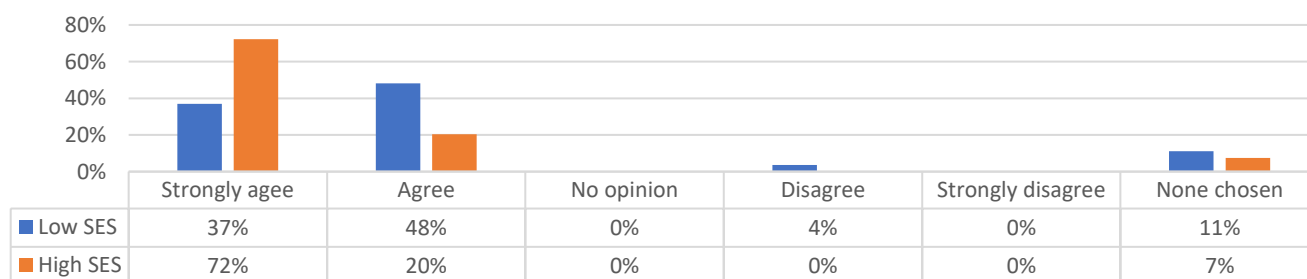
**D14 – A histogram depicting the extent to which participants agreed with the caregivers in the outdoor play space promoting player's activities and play opportunities and not interfering with the player's activities and play opportunities**

D14: The caregivers in the outdoor play space/s promote player's activities and play opportunities and do not interfere with the player's activities and play opportunities

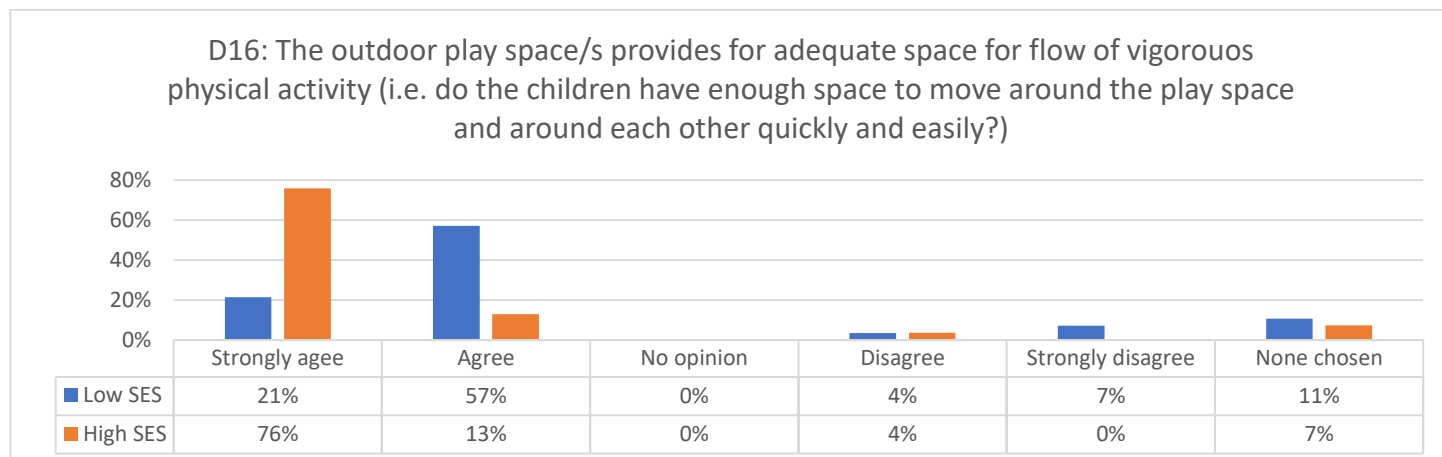


**D15 – A histogram depicting the extent to which participants agreed with the caregivers in the outdoor play space adhering to reasonable and consistent boundaries/rules for the children in the play space**

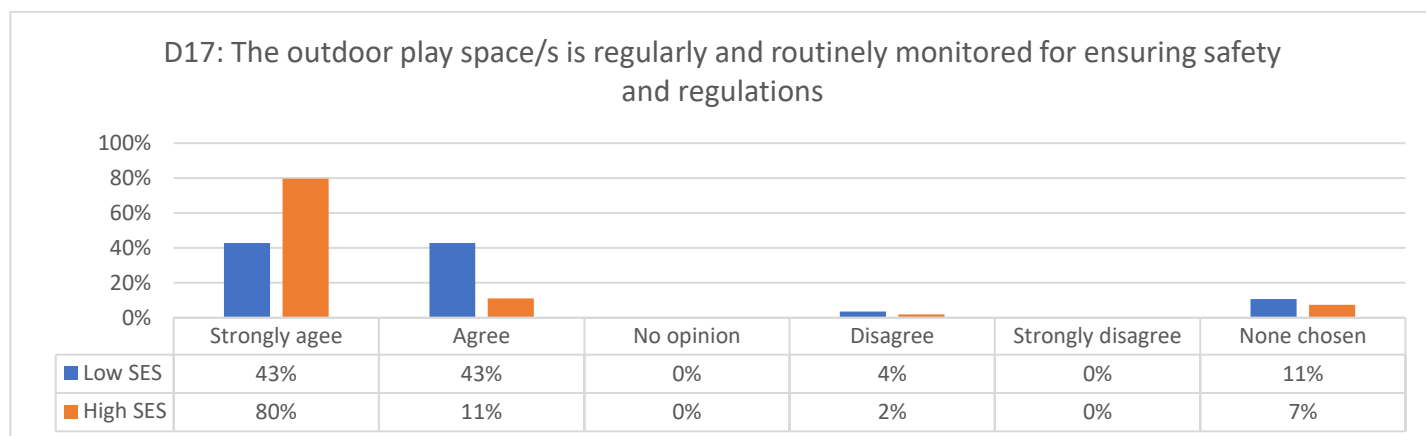
D15: The caregivers in the outdoor play space/s adhere to reasonable and consistent boundaries/ rules for the children in the play space



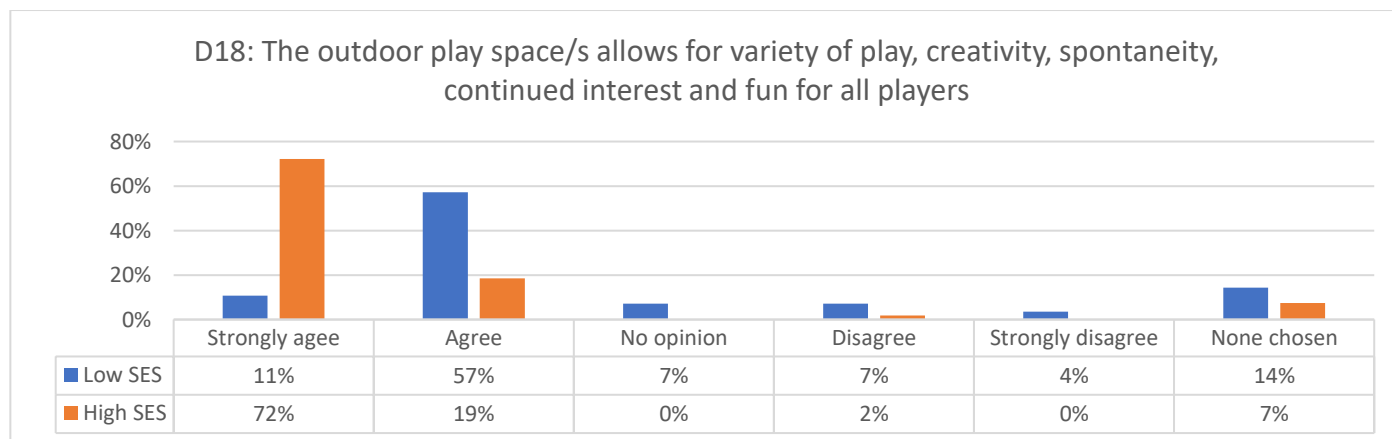
## D16 – A histogram depicting the extent to which participants agreed with the outdoor play space providing adequate space for flow of vigorous physical activity



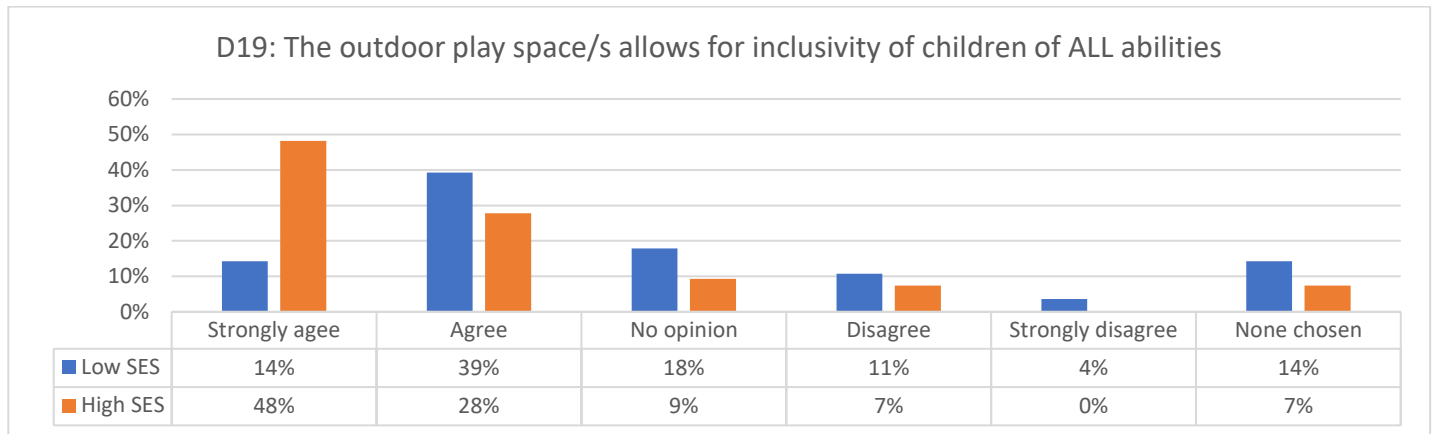
## D17 – A histogram depicting the extent to which participants agreed with the outdoor play space being regularly and routinely monitored for ensuring safety regulations



## D18 – A histogram depicting the extent to which participants agreed with the outdoor play space allowing for variety of play, creativity, spontaneity, continued interest and fun for all players



**D19 – A histogram depicting the extent to which participants agreed with the outdoor play space allowing for inclusivity of children of ALL abilities**



## Appendix V: Results and Data Analysis - Photographic evidence found in Component E

Figure: Photographic evidence of outdoor play spaces found within low socioeconomic ECD Centres in Johannesburg

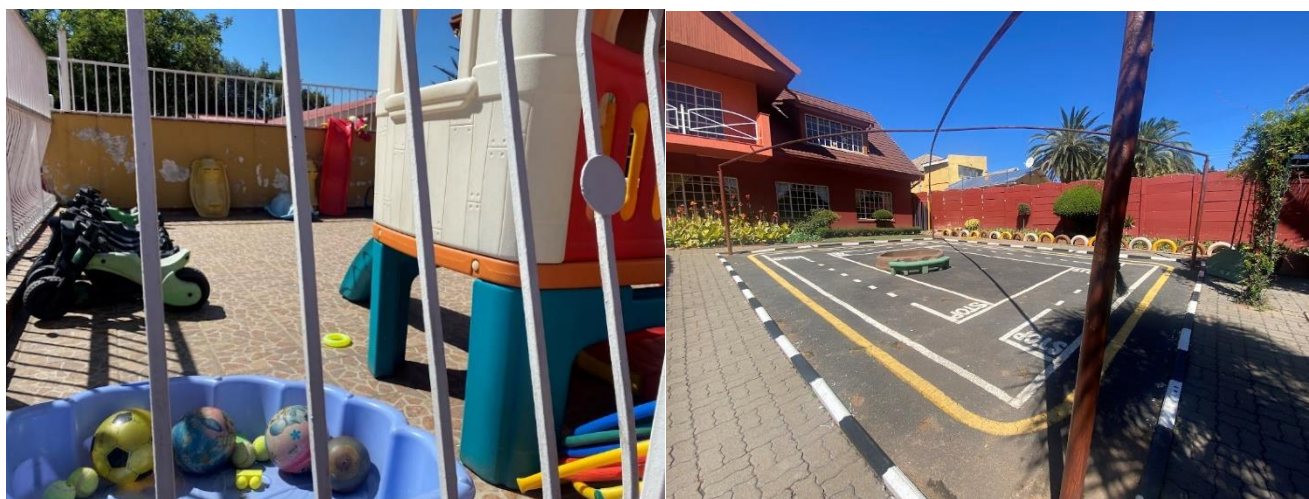




1



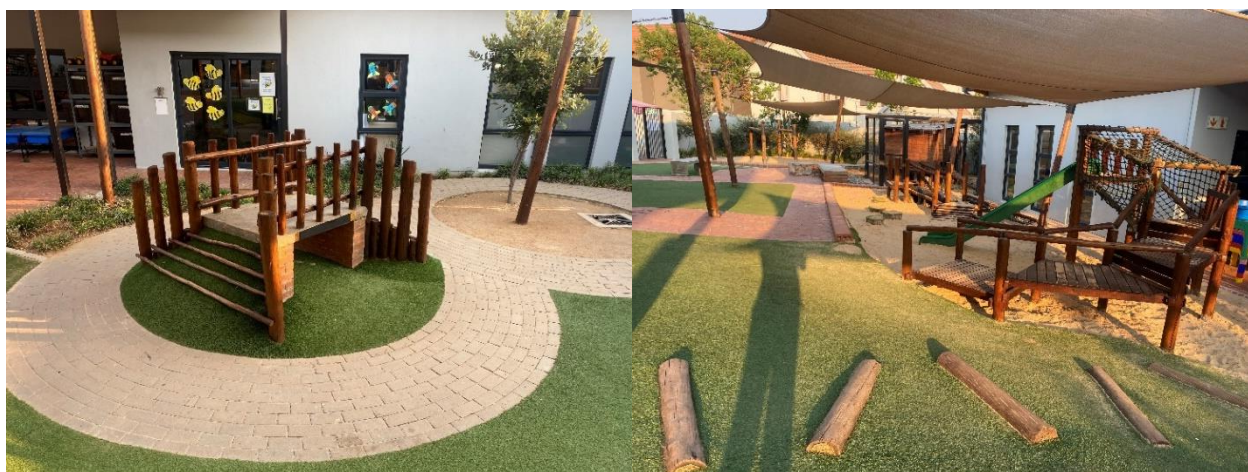
2



3



**Figure: Photographic evidence of outdoor play spaces found within high socioeconomic ECD Centres in Johannesburg**





## Appendix W: Turn-it -in Report

### Lara Final Turnitin

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SIMILARITY INDEX

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Vereschagin, Camille L.. "Outdoor Play Spaces and Hospitalized Children.", Mills College, 2019

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# Appendix X: Receipt of Re-Submission of Journal Article to the Early Childhood Education Journal (After Reviewer Revisions)

## Early Childhood Education Journal

The comparison between outdoor play spaces, equipment, and resources in low versus high socioeconomic Johannesburg early childhood development centres  
--Manuscript Draft--

|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manuscript Number:                            | ECEJ-D-24-00227R1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Full Title:                                   | The comparison between outdoor play spaces, equipment, and resources in low versus high socioeconomic Johannesburg early childhood development centres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Article Type:                                 | Original Research                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Keywords:                                     | Outdoor play space, early childhood development, socioeconomic status, physical design, equipment, resource availability.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Corresponding Author:                         | Lara Fema Clarkson, BSc in Occupational Therapy<br>University of the Witwatersrand Johannesburg<br>Johannesburg, Gauteng SOUTH AFRICA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Corresponding Author Secondary Information:   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Corresponding Author's Institution:           | University of the Witwatersrand Johannesburg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Corresponding Author's Secondary Institution: |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| First Author:                                 | Lara Fema Clarkson, BSc in Occupational Therapy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| First Author Secondary Information:           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Order of Authors:                             | Lara Fema Clarkson, BSc in Occupational Therapy<br>Marica Botha, MSc in Occupational Therapy<br>Janine van der Linde, PHD in Occupational Therapy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Order of Authors Secondary Information:       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Funding Information:                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Abstract:                                     | Play spaces facilitate play as a child's primary occupation which is essential for learning and early childhood development. In South African early childhood development centres, almost 11% do not have access to outdoor play areas, 20% have no outdoor play equipment, and 50% have no access to educational toys (Statistics South Africa, 2016). This research aimed to compare the physical design and resources of outdoor play spaces in low socioeconomic (LSE) versus high socioeconomic (HSE) early childhood development (ECD) centres in Johannesburg. A descriptive comparative research design was used, with a total population sampling method for the distribution of a self-developed questionnaire adapted from play literature. Results were obtained from a total sample size of 82 ECD centres, 28 reported LSE and 54 reported HSE. Quantitative data was analysed using descriptive and inferential statistics. LSE-ECD centres (57% community-based sites) had significantly less funding frequency compared to HSE-ECD centres (83% independent / private schools), with 87% private funding at least annually for outdoor play space upkeep. LSE-ECD centres had limited outdoor play space resource variety and quantity (7% had no outdoor play space, 43% had traditional playground designs, 14% had no fixed playground equipment), compared to HSE-ECD centres with a wide variety and abundance of outdoor play space resources. Chi-square statistics revealed a significantly higher number of fixed and loose manufactured equipment, movement toys, fixed and loose natural resources, and multi-sensory exploration spaces in HSE-ECD centres. Cramer's V statistics revealed outdoor play space physical design and resource availability have a strong dependence on socioeconomic status. |
| Response to Reviewers:                        | Thank you very much for all time, feedback and recommendations received from the ECE reviewers. I have taken into account all major revisions recommended, as well as have attached responses to these corrections as a supplementary information document with this re-submission.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| <a href="#">Action Links</a>                                                             |                                                                                   | ECEJ-D-24-00227                                                                                     | The comparison between outdoor play spaces, equipment, and resources in low versus high socioeconomic Johannesburg early childhood development centres | 28 Mar 2024                                                                                              | 28 Mar 2024                                                                                   | New Submission                                                                                     |

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| Action                                           |  | Manuscript Number  | Title                                                               | Date Submission Began  | Status Date  | Current Status  |
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| <a href="#">View Submission</a><br><a href="#">Author Response</a><br><a href="#">Correspondence</a><br><a href="#">Send E-mail</a> |                                                                                     | ECEJ-D-24-00227R1                                                                                     | The comparison between outdoor play spaces, equipment, and resources in low versus high socioeconomic Johannesburg early childhood development centres | 07 Oct 2024                                                                                               | 07 Oct 2024                                                                                     | Revision Submitted                                                                                   |

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