THE PSYCHOSOCIAL WORK ENVIRONMENT OF WOMEN CONSTRUCTION WORKERS: AN INTEGRATIVE LITERATURE REVIEW

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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 Nursing

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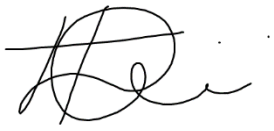
DECLARATION

I, Thato Leslie-Ann Williams declare that this research report is my own work. It is being submitted for the degree of Master of Science in Nursing at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree at any other University.



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(Signature of candidate)

11th day of November 2022 in Johannesburg

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DEDICATION

I dedicate this work to my parents, life partner and son, whom without their unwavering support none of this would have been possible.

ABSTRACT

Background: There is an increase in the number of women in the construction industry, which was considered as a masculine trade for decades. This is prone to have a bearing on the psychosocial work environment of women employed in this male dominated field of work. Women face unique challenges as opposed to their male counterparts who are employed in the same trade. These challenges include discrimination, sexual harassment, overlooked for promotions and being office bound regardless of education. These challenges can impact the psychosocial work environment of women in the workplace, which can result in them opting to exit the industry.

Aims and objectives: To gather and critically analyse scientific literature to describe the psychosocial work environment of women employees in the construction industry.

Design: An integrative literature review using the Whittemore and Knafl (2005) framework's stages was used. These stages included problem identification, literature search, data evaluation, data analysis and presentation of findings.

Methods: A comprehensive literature search was performed using Asce Library, Emerald, Science Direct electronic databases and from reference list of included articles. The studies were in English, published between January 1993 to November 2018. A total of 3764 studies were retrieved from the search. The inclusion and exclusion criteria were applied, and 57 studies were eligible for abstract reading, which yielded 7 eligible studies that were used in the study.

Results: Four themes that emerged include, less representation of women in the construction industry due to inability of retaining women.

Discussion and conclusion: Discrimination due to the benevolent sexism that women face. Stressful work environment which is amplified for women as it affects work-life balance. Labour laws, they are implemented and hardly reviewed. Women are an un-tapped resource and by eradicating these challenges by interventions the industry can be inclusive.

Key words: Construction work, psychosocial work environment and women.

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Love and light

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ACRONYMS

WHO -World Health Organization

NIOH -National Institute for Occupational Health

STATSSA- Statistics of South Africa

NAWC-National Association of Women in Construction

CIB- The Charted Institute of Building

IMF-International Monetary Fund

OHNP- Occupational Nurse Practitioner

CHAPTER ONE

ORIENTATION OF THE STUDY AND PROBLEM IDENTIFICATION

1. INTRODUCTION

The image of the construction industry is that it is only representative of brute strength, working in the outdoors in harsh weather and use of foul language. This is an image that exists for many, however, throughout the years there seems to have been a cultural shift in this industry (Agapiou, 2002). According to Ness (2012), the construction industry creates a social ideology that it is a trade that requires dirt, and it is labour intense. Ness (2012) further explains that the construction industry is known to employ males to perform the tough and hard labour. Therefore, the surge of women in this brute environment somehow helps to dispel the notion that men are somehow superior to women in strength (Ness, 2012).

Women have faced many challenges since entering the employment field, more especially in the construction industry. Eisenberg (2018) states that the surge of women in the industry started from the 1970's and 1980's, these challenges that they experienced from then are even in existence globally to this day. Women have managed to succeed in pioneering into the construction industry and have worked as carpenters, electricians, and painters (Eisenberg, 2018). Heavy lifting and other labour-intensive construction trades are a man's occupation (Ness, 2012). In domestic everyday situations, women are required to perform domestic chores which at some degree also require physical exertion, which is contradictory to the latter (Ness, 2012).

In the construction industry, work-related stress somehow appears to be an inherent occurrence, however, if not managed properly it can transcend to home life (The chartered Institute of Building [CIB], 2006; Love, Edwards & Irani, 2010). Due to how differently people handle work-related stress at an individual level it can cause or add to existing physical and mental disorders (Wang et al., 2017). The significant stressors that were identified to be prevalent in the construction industry includes work overload, role ambiguity, conflict, unpaid overtime,

restrictive career progression, travel, and diverse personalities (Sutherland & Davidson 1989; CIB, 2006; Love et al., 2010).

In an Australian study by Singh & Vinnicombe (2004), they found that women who are employed in the construction industry were underemployed, and some were working fewer hours even though they were willing to work more hours. The challenges that women face in the industry is mainly due to gender bias, which means that women are underrepresented and are under-recognised (National Association of Women in Construction [NAWC], 2013; Rosa, Hon, Bo Xia & Lamari, 2017). The construction industry is a male dominated industry with that there is preference when hiring new employees. Women face a unique challenge such as difficulty in entering the industry and if they do, inability to advance at the same rate as their male colleagues (Rosa et al., 2017). Women in the industry also face hostility and overt discrimination, done as an indication of men reasserting their dominance in the field (Clarke, Petersen, Michelsens, Susman & Wall, 2004; Ness, 2012). Women bring diversity to the workplace also in terms of productivity in the industry (Rosa et al., 2017).

As a way of accepting diversity in the construction industry, and in pursuit of accommodating women, there are some jobs that are deemed more suitable for them, these include finishing, cleaning, and design jobs in construction, this perpetuates a narration of segregation in the industry (Ness, 2012). Rosa et al. (2017) states that there seems to be little research about women employed in the construction industry. To describe the psychosocial work environment of women in the construction industry, this integrative review seeks to gather and synthesise related evidence from a global perspective.

1.1 BACKGROUND

The World Health Organization (WHO) describes the psychosocial work environment as the interaction of employees to their environment, their job selection and satisfaction, the condition of the company and staff capacity and safety (WHO, 2010:76). Stanfeld and Candy (2006) further state that the psychosocial work environment refers to characteristics that are in the workplace such as work demands and decision making that can cause a psychological response to the employee.

It is important to note that when the psychosocial factors of the workplace are not met, the consequences result in disruption in the workplace that manifests as work stress, which can impact the employee's physical wellbeing (WHO, 2010). The physical work environment refers to the safety of the work environment, exposure to hazards by use of machinery, inhalation into lungs, structural safety, and any other potential hazards (WHO, 2010). Abbe, Harvey, Ikuma & Aghazadeh (2011) states that stressors that the employee experiences in the workplace due to factors such as harassment, and discrimination can result in the presence of physical symptoms such as headaches/tension that can result in an injury occurrence in the form of occupational accidents. Factors such as dirty work environment and provision of personal protective devices that are not a good fit to women can also result in not adhering to safety protocols, further increasing risks to occurrence of injuries (Cohen, Collign, Sinclair, Newman & Schuler, 1998).

Challenges raised by women in the industry include among others that women have been earning less than their male colleagues in the same level of employment (Kamaardeen & Sunindijo, 2017). Most women reported that the construction industry culture is aggressive, confrontational, working on constant pressure, working long hours, excessive workload and an unpleasant work environment that is unhygienic and chaotic (Loosemore & Waters, 2004, Sunindijo & Kamardeen, 2017).

The challenges that women face whilst being employed in the construction industry result in few women who have admirable success in the field and thus does not inspire entry of women into the field (English & Le Jeune, 2012). Promotions in the construction industry in the case of women, is influenced by their marital status, career breaks, and whether they have young children, if they do, they are more likely to get overlooked (Arditi, Gluch & Holmdahl, 2013; Kehinde & Okoli, 2004). Women also verbalize a feeling of inadequacy in the workplace, as they are considered as being of timid nature, often they feel they are taken advantage of (Baruah, 2010; Kolade & Kehinde, 2013). Few women advance to managers or senior positions. If they do, some employees refuse or have a negative attitude towards a female leader (Toor & Ofori, 2012; Kolade & Kehinde, 2013; Morello, Issa, Asce, Franz & Asce, 2018). Furthermore, women leaders are looked down upon if they adopt the same leadership style as those of their male counterparts (Toor & Ofori, 2012; Kolade & Kehinde, 2013; Morello et al., 2018).

Coping strategies that have been used by women to survive under working in a male dominated industry is opting to act like a man, adopting the existing culture and norms, lowering work goals by opting for secondary positions and changing companies (Daity, Neale & Bagilhole, 2000). The reason that women don't progress at the same pace as men is due to the industry's intentional social isolation due to downplaying women's contribution in the industry with an intent to maintain male dominancy in the industry (Daity et al., 2000). Retaining women in the industry according to numerous studies is important for the future of the construction industry, one of the interventions by the industry should through developing a formal mentoring program (Fernando, Amaratunga & Haigh, 2014; Moore, 2006; NAWC, 2014; Rosa et al., 2017). This is intended to encourage senior employees in mentoring younger employees on their entry into the construction industry, to assist them to navigate through policies and communicate the challenges that they are experiencing (Worrall, Harris, Stewart, Thomas & McDermott, 2010).

The responsibility of the industry is that it needs to enforce a drastic change with the intent to accommodate women as they are an untapped resource and can bring an enormous impact into the industry (Morello et al., 2018). Some of the strategies that the industry can implement are the networking opportunities that can be offered to women who are employed in the industry, fair and equal promotion opportunities, fair compensation, and career satisfaction that is comparable to their male counterparts (Morello et al., 2018).

The psychosocial work environment hazards in construction and their impact on physical work hazards

As described, WHO (2010) refers to the psychological work environment as the relationship of employees related to their workplace environment, it further describes the psychosocial work environment as being the culture that the organization is founded on. These refer to daily practices such as values of the company, employees' attitude which has bearing on their mental and physical well-being of employees (WHO, 2010). A practical description of psychosocial hazards is the operational management of the organisation, the organisational structure, and if they are not well executed, they have the potential to cause psychological harm which can manifest as physical symptoms and can impact the employee negatively (Cox & Griffiths, 2005). The workplace model by WHO (2010) is used as part of the wellness management in the pursuit of assessing the psychosocial hazards in the workplace. The psychosocial hazards, also referred to as psychosocial risks, show the relationship and the impact that mental

wellbeing has on the safety and the general health of the employee (Leka & Jain, 2010). The psychological hazards influence the productivity of employees, rendering of services and the general climate of the organisation (Leka & Jain, 2010).

Psychosocial hazards in the workplace can emerge due to the presence ineffective management styles, bullying and sexual harassment, these can negatively impact the attitude of employees (WHO, 2010). Psychosocial hazards in the workplace increase as the employee experiences work-related stress. Work-related stress is a response to employees who are constantly presented with work demands that are not matched with their knowledge or their abilities, which can then result in a condition referred to as burnout (WHO, 2010). Burnout results from constant exposure to work-related stress, work-related stress is referred to as a state of physical, emotional, and mental exhaustion (Schaufeli & Greenglass, 2001). One of psychosocial hazards that are rife in the construction industry is tender/ assignment-based work, which is temporary for most employees, this increases stress for employees due to lack of job security and in most instances, there is lack of implementation of labour laws and, policies and regulations (Tedesse & Israel, 2016). Issues such as sexual harassment in the workplace that is predominantly male is prone to emerge, along with challenges such as discrimination of women. This further perpetuates the presence of work-related stress in the workplace (Collins et al., 1997; Kameerdeen & Sunindijo, 2017).

The psychosocial work environment has been used to be the predictor of absenteeism in the workplace due to likeliness of illness occurrence based on constant hazard exposure (WHO, 2010). Absenteeism records are a powerful predictor of the health status of employees (Leka et al., 2010). Psychosocial hazards are such an increased concern not only in industrialised countries, but they are a major public health concern globally (Leka et al., 2010). Control refers to ways of mitigating exposure to psychosocial hazards that results in the workplace, however, even to date there seems to be a lack of control for well-known occupational hazards in the construction industry (Leka et al., 2010). Occupational hazards that are well-known in the construction industry mainly are: work-related stress, workplace violence and harassment (Leka et al., 2010).

Workplace hazards of women in the construction industry

In terms of Section 8 of the *Occupational Health & Safety Act* 85 (1993) it is the responsibility of the employer to create a reasonably practical working environment that is safe for employees and safe from hazards. This relates to provision and servicing of machinery that is used for trade, provision of personal protective equipment to mitigate hazards, safe buildings and if there are any other known hazards, steps should be made to mitigate harm (*Occupational Health and Safety Act* 85 of 1993). Physical hazards that exist in the construction industry such as, working from heights, exposure to outdoor weather and working with machinery that cause vibrations and psychosocial hazards, such as bullying, harassment and work-related stress, can result in health concerns to the employee (Leka et al., 2010). The studies behind the hazards that are experienced by working people in the construction industry, according to Leka et al. (2010) equip employers with the understanding of health complaints that are associated with patterns of hazard exposure so as they can be prevented. In the construction industry employees are exposed to daily physical hazards, such as working from heights, long hours, utilizing of power tools, multiple contractors working at a single site, thermal stress, and work-related stress (Tedesse & Israel, 2016). The study that was conducted by Leka et al. (2010) proved that there is a relationship between physical, psychosocial hazards and over-all health. The psychological effects of physical hazards experienced by an employee can be triggered by a smell and result in psychological trauma (Leka et al., 2010).

Women in the construction industry complain of work-life balance stress due to work demands and domestic demands (Tunji-Olayeni, Afolabi, Adewale & Fagbenle, 2017). Long working hours in the construction industry come with the trade, women who have children tend to have the most trouble in balancing home and work commitments (Gurjao, 2006). Sangweni and Root (2015) stated that women who have younger children and are in the construction industry are perceived to be unreliable by their employers. Sangweni and Root (2005) further added that women employees felt that employers are apathetic to new mothers, this affects new mothers negatively when they return to work. This is a challenge that inhibits women employed in the construction industry to progress up the hierarchy in their respective companies as opposed to men (Sangweni & Root, 2015). Martin and Barnard (2013) found that the unique challenges that women face in male dominated industries are that the male industries were adamant on maintaining their gender segregated status quo, being that men are superior, and women are fragile. The attitude and culture of some employees or employers towards women in the

construction industry will not be easy to alter (Madikizela & Haupt, 2010; Sangweni & Root, 2015). Working collaboratively in creating a healthy workplace environment that is intolerable to sexual harassment, discrimination and that is actively advocating, encouraging women to progress to senior positions, will entail that more women will be encouraged to stay and some to enter the industry (Madikizela & Haupt, 2010; Sangweni & Root, 2015).

The surveillance of psychosocial risk factors is essential in the workplace, more so in the construction industry to monitor the changing work environment, and to be able to detect potential hazards with the intent of mitigating them or avoiding them altogether (Leka et al., 2010). It is essential that every institution develops its own set of policies and programmes with women employees in mind, based on existing guidelines, labour laws and regulations with the intent of promoting the mental and physical wellbeing of employees in the workplace. (Leka et al., 2010). Existing surveillance tools only assess psychosocial risks, subjective assessment of stress and health, job satisfaction and sickness absence, which is the superficial way of doing surveillance (Leka et al., 2010).

Contribution of women participation in the construction industry to the economy

Madikizela and Haupt (2010) stated that women who are employed in the South African construction industry are mostly employed as architects, contractors, engineers, manufacturers in both private and public sectors, managers, quantity surveyors and other occupations. Currently in the South African construction industry there seems to be a significant surge in the entry of women into the industry, however they still constitute a small population (SA Builder, 2019. The participation of women in the construction industry has led to economic progress in many countries International Monetary Fund (IMF, 2010). Kumar (2013) stated that the construction and building industry is the largest employer in the world.

While the National Institute for Occupational Health (NIOH) reported that the construction industry contributed to 12% of the GDP in 2016 and this accounted for about 12 500 sites with an estimated 1,463 million employees in South Africa (NIOH, 2017). According to Statistics South Africa (STATSSA) in 2018 there was 1.1% of women employed in the construction industry as compared to the year before, 2017 (STATSSA, 2018). According to SA Builder (2019) about 48% of South African construction small enterprises are owned by women that are only able to handle low value contracts. For women to be successful in the construction

industry, they must face many challenges to gain respect in the field this can result in difficulty in entering and staying in the industry (SA Builder, 2019).

Ginsburg (2013) referred to the *Constitution of the Republic of South Africa Act 108 (1996*) as the best in the word as it is inclusive to all races, gender, and religious affiliation. As defined in Chapter 2 of the *Constitution of the Republic of South Africa* Act 108 (1996), was established with the intent of eliminating discrimination regardless of race, gender, or religion. As defined in *Chapter II Employment Equity Act 55* (1998) prohibits discrimination in the workplace. The *Broad Based Black Economic Empowerment Act* 41287 *as amended* (2013) was founded in South Africa with the intent to transform the building and construction industry by creating equal opportunities for minorities and women in the construction industry (English & Jeune, 2012). All acts and regulations where these are in place to ensure that all employees in the construction and building industry are treated equally and fairly, however, as alluded from studies it is not always the same for women.

A healthy workplace environment

A healthy workplace is an environment where employees and managers work collaboratively to promote health, well-being, and safety of workers (WHO, 2010). This is executed with consideration to the health, safety, and well-being concerns of employees, whilst adhering to psychosocial work environment, organization of work, workplace culture and the physical work environment in the workplace as stipulated in the WHO workplace model (WHO, 2010). The consequences of having these hazards in the construction industry can lead to poor coping skills, which might result in use of alcohol and narcotics as a coping mechanism, elevated stress levels, increased absenteeism, and unproductivity (WHO, 2010).

The role of the employer

As defined in Section 23(1) of the *Basic Conditions of Employment Act* 75 *as amended* (1997) duties and the rights of employer are stipulated, the roles and the responsibilities are given regardless of the industry they are in. The *Basic Conditions of Employment Act* 75 *as amended* (1997) further refers to the chief executive officer (CEO) of an institution as one who is liable for making sure that they are upheld in an institution so as the employee's duties are carried out satisfactorily with provision of tool of trades. As defined on Section 8 of the *Occupational Health & Safety Act* 85 (1993) requires that the employer to maintain and bring about a

reasonable and practical working environment that is safe and does not pose as a risk to the health of the employees, should there be risks in the workplace the employer has an obligation of informing the employees, an come up with practical interventions on how they can be prevented. The Section 8 of the *Occupational Health & Safety Act* 85 (1993) further asserts that the employer has a responsibility of maintaining machinery in good condition and will not affect the health and safety of the employees. The employer proactively identifies hazards in the workplace, establish precautionary measures of identified hazards, provide information, training on what to do and not do, take precautionary measures before employees can resume with work.

1.2 PROBLEM STATEMENT

The construction industry is a perceived masculine industry as it has physical and psychosocial work hazards. This requires that there are occupational health and environment health promotion programmes, that continually teach employees on safety in the workplace. The concern however is there is always emphasis on studies about physical work hazards but not many studies on the psychosocial work hazards experienced by women in the construction industry. In a study that was carried by Curtis, Meischke, Stover, Simcox and Seixas (2018) research proves that women reported perceived stress and injury on duty to be higher as opposed to men who are employed in the same trade. Psychosocial exposures that were found to both women and men employed in construction were associated with job strain, discrimination due to age and gender, work-life balance, isolation, climate exposure and social support in the workplace (Curtis et al., 2018). Bullying, being under compensated and sexual harassment were challenges that were experienced by women (Curtis et al., 2018). Psychosocial hazards in the workplace are bullying, harassment, work-related stress and low job satisfaction are some of the hazards that affect women in the construction industry (WHO, 2010). This proves that from 2010, according to WHO to the latest study that was conducted in 2018 by Curtis et al., 2018 the same challenges that existed then are still in existence to this age. There seems to be very minimal studies that have been conducted on psychosocial hazards that women in the construction industry encounter in the workplace. There are very few coping or integrative literature reviews that were found that focused the psychosocial work environment of women in the construction industry.

The construction industry is a self-sustaining industry that has existed for decades and will continue to do so for as long as there is structural development of infrastructure, for business and people require shelter to reside in. This entails that there will always be employment within the construction industry, entering this industry equipped with skills as a professional ensures that women are indispensable and can offer valuable skills. There are patriarchal ideologies that have existed and continue to do so to this day that dictate the kind of occupations that are more fitting for women, these exclude trades that require lifting of heavy objects or working in the dirt exposed to environmental factors such as the external thermal conditions. Women are primary caregivers and with the nature of this industry the work requirements can be seasonal which entails that work assignments can be further away from home for long durations at the time, depending on the length of the project. This interferes with women being unable to perform their expected duties. This creates a stigma that is attached to collaborating with women in an already perceived male industry as it affirms that indeed it is not a trade suitable for women.

Women have unique challenges globally as opposed to men and these are perpetuated by the fact that women are primary caregivers in their families. The responsibility of tending to domestic matters and taking care of growing children rests on women. Put a woman in an industry that is considered a man's domain, this can create a hostile and unhealthy work environment for women. Women are subjected to various stressors such as harassments, being overlooked for promotion and discrimination amongst others.

A guiding question in research studies makes it possible for the researcher to be able to choose the type of inclusion and exclusions on the studies that they want to include for the research with an intent to answer the research question, this is done by properly identifying these studies (De Souza et al., 2010). Conceptual definition of variables was done with the assistance of the supervisor and co-supervisor. The PICOT acronym is useful in summarising of the research question and to ensure that the research question is focused. The (P) represents the population on interest, which in this case is women who are employed in the construction/ building industry. (I) stands for the intervention or the issue of interest, this is the psychosocial well-being of women in the workplace, (C) stands for the comparison to the intervention which in this instance can be argued. In this literature review there is no comparison rather it is to gather evidence on the psychosocial challenges women who are employed in the construction industry experience. (O) stands for outcome of interest, this is the influence that the psychosocial work

environment has on women employed in the construction industry, finally (T) is time of the publications that are to be used for this study which are between Jan 1993- Nov 2019. From all this the research question was formulated as:

The following research question guided the review:
What evidence is available in literature regarding the psychosocial work environment of women employed in the construction industry?

1.3 SIGNIFICANCE OF THE STUDY

It was envisaged that the findings of this study may contribute to the development of programs and policies that can be implemented to make the construction industry more accommodating to women regarding their psychosocial well-being. These would possibly increase an attraction for more women to this industry and increase the retention of healthy women employees. The psychosocial hazards form part of the key factors as it's in the healthy workplace model. Occupational health nurse practitioners are continually involved in making sure that the comprehensive well-being of the employee's health is maintained in the workplace. This research may add to the body of knowledge that is limited especially in the African context and could assist occupational health nurse practitioners (OHNPs) with evidence-based nursing.

1.4 PURPOSE OF THE STUDY

The purpose of the integrative review was to gather and critically analyse scientific literature to describe the psychosocial work environment of women employees in the construction industry.

1.5 OBJECTIVE OF THE STUDY

The objective was to:
Describe the psychosocial work environment of women in the construction industry from existing literature globally.

1.6 DEFINITION OF KEY VARIABLES

Definitions of the key variables used in the study are as follows:

1.6.1 Construction industry

It is a service industry of any work that has to do with fixing, upkeeping, utilizing of advanced machinery, using electrical, mechanical, and other services in the construction industry the *Occupational Health & Safety Act* 85 (1993). In this study, it will mean work that has to do with fixing, upkeeping, utilizing of advanced machinery, using electrical, mechanical, and other services in the construction industry, the synonym for construction industry is building industry, which was used synonymously in this study.

1.6.2 Psychosocial work environment

According to WHO (2010:85) the *psychosocial work environment refers to the organisation structure of the institution, organization of work, the culture in the company and the attitudes and belief that are elicited daily by the employees*. The psychosocial environment has bearing on the physical and mental well-being of the employees (WHO, 2010). In this study psychosocial work environment entails the mental, emotional, social, and physical wellbeing of women in the workplace.

1.6.3 Healthy workplace

A healthy workplace is a place where everyone works together to achieve an agreed vision for the health and wellbeing of workers and the surrounding community. (WHO, 2010:15). It provides all employees with social, physical, psychological, and organizational conditions that are intended to protect them from exposure to harm (WHO, 2010). This is important as it can foster a relationship between managers and employees to gain control of their health in the workplace and improve it to create a collaborative working relationship (WHO, 2010). This study will be based on the existing literature on the psychosocial work environment of women in the construction industry, this will shed light on whether it is a healthy industry for all.

1.7 RESEARCH METHODOLOGY

The study followed an integrated literature review which is a non-experimental design. It consists of a computer systemic search that consists of the integrative processes which include identification of the problem that is of concern to the researcher, the literature search and data collection, evaluation of the data that was collected and finally the data and the findings along with the presentation of the results (Whittemore & Knafl, 2005). Data analysis was done using thematic analysis, which has five stages. In order to ensure validity and rigour of the data that was collected word missing consists of; data reduction, data display, data comparison, conclusion drawing and verification and interpretation and presentation (De Souza, Da Silva & de Carvalho, 2010).

An integrative literature review is the widest form of a research design as it includes both the qualitative, quantitative, and mixed methods at the same time to get a broader understanding of the topic under study. It includes both empirical and theoretical literature (Kpodo, 2015; Sparbel & Anderson, 2000; Russell, 2005; Torraco, 2005; Whittemore & Knafl, 2005). The integrative review method is the only approach that allows for the combination of various methodologies to understand a phenomenon and has the potential maximize research findings (Whittemore & Knafl, 2005) more fully. This is the reason the researcher chose integrative literature review to gain understanding of the psychosocial work environment of women in the construction industry.

The research design refers to the outline that is set in place to control or impede on the flow of the results (Burns & Grove, 2009). Burns and Grove (2009) further explain that the research method in turn is the algorithm that the researcher follows when they conduct research. The integrative literature review was selected as best suited method to guide the process of this study as it will mitigate any potential bias from arising. Whittemore and Knafl (2005) stated that this type of a method is necessary in giving the researcher a comprehensive view of the study from varied studies on the topic. There are 5 stages in research methodology that the researcher had to complete in the integrative review process, rigour needed to be adhered to in each stage of the framework (Russel, 2005; Whittemore & Knafl,2005) as depicted in Figure 1.1.

1.7.1 Ethical Considerations

(i) The research proposal was peer reviewed for research report input from the Department of Nursing Education, School of Therapeutic Sciences, Faculty of Health Sciences at the University of Witwatersrand.

(ii) Approval was obtained from the Faculty of Health Sciences Postgraduate Research committee, University of Witwatersrand.

(iii) Ethical clearance waiver with reference number was obtained from the University of Witwatersrand Human Research Ethics Committee

(iv) Permission was acquired from John Hopkins Nursing Evidence-based Practice Model and tools.

(v) An experienced co-reviewer was used to maintain rigor and ensure high quality.

(vi) All articles used were handled with respect and integrity and all copyright issues, referencing was observed.

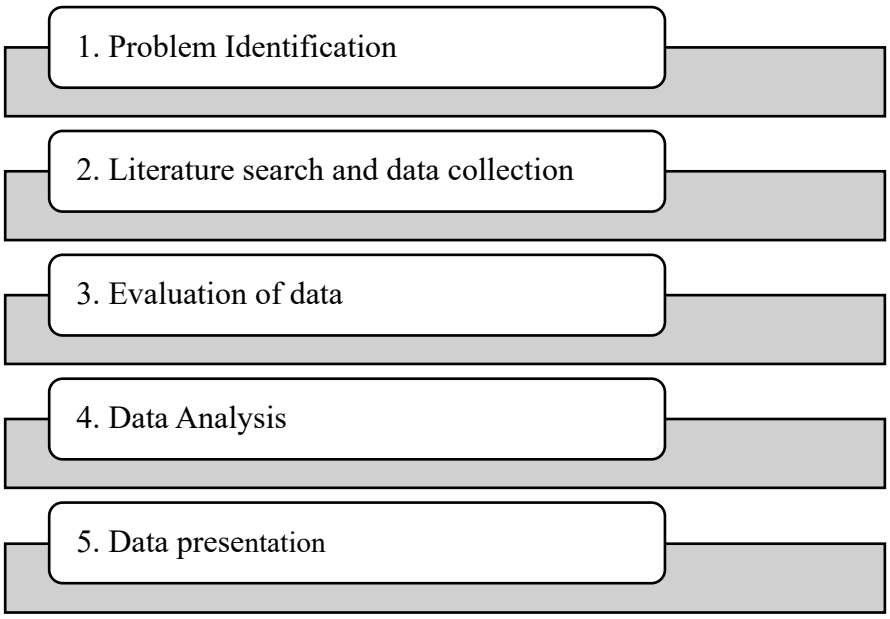

Figure 1.1 The five stages of integrative literature review (Whittemore and Knafl, 2005).

The stages depicted in Figure 1.1 are described and applied in detail in chapter 2-5.

1.8 LAYOUT OF THE STUDY

The research report is organised into five chapters. The current chapter provides the background and the aim of the study, the formulation and identification of the research

problem. This is followed by a brief overview of the research methodology as used in the integrative review, which gives a clear orientation of the study.

In Chapter two, a detailed literature search stage is outlined as it was used in the study. Detailed in this chapter are processes of identification of the problem, search method, eligibility criteria, databases, the search strategy, and process, followed by a detailed description of the selection process and documentation. Finally, a discussion of the methodological strategies employed that contributed to the rigour of the integrative review is provided.

Chapter three focuses on the collection of the data, which includes the data extraction and quality appraisal process. The chapter begins with the data extraction procedure that is in the data matrix, followed by the quality appraisal.

Chapter four presents the results of the integrative review, the study characteristics as retrieved in the review process and finally data analysis and ends with the methodological strategies that contributed to the rigour of the review at the data evaluation and data analysis stage with measures taken to ensure the rigour of the study.

Finally, Chapter five presents the discussion of the results, summary of findings and conclusion. In this chapter, findings synthesised from the integrative literature review are compared to research literature, current policy, and guidelines. The strengths and potential limitations related to the review are then provided. Finally, recommendations for future nursing research, policy, training, and practice are presented.

1.9 SUMMARY

The chapter presented the orientation of the study, the background of the study, problem statement, the aim and objective of the research, significance of the study, an overview of the research methodology, the type of method that this study will follow which is a literature review method and the rigour that needs to be adhered to deem this study credible. The next chapter discusses the literature search process as highlighted in the literature review process.

CHAPTER TWO

THE LITERATURE SEARCH

2.1 INTRODUCTION

In this chapter, the researcher presented the literature search process, the search methods such as the eligibility criteria, the databases, the search strategy, and process used, followed by a detailed description of the article selection process and the methodological rigour in each stage of the review.

2.2 INTEGRATIVE LITERATURE REVIEW METHOD

An integrative literature review by research design is non-experimental, it allows for inclusion of studies that are of various design that answer the research question or specific hypothesis for the researcher can reach a conclusion (Beyea & Nicoll, 1998; Russel, 2005; Whittemore & Knafl, 2005). The approach of this review assists in the presentation of theoretical or empirical studies to better understand a particular area of interest (Beyea & Nicoll, 1998; Russel, 2005; Whittemore & Knafl, 2005).

The integrative literature review is termed to be the most broad and comprehensive methodological approach in all the reviews as it reviews, integrates, analyses, and synthesises studies that are already published to maintain and enhance the area of research and that can subsequently bring about an emergence of a new study (De Souza et al., 2010; Torraco, 2005; Whittemore & Knafl, 2005). It is often also used to critically appraise quality of scientific studies to identify gaps for further research (Russell, 2005; Torraco, 2005; Whittemore & Knafl, 2005).

In this study, the researcher sought to gather the evidence on the psychosocial work environment of women in the construction industry. An integrative literature review as a research method was used because it allows several diverse studies to be used to answer the research question.

2.3 THE LITERATURE SEARCH METHOD

The literature search is an explanation of the process to identification of studies that are in line with the inclusion criteria, and this is the first step that is usually taken in a systemic literature review (Littlewood & Klaukos, 2019). This process does not merely include the search of the articles on the internet, databases must be identified, the formulation of research questions, applying the strategic interventions to the search process and this must be all done by maintaining rigour and by avoiding bias in the selection process (Littlewood & Klaukos, 2019). Prior to the beginning of the literature search it was essential that the researcher consulted an expert in the research field, librarian, or an information specialist prior they engaged in the literature search (Littlewood & Klaukos, 2019). In this study the researcher collaborated closely with the librarian at The University of Witwatersrand.

A comprehensive literature search uses many search strategies that are done in a concise scientific way to maximise the number of eligible studies that are attained (De Souza et al., 2010). A precise sample was used, a broad literature search was done by using specific electronic databases, ancestry search and references from eligible articles (Beyea & Nicoll, 1998; Jadad et al., 1998; Conn et al., 2003; De Souza et al., 2010). In this study the researcher utilised most of the strategies to broaden the search of the eligible data. It is essential that the researcher was able to identify their target population and have access to the population to be able to conduct the study (Russell, 2005). In this literature review, the target population were published studies that focused on psychosocial work environment of women in the construction industry, the accessible population in this instance were studies that the researcher obtained after a complete literature search using the keywords and the eligibility criteria from the selected databases.

Considering this research method chosen, the integrative literature review, the researcher was permitted to utilise various studies that differ in methodologies to be able to answer the research question. Specific databases, namely Asce Library, Emerald and Science Direct were used to describe the psychosocial work environment of women employees in the construction industry.

2.3.1 Eligibility criteria

According to De Souza et al. (2010) in the process of formulating the criteria for the literature search, the criteria must agree with the research question this is done by taking into consideration the population, the interventions, and the desired results. The sampling of literature must adhere to a specific criterion, it must represent the sample of interest as this will entail reliability along with transparency of the results (De Souza et al., 2010). In this literature review the researcher considered the focus of the study, which included the psychosocial work environment of women in the construction industry. The process for literature search done is summarised in Table 2.1

Table 2.1 Integrative review process and application on the study (Whittemore & Knafl, 2005)

PROCESS	RATIONALE	APPLICATION ON THE STUDY
Problem identification	To identify the area of interest.	To answer the research question "*What evidence is available in literature regarding the psychosocial work environment of women employed in the construction industry?*
Literature search	Identification of the databases along with the existing research on the area on interest to answer the research question and the articles that have 50% of women/female participants.	Conducting an ancestry search on Google Scholar to identify the databases that were found to be Asce Library, Emerald, Science Direct and reference list of attained studies. The studies must include at least two of the three keywords used.
Data Evaluation	To determine the authenticity of the research process and if rigour and non-bias to articles was adhered to by critically appraising the included research using a methodology evaluation tool.	Critically appraise included studies by evaluating and ranking according to the evidence ranking scale in using the John Hopkins Evidence level and quality guide Tool (2017).
Data Analysis	Provide an unbiased interpretation of the findings through synthesis and analysing the findings.	The data was presented by following the process of validation, findings on included studies were displayed in a Data Matrix, themes and sub-themes were extracted.
Presentation of findings	Conclusion drawing based on the findings and the realization or proving of the research question.	The report was given in the final chapter showing the evidence supported with additional literature to support the themes and sub-themes gathered to answer the research question, thus drawing the conclusion.

2.4 PROBLEM IDENTIFICATION

Prior to initiating the literature search, the researcher identifies the problem to highlight the purpose of the study (Whittemore & Knafl, 2005). To be able to identify the research problem, it equates to observing what happens in one's surroundings, your perception of it, enforcing your perception by scientific literature, and results that support or contradict your initial idea (Whittemore & Knafl, 2005). It is important that the operational definitions and conceptual be identified, if they are too limited, they can lower the quality of the findings thus leading to the error of results (Cooper, 1988; Russel, 2005). The interventions stipulated by Cooper (1988) and Russel (2005) were applied by the researcher by finding an area of interest thus being able to find the gap in the construction industry based on the field they have experience in. The population was identified and was able to find the sample of interest; this was all done in a scientific process to answer the research question. The topic thus was *The Psychosocial work environment of women construction workers: An Integrative review.* As part of the problem identification literature search was conducted to identify existing scientific academic literature conducted in South Africa, however there was a dearth on the literature on the topic therefore the scope was made to cover global literature.

2.4.1 Research question

The research question of this study emerged from a problem that was observed by the researcher in the construction industry which is deemed a male dominated field. Therefore, the research question was:
What evidence is available in literature regarding the psychosocial work environment of women employed in the construction industry?

2.5 LITERATURE SEARCH

The second stage of integrative literature review is the literature search and data collection. Literature search is a second phases is an important stage in a research review study. It is a structured way of looking for existing data that is published so as it can be utilised to reference, this is done in a systemic manner to answer a topic of interest (Raul, 2004). It is essential that a comprehensive literature search be conducted as it utilises many strategies for searching relevant literature for the study. This includes the sampling of diverse literature using electronic databases, ancestry searching, reading through sources of attained literature, and going through

unpublished academic literature (Conn et al., 2003; De Souza et al., 2010). It was important that the researcher conducted an extensive literature search and data collection and maintained the validity of the search. It was also important that the data collection method was explained, study sources, year of publication, keywords used along with included sources along with the criteria used to select studies (Russell, 2005). These were achieved using the identified databases (Asce library, Emerald, Science Direct) and a combination of the keywords, articles were scanned based on their:

(i) Title
(ii) Abstract for relevance to this study
(iii) Based on the inclusion criteria
(iv) All selected articles were saved on Mendeley and read to ensure relevancy and for audit trail.
(v) For data extraction, a data matrix which was designed to extract from the article the (a) author and year, (b) the evidence types, (c) sample and setting, (d) findings and (e) limitation as well as (f) level of evidence.
(vi) The John Hopkins Evidence-Based Tool Kit, which consists of the John Hopkins Evidence and Quality guide was used to rate the level of evidence and quality and finally the John Hopkins Nursing Evidence- Based Practice Appraisal Tool was used to appraise included studies (Dang & Dearholt, 2017)

2.5.1 The eligibility of the articles

According to De Souza et al. (2010) the criteria for choosing the eligibility of the existing literature must answer the research question and the chosen sample research must show full representation of the sample of interest, this helps in improving the rigour of the results. In this review the researcher took into consideration that studies that are chosen, must be representative of women who are employed in the construction industry or building industry. The construction/ building industry is underrepresented by women however to deem findings accurate, women participants on the published studies must be 50% representation of women. Due to the small number of articles that were available on the topic it was recommend by the research experts in the assessors Committee at the School of Therapeutic Sciences, Department of nursing education, pharmacy, occupational therapy, and pharmacy suggested for the

researcher to conduct a random search and assess when did women according to literature start being employed in the construction industry. The findings yielded 1993 is the year that the researcher could trace the studies. Therefore, the studies eligible were those published from 1993 and had 50% of female participants.

2.5.2 The population and sample

The study population were scholarly publication articles published between January 1993 to November 2019 that includes at least 50% of women /female participants.

2.5.3 Inclusion criteria

(i) Studies met at least two of the three of the search terms *psychosocial OR mental-wellbeing women OR female construction industry* OR *building industry* OR *construction work*
(ii) Published between January 1993 to November 2019
(iii) Only articles published in English were the only ones considered
(iv) Primary and secondary articles published in Asce library, Emerald, Science Direct
(v) An ancestry search of included articles reference lists was done.

All articles that did not meet the inclusion criteria were excluded from the literature review, as depicted in Table 2.1

Table 2.2 Eligibility criteria of the studies

CRITERIA	INCLUSION	EXCLUSION
The type of studies and the study designs of the study	All empirical, qualitative, quantitative, and mixed method academic articles that are published or unpublished.	Literature reviews, systemic reviews, textbook reviews, articles where academic principles were not followed.
Keywords	Women/ Female employees Psychosocial/mental wellbeing Construction work/Construction industry/Building industry	

Area of interest	The psychosocial work environment of women working in the construction / building industry	
Setting	Women who are employed in the construction industry	Other male dominated fields, psychosocial wellbeing of women in other trades.
Language	English	Other languages
Year of publication	Jan 1993- Nov 2019	Articles published before 1993

2.6 THE SEARCH STRATEGY

It was important that the search process was controlled to maintain rigour and to mitigate any errors in the integrative review, this was done by conducting a comprehensive search on the identified databases (Whittemore & Knafl, 2005). In this literature review articles that were retrieved were published between January 1993 to November 2019. The databases were identified by using a random search on Google Scholar after failing to attain the articles on the most common sites for construction/ building, the databases identified to have the central theme as construction were identified to be, Asce Library, Emerald, Science Direct databases. The other ways of collecting studies were done reading the reference list of the attained studies to attain studies that answer the research question. This was done through library services in the University of Witwatersrand with an assistance of a librarian, the type of articles attained were qualitative, quantitative, and mixed methods.

2.6.1 Databases

The internet search for sources made the process of compiling the literature and bibliography simpler, however the researcher needed to conduct exact precision and care in the search process as opposed to just conducting a general search (Davis, Davis & Dunagan, 2012). It is important that the researcher approached this intended process with a well-organized plan to help in saving energy and time (Davis et al., 2012). The databases identified were Asce Library, Emerald, and Science direct. Asce Library is a database that mainly deals with Engineering

publications which was helpful in attaining the studies it has an estimation of over 5000 eBooks and 10000 other publications.

The researcher was strategic in their search by having a limitation on the publication date and attaining articles that they could access to trough the inner-library loan system. This was done by entering the keywords and choosing articles that contained at-least two of the three keywords. Emerald is also the second data base that was identified, this database has an estimation 2500 eBooks and over 20000 other publications the search was used using an advanced search the publication limitations was applied and only accessing "Content I have access to". Science Direct was a robust data base to work with as it contains a rough estimation of 1000 000 eBooks and other publications on multiple research articles, subject areas, and publication sites. The researcher had to be strategic in the application of the advanced search in this database as the search needed to be concise to attain articles that can answer the research question.

2.6.2 Search terms and search strings

The study focused on the psychosocial work environment of women in the construction industry, thus it was imperative that the keywords be in line with what the research is about to answer the research question by attaining the articles on the data bases. As depicted in Figure 2.1. Synonyms had to be used as various databases use a different name for the same term for example women OR Female AND Psychosocial OR mental-wellbeing AND construction work OR Construction industry OR Building industry. The strings used for the literature search were as they are depicted in Figure 2.1.

i) women AND psychosocial AND construction work

ii) women AND psychosocial AND construction industry

iii) female AND mental-wellbeing AND building industry

Figure 2.1: Search Strings used in the literature review

2.7 THE SEARCH PROCESS

The search process was done presented in terms of the 3 search engines that were used, the Asce library, Emerald and Science Direct. The Asce Library was accessed through the University library an advanced search was done; filtering articled that were published between 1993-2019 in English. About 149 studies were attained after application of the 3 search strings in Figure 2.1. Thereafter title screening was conducted on all the articles only 17 articles for abstract reading remained.

Emerald was the second database accessed the advanced search along with the filtering of the publication date as per the inclusion criteria was applied, studies published between 1993-2019.A total of 1838 articles were retrieved using the 3 search strings as described in Figure 2.1. After title screening only 9 articles fitted the criteria for abstract reading.

Science direct was the third database, the search yielded a total of 1443 studies by applying the filtering on the advance search as per the inclusion and exclusion criteria, using the search strings on **Figure 2.1**. From the title screening only 7 studies were eligible for abstract reading.

There were other resources that were identified through the reference list, a total of 334 studies were identified, title screening was done only 24 were selected for title screening. A summary of the search process is highlighted in **Table 2.3.**

TABLE 2.3 The computerized database search

Database	Keywords combined	Number of articles	Number after title screening	Number after abstract reading	Included	Date retrieved
Asce Library	Women AND psychosocial AND construction work	15	3	1	1	23.09.2019
	Women AND psychosocial AND construction industry	13	9	3	2	23.09.2019
	Female AND mental-well-being AND building industry	121	5	0	0	23.09.2019

TOTAL		**149**	**17**	**4**	**3**	
Emerald	Women AND psychosocial AND construction work	488	1	0	0	25.9.2019
	Women AND psychosocial AND construction industry	350	2	0	0	25.9.2019
	Female AND mental-well-being AND building industry	1000	6	2	2	26.09.2019
TOTAL		**1838**	**9**	**2**	**2**	25/9/2019

Science direct	Women AND psychosocial AND construction work	824	2	0	0	28.09.2019
Science direct TOTAL	Women AND psychosocial AND construction industry	403	2	1	1	28.09.2019
	Female AND mental-well-being AND building industry	216	3	0	0	28.09.2019
		1443	**7**	**1**	**1**	
Others: reference lists	At least 2 keywords from reference list articles	334	24	1	1	30.9.2019
TOTAL		**334**	**24**	**1**	**1**	30/9/2019
TOTAL for Table 2.3		**3764**	**57**	**8**	**7**	30/9/2019

2.7.1 The inclusion and exclusion process

Based on Table 2.3 about 3764 studies retrieved were subjected to scrutiny by applying the inclusion and exclusion criteria which was that the studies had to include at least two keywords strictly by two independent reviewers, the student, and the supervisors. This was done to check if the inclusion and exclusion criteria were applied appropriately during the search and retrieval process. After the first exclusion meeting, consensus was reached on 7 articles for preliminary inclusion. A summary is depicted in Figure 2.2, The PRISMA flow chart below.

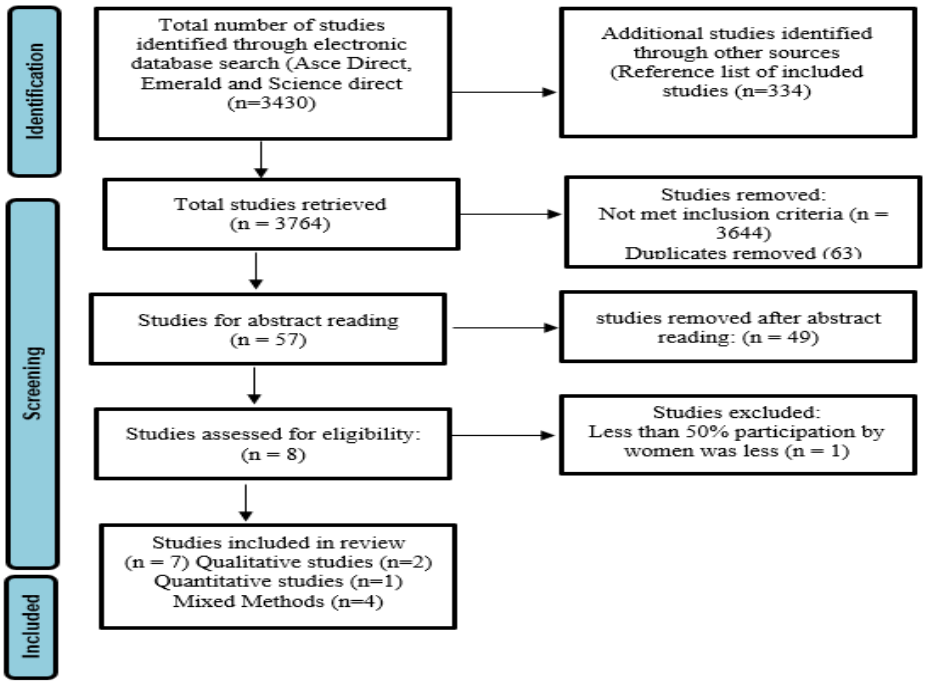

Figure 2.2: The PRISMA Flow Chart (McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al., 2020)

2.7.2 Search Outcome: Results from the Electronic Search as depicted in Prisma Flow Chart

As indicated in Figure 2.2, using the search strategy, which included electronic database and from reference list of included articles, this gave us n=3764. The 3764 articles from the electronic database search were title screened, thereafter 63 duplicates were removed, a further 3644 were removed and 57 articles were identified from just tittle screening. Thus 57 articles were eligible for abstract reading, 8 were identified from abstract reading for full text reading, 49 articles were excluded. Then the 8 articles were further scrutinized by two independent reviewers. This time the inclusion and exclusion criteria were followed, full reading was done and one of the inclusion criteria was that the participants had to be at least 50% in the included in the study only 7 articles were identified, and 1 was disregarded due to not meeting the criteria, for 50% of women participants.

2.7.3 Reasons for exclusion

The selection and screening process of studies for inclusion were based on the inclusion and exclusion criteria that was set before the study. A clear aim and a well-formulated criteria were set by the reviewers before the search was done and it was adhered to during the decision-

making process of which studies to exclude. Initially articles were excluded based on their titles. Studies that were not aligned with what the researcher was investigating to the topic were initially excluded. Duplicates were also excluded.

Majority of the studies were also excluded based on the content of their abstracts as they did not align to the inclusion and exclusion criteria. Those that were aligned with the inclusion criteria, 7 of them were included in the study. Majority of the excluded studies focused on people employed in the construction industry, but not necessarily women and the inclusion criteria required for at least 50% of women participants.

2.7.4 Selection and screening process

The selection criteria were applied to the titles and the abstracts of the studies that were retrieved from the databases for the literature search. The aim of this was to find the sources relevant in answering the research question and which fell into the eligibility criteria as indicated. Criteria followed for inclusion of articles included:

i) A total of 3764 studies were attained, then 63 studies were removed as they were duplicates, further 3644 studies were removed based on title screening as they did not match the inclusion criteria.

ii) Only 57 Studies were identified for abstract reading and 49 were removed based on inclusion and exclusion criteria.

iii) Thereafter, only 8 studies remained for full article reading,

iv) After full article reading, only 7 studies were identified to be included in the review.

2.8 METHODOLOGICAL RIGOUR

The following considerations applied:

The research proposal was reviewed by the Department of Nursing Education at the University of the Witwatersrand, and an ethical waiver was granted as the study did not include participants and approval of the topic was granted from the postgraduate department in The University of Witwatersrand. The validated Johns Prisma collection tool was used to extract

information from the included articles. Inclusion of articles was based on the pre-identified inclusion criteria identified in this document and was done by two reviewers, who is the researcher and the supervisors. Studies that did not meet the inclusion criteria were excluded. The supervisors served as a co-reviewer/coder to limit individual bias, when disagreement arose between the two reviewers on an aspect of the review, a pre-identified third party was to be consulted to resolve the conflict. However, there was no need to involve a 3rd party due to the supervisor and the researcher having agreed on the articles that were presented. Mendeley data management system was used for abstracts files reviewed, full texts retrieved, and articles included or excluded for paper trail.

2.9 SUMMARY

Chapter two has described problem identification, the literature search method, and went into detail on how the databases were chosen, the eligibility criteria of the studies, the computerised search along with the Prisma chart flow on the included articles and excluded articles. The next chapter discusses the process of data evaluation, the quality appraisal process, and the methodological rigour.

CHAPTER THREE

DATA EVALUATION

3.1 INTRODUCTION

The previous chapter presented the search method that was adopted, the eligibility criteria of the articles, the databases that were used to search, literature including the search strategy. This chapter focuses on data evaluation which included the data extraction and quality appraisal process and finally discusses the methodological rigour as ensured in each stage.

3.2 DATA EVALUATION

When the literature search has been concluded it is followed by the data evaluation stage. This stage is important for integrity of a research review (Beyea & Nicoll, 1998; Whittemore & Knafl, 2005). Primary literature that was sourced by the researcher to be included in the integrative literature review and was divided by the researcher into two stages namely: i) Data Extraction stage and ii) Quality appraisal stage.

3.2.1 Data extraction stage

Data extraction refers to a process where the researcher sources and reports all the findings from the literature search that answers the research question. This is done in conjunction with utilizing a stepwise approach, valid tools, application of methodological rigour and an appropriate data extraction tool along with coding procedures, this is done with an intent of minimizing errors in data transcription (De Souza et al., 2010; Russell, 2005). In this literature review the primary literature that was attained by the researcher was put in a data matrix (Appendix A).

The data extraction tool that the researcher found appropriate for this study was developed by De Souza et al. (2010). It was chosen by the researcher as it has all the elements characteristics that are required to answer the research question of this research. The data matrix had the characteristics that include, the author/s of the study, the year it was published, the objective of the study, the research method that was used, the population sample and size, findings of the

study and the limitations of the study, (Table 3.3) De Souza et al. (2010). Table 3.1.1 to 3.1.3 is the data matrix, it consists of 2 quantitative articles, 1 qualitative study and 4 mixed methods that are included in the report. This data matrix summarises all the findings that were found in the included articles that to assure the validity of the articles in answering the research question, it was pilot tested before data collection commencement. The data extraction tool table was checked by the three reviewers (TW, AH and NGNM).

Table 3.1.1 shows the Quantitative studies in this study

Table 3.1.1 Quantitative data studies

Author(s), year & setting	**Journal**	**Aim of the study**	**Research methodology Design**	**Population & Sample**	**Data collection & data analysis**	**Findings**	**Limitation/ Recommendation**
Adeyemi et al. (2006) **Nigeria (Lagos Metropolitan)**	Women in Management	*To report the preliminary findings of the recent and on-going research efforts at Obafemi Awolowo University, Ile-Ife, Nigeria into the utilization of females in the Nigerian construction industry against the background of a male dominated work environment*	Quantitative approach	100 Skilled females employed in the construction industry as consultants or as in-service, whom were all in management roles, N=70 questionnaires were sent to 70 construction firms in Lagos Metropolis, to assess the numerical strength of female employees in those companies, n=44 feedback was attained, and some were disregarded as the other women recipients were clerks and were not in the field age was not considered. N= 100 questionnaires were sent to those 44	Descriptive survey, interviews and Questionnaire and the statistical tool that was used was a paired *t*-test.	a) Inadequate participation of women in Nigerian construction industry due to a notion that it is a male dominated enterprise. b) Recruitment policies of construction companies have an emphasis of work experience unfavourable to women i.e., physical energy exertion, long hours outdoor in hot and humid conditions. c)women are considered for indoor construction work i.e., design, preparation of projects, drawings of plans, estimation.	Limitation The participants of the study were only women thus there was no comparison on the men and the women in construction industry. Recommendation a) In order for women to function optimally in the construction industry of Nigeria there must be strategies that are aimed in mainstreaming more women into construction work. b) There is urgent need to revise the National Construction Policy to reflect gender issues objectively and adequately.

				companies n=70 useful female responses were received.			c) Mainstreaming of women into construction industry through counselling for females by increasing awareness of impact of women in the construction work. d) Construction of the labour pool of personnel in construction that are comprised of women professional, to have more women entry in the construction industry.
2. Kehinde & Okoli (2004). (**Abuja, Kaduna & Lagos**) **Nigeria**	Journal of Professional issues in Engineering Education & Practice	'*'to identify the impediments to women's participation in the construction industry in Nigeria and to suggest ways of enhancing their participation''*	Quantitative cross sectional	Selective sampling N=120 female participants in various construction professions, n=89 females throughout the construction firms in Nigeria. From the sample 61% was married, 70% had over 6 years' experience in the construction industry and majority were in administrative,	Cross-sectional survey design, data was analysed using simple calculation of percentages and averages	a) Women who are in construction are mainly employed as administrators, designers, and lecturers in the public sector even though they are qualified engineers as the working conditions are favourable than in the field. b) Women who are employed in the private sector usually work as consultants and site supervisors this is due to	<u>Limitation</u> a) There was minimal information on the influence of legislation, culture, and impact of religion in the workplace as it is an important aspect that governs everyday trade in Nigeria, the authors feel like it could have somehow influenced the study. <u>Recommendation</u> a) Professional associations and

				design and lecturing roles Cross-sectional survey design, data was analysed using simple calculation of percentages and averages		the perceived notion that women are unable to balance work and home demands. c) Advancement in the construction industry is influenced by marital status, as single women with no career breaks advance faster that those that are married with children.	regulatory bodies should develop plans of action to attract and retain professional women to careers in the industry through eliminating gender bias factors, giving career guidance, promoting positive policies for the industry, and providing increased publicity on career prospects for all. b) Teachers/education counsellors in educational institutions should be actively involved in highlighting the diversity of career paths preparing prospective professionals on career choices in the industry. c) Employers, the government, and regulatory bodies should evolve policies that would address those specific factors that inhibit the

							advancement of professional women in careers within the industry to reduce/eliminate the effect of such inhibitions and thus encourage women to participate in this potential economic sector. d) Further study should be embarked on concerning the influence of legislation, culture, and religious factors in relation to the major ethnic groups.

Table 3.1.2 shows the Qualitative studies in this study

Table 3.1.2 Qualitative data studies

Author(s), year & setting	Journal	Aim of the study	Research methodology Design	Population & Sample	Data collection & data analysis	Findings	Recommendation/ Limitation
1. Dainty, Neale & Bagilhole (2000) (**United Kingdom**)	Journal Of Professional Issues in Engineering Education and Practice	*'two interrelated data sets were required for this study: a progression analysis to*	Qualitative study, Grounded theory	5 of the largest firms in the United Kingdom were chosen, 41 pairs of a woman and a man were paired, 82	Interviews, a qualitative analysis package was used to analyse data (NUDIST)	a) Progression of women in the industry is slower in. the initial 10 years of entering the industry as opposed to men, it came even harder to progress	<u>Limitation</u> a) Obstacles encountered during women's early careers, and in the transition to senior

		determine the vertical progression of women's careers in comparison to men's; and a determinant analysis to explore the events and strategies that shape and influence women's progression patterns".		participants in total were selected by random stratified sampling. The sample identified women who were employed in professional positions, site positions, office-based positions such as IT support, design work and administrative with 1-25 years of experience, age was not taken into consideration.		through the organizational hierarchy once they are in project management level. b) Women verbalized to be regretful on their decision to enter the construction industry as they did not have the full idea on the nature of the industry such as work-life and harassment that they would be exposed men on the other hand had full understanding. c) Women participants felt that discrimination in the hiring process for women was rife, those that are in their late 20's and early 30's was overlooked as they are in their reproductive ages, managers hire candidates on whether they would conform to organizational norms and their work ethics. d) Women were given office-based jobs	management is not known as women don't stay for long in the construction industry. <u>Recommendation</u> a) Steps must be taken to create a more equitable work environment and produce the cultural change necessary for diversification of the workforce. b) Senior leaders from large companies to champion a movement for change within the sector and to drive equal opportunities issues to the top of the strategic agenda.

						regardless of their qualifications, some women though prefer field work as it provides experience and offers rapid promotion possibilities. e) Women who are based in the field cited to have a decline in motivation in their careers as they experience an imbalance in work and domestic life, and a few of these women wanted field work.	

Table 3.1.3 presents the Mixed Methods studies included in the review.

Table 3.1.3 Mixed Method data studies

Author(s), year & setting	Journal	Aim of the study	Research methodology Design	Population & Sample	Data collection & data analysis	Findings	Recommendation/ Limitation
1. Dainty, Asce & Lingard (2006) (**United Kingdom and Australia**)	Journal of Management in Engineering	"*To gather the range of insights required to make a thorough assessment of career influences''*	Sequential mixed methods study Both cross sectional survey and focus groups	5 companies were selected in the UK and Australian that employed enough women N= 86 informants were attained from each of the companies and women were matched with men in same positions for a stratified range of their careers. Women were matched with men colleagues based on the career path, experience, length of service in the organisation and by qualifications. The sample was all in management, aged between 22-44 and	Purposive and convenient sampling of women employed in Construction in Australian and United Kingdom on construction progression and determinant analysis	a) The process that women must go through to enter the construction industry is hard whether it is to move between companies or first entry. b) There is an informal process of managers hiring employees that have connections in the company in most case it is men as they have many social networks of contact that can secure them these positions along with having inside information to bargain better for salaries.	Limitations a) In the questionnaire some questions assumed that the respondents were all employed in an organization the was no provision for self-employed and this affected 10% of the respondents. b) The study was geographically disparate and methodologically diverse. Recommendation a) implementation of the suggested initiatives is a long-term goal

				83% of the participants were office based.		c) Women on the other hand are at a disadvantage due to the stereotypical expectations of their career and personal life in the recruitment process, as women are penalized should they choose to scale back on their careers to focus on their families this has created a culture that is unattractive to women. d)In both countries it was found that women face overt indirect discrimination in the workplace.	that will not be implemented overnight and might be met with resistance, however the authors believe that if the industry acts now by implementing steps this will create a free open work environment for all.
2. Mutanda, Sigauke & Muganiwa (2008) **(Zimbabwe)**	Journal of International Women's Studies	*"the purpose is to reduce gender barriers to women's participation in construction sector through training, networking, technical development,*	Sequential mixed methods study Both survey and focus groups	Purposive sampling of N=130 participants construction from four Urban cities in Zimbabwe n= 110 female, n=20 men. The sample comprised of 72% of literate participants**,** majority of them had secondary schooling whilst 25% finished at primary level, average	Structured questionnaires and focus groups Data analysis for questionnaires involved cleaning and organizing data (descriptive statistics) and analysing relationships using various inferential statistics including One-	a) Construction business is a lucrative business for women and profitable venture for women, in this study it is through manufacturing in the construction industry. b) Findings show that there needs to be a re-orientation of the national housing	<u>Limitation</u> a) There was no insight given on the affective strategies that can help reduce gender burden of women employed in this informal trade.

		information and advocacy"		age is 35 and they are self-employed in informal construction trades, in manufacturing of tiles and ceramics and concrete.	way analysis of variance (ANOVA).	policy framework in Zimbabwe to equip women with equipment, credit, training, and marketing skills c)Exploration of strategies that can reduce burden on gender due to social and economic activities	<u>Recommendation</u> a) Shared family responsibilities, affordable childcare centres, and greater nation-wide dialogue to break some of the entrenched and perceived socio-cultural taboos associated gender roles and occupations.
3. Oyewobi, Oke, Adeneye & Jimoh (2019) (**Nigeria**)	Engineering, Construction and Architectural Management	*''the purpose of this paper is to evaluate the mediating role of organisational commitment in the relationship between work–life balance and organisational performance of female construction professionals in the Nigerian construction industry"*	Mixed methods approach	Snowball sampling of female professionals in Medium and Large sized Nigerian Construction organization N=133 questionnaires submitted to females employed in the construction industry, n=120 questionnaires filled and worthy to be used for study. The participants all had a tertiary qualification in the field of build environment sand	Well-structured self-administered questionnaires, analysis based on the principle of partial least square of structural equation modelling (PLS-SEM) tool	a) There seems to be a relationship between work-life balance and organisational performance, job satisfaction and decreased absentees. b) Flexible work hours and adoption of a family friendly work structure will be beneficial for women employed in the industry.	<u>Limitation</u> a) Even though the study aimed to assess the work-life balance of women employed in construction and whether it's implemented by managers and companies, there was very little known about it. <u>Recommendation</u>

				were all employed, no reference was made on age or years of experience.			There is a need for future research to not only assess the interference of work-life balance on female on employees but also there is a need to have a broad picture that assesses basic work assumptions.
4. Worral et al. (2010) (**United Kingdom**)	Engineering, Construction and Architectural Management	*'The paper aims to identify the main barriers that lead to the under-representation of women in the UK construction industry'*	Qualitative, grounded theory method and quantitative data	Purposive sampling N= 231 females, n=131 respondents questionnaires were handed in either at the end of each workshop or posted back to the research team after the training event had taken place. All research findings were analysed in an ongoing process. The participants were aged between 18-65, employed in administrative, managerial, and other roles, crafts and	Semi structured questionnaire using an open grounded theory approach All the findings were analysed using keyword analysis to identify the top two barriers that women face, alongside a series of cross-cutting key themes and issues	a) Women face countless predicaments working in a white male dominated workplace, due to the culture of the organization.	Limitation a) The authors were not certain on what best facilitates promotions of equality and diversity, whether is best achieved "bottom-up" promotion through training via organisations by CPD points or "top down" process via legislative or managerial considerations. Recommendation

				trades were excluded. All the participants were required to have formal qualifications in their roles. 78 of the participants were managers, 140 in administrative roles and 13 in other i.e., customer liaison.			a) There needs to be an establishment of network opportunities for women in these organizations. b) Authors feel that there needs to be further research to ascertain whether promotion in the construction industry is facilitated by level of qualifications. <u>Limitations</u> a) The research approach that was used makes it impossible for data to be generalized which the authors feel would have yielded different results if it was done to a larger group

3.4 QUALITY APPRAISAL STAGE

Quality appraisal also referred to as the critical appraisal, it is the assessment quality of the methodology applied in the extraction of the included data as it includes the weighing of the strengths and the weakness, credibility of the articles and their significance in answering the research question (Burns & Grove, 2011). According to De Souza et al. (2010) any research study indicates the experience or knowledge that the researcher has in the subject of research, and this contributes greatly to the validity of the method utilized and conducting the research. To ensure that the quality was appraised accordingly, the researcher who has years of extensive clinical and field experience and insight in the field was supervised by a psychiatric and mental health nurse expert (NGNM) and the other an occupational health nurse expert (AH) who has successfully co-supervised various papers on the subject. The evaluation of the primary studies was a tedious process and quite complex as it was important to choose an appropriate one for this study, there are practical applications. According to Whittemore & Knafl (2005) it is recommend to that the researcher adheres to the exclusion/ inclusion criteria, this is done by utilizing a quality appraisal tools to ensure authenticity of the study and maintaining methodological rigour throughout.

The validity in the data evaluation stage can be influenced by the reviewer's own beliefs that can influence the evaluation of the included studies (Russel, 2005). In this review, three independent reviewers (TW, AH and NGNM) evaluated each article using a validated quality rating tool. The evidence appraisal tool John Hopkins was used to maintain that all the inclusion and exclusion criteria were adhered to Fig 3.1 (Appendix B). The process entailed, writing the name of the journal, the setting of where the study took place along with the sample size and composition, the name of the article, the name of the authors who were involved in the study, the publication date of the study, and whether it answers the research question if it does it is grouped into its respective appraisal category based on the type of methodology mainly quantitative, qualitative and mixed methods.

Figure 3.1 depicts the John Hopkins evidence appraisal tool (Appendix B) during data collection stage to maintain the quality of the study. The evaluation and interpretation of the quality of primary studies of different methodologies can be complex however according to Whittemore and Knafl (2005), made accessions that by maintaining exclusion/inclusion criteria

and the use of a quality appraisal tool which will help in ensuring the authenticity, methodological quality and informative value of the studies that are included for the integrative literature review.

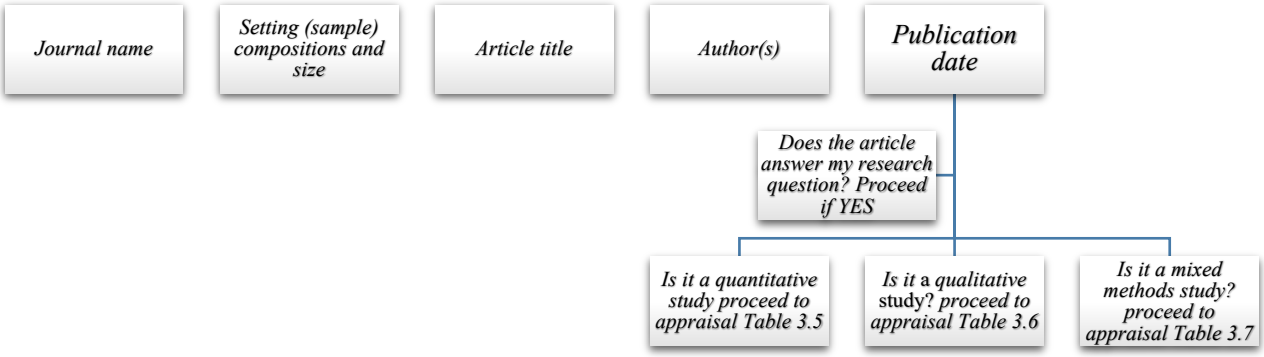

Figure 3.1 John Hopkins data collection tool for evidence appraisal

Table 3.2 indicates a breakdown of the evaluation tools that were used on the study to maintain rigour, and validity from the initial stages of data collection to eventually appraising the studies based on their respective methodologies.

Table 3.2 Summary of data tools, developers, and application to study

Name of the Evaluation tool	***Developer***	***How will it be applied to the study***
John Hopkins Data collection tool (Appendix B)	(Dang & Dearholt, 2017)	The data collection tool was used to make sure that the inclusion and exclusion criteria is adhered to, it has sections such as name of the journal, setting of the study, the title of the article, authors, date of publication, if the study answers the research question and what type of methodology was used as in **Figure 3.1.**
John Hopkins Nursing Evidence- Quality ranking system and grading tool Appendix C)	(Dang & Dearholt, 2017)	John Hopkins Nursing Evidence and grading classification system was used to grade all the included articles based on the methodology that was used, from level I to V **Table 3.2** and **Table 3.3** indicates how it is applied to this study
John Hopkins Nursing Evidence-Based Practice	(Dang & Dearholt, 2017)	The quantitative appraisal tool was used to ascertain which

Research Evidence Appraisal Tool- Quality ranking for quantitative studies (Appendix D)		characteristics the primary literature covered to appraise if the study is A- study of high quality, B- Minimal flaws in. the study or C- with major flaws **Table 3.** and application in **Table 3.6.**
John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool-Quality ranking for qualitative studies (Appendix E).	(Dang & Dearholt, 2017	Similarly, the qualitative appraisal tool has characteristics that need to be identified from the articles attained for inclusion, the study is going to be appraised according to A- Study is of high quality, B – Minimal flaws and C- a study with major flaws **Table 3.4**
John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool- Quality ranking for Mixed methods studies (Appendix F).	(Dang & Dearholt, 2017)	The appraisal tool for the mixed methods uses both the qualitative and quantitative appraisal tool on the articles **Table 3.8.1** and **Table 3.9 .2**

In summary on Table 3.2, which states that the John Hopkins data collection tool was used to collect the studies based on the literature review. The Evidence classification system was used to classify and grade all the included articles based on their different methodologies. The John Hopkins quantitative appraisal tool was used to appraise and rank the quantitative studies along with the quantitative section in mixed research studies. The John Hopkins qualitative appraisal and quality ranking was used to appraise and rank qualitative studies that were included along with the qualitative section in mixed studies. The John Hopkins Appraisal tool and ranking for mixed studies entails that for each study two approaches using the quantitative appraisal and ranking tool along with the qualitative appraisal and ranking tool on each study.

3.4.1 Description of the included studies and classification system of the level evidence

The description of studies is based on the ranking scale used in the The John Hopkins Nursing Evidence- Based Practice Appraisal Tool was used to assess the level of evidence of studies and grading as well as appraise the included studies (Dang & Dearholt, 2017). Based on the matrix, the study consists of 2 quantitative studies, 1 qualitative study and 4 mixed-method studies. This system ranked articles from: Level I to Level V a tabulated explanation is given in Table 3.3.

Table 3.3 The John Hopkins level of Evidence (Dang & Dearholt, 2017)

Level of Evidence	Methodology of study
Level I	i) Experimental study, Randomised controlled trial (RCT) ii) Explanatory Mixed method design that includes only a level I quantitative study iii) Systematic review of RCT's with or absence of metanalysis
Level II	i) Quasi-experimental study ii) Explanatory mixed method design that includes only level II quantitative study iii) Systematic review of a combination of RCT's and quasi-experimental studies, or quasi-experimental studies only with or in the absence of meta-analysis
Level III	i) Non-experimental study ii) Systemic review of combination RCTs, quasi-experimental and non-experimental studies or non-experimental studies only, with or in the absence of meta-analysis iii) Explanatory, convergent, or multiphasic mixed method studies iv) Explanatory mixed method design that includes only level III quantitative study v) Qualitative study meta-analysis
Level IV	i) Opinion of respected authorities and or nationally recognized expert committees or consensus panels based on scientific evidence: Clinical practice guidelines and consensus panels / positions and statements
Level V	i) Based on experiential and non -research evidence which includes Integrative reviews, literature reviews quality improvement program, financial evaluation, case reports, opinions of nationally recognized experts based on experiential evidence

Table 3.2 entails that all the studies were classified based on the methodology that was used in that study. The Levels of evidence in the John Hopkins evidence and quality appraisal tool guide range from level I to Level V. In this study Level IV and V studies were not used as studies in this research report are only quantitative, qualitative, and mixed method studies. Table 3.5 below is the quality grading system and the rationale for each grading.

Table 3.4 The John Hopkins Quality guide (Dang & Dearholt, 2017)

Quality rating/Grade	Rationale
A- High quality	Consistent study, reliable, generalizable results, sufficient sample size, for the study design, adequate control, definitive conclusions, consistent recommendations based on the comprehensive literature review that includes a thorough reference and scientific evidence.

B- good Quality	Reasonably consistent results: sufficient sample size for the study design, some control, definitive conclusions, reasonably consistent recommendations based on comprehensive literature review that includes some reference to scientific evidence.
C-Low quality or major flaw	Little evidence with inconsistent results, insufficient sample size for the study design conclusions can be drawn.

Table 3.4. indicates the quality rating for the included studies that were done using the John Hopkins Grading system. The rating is rated from A to C. Table 3.4 and Table 3.5 shows the application of the level of evidence and the grading system provides a clear understanding on the quality of the study.

3.4.2 Critical appraisal for quantitative studies

The quality of quantitative studies was evaluated using grading system by John Hopkins (Dang & Dearholt, 2017) for quantitative articles (Appendix D) level I to level V. The tool was developed to facilitate the critical appraisal of studies. It was chosen as it can be used by novice and experienced researchers. The tool consists of characteristics of the study that are answered by yes and no answers to ascertain the level of evidence.

Table 3.5. indicates the quality assessment rating for the quantitative studies, it also assesses the characteristics of the study by answering with yes or no questions which will utilised to ascertain which level of evidence they fall under. This is done with an intent to grade the article into Grade A to C along with the level of evidence. Table 3.5. Further features of the study are assessed to come to a better conclusion if they can be categorised as A, B and C**.**

Table 3.5. Quantitative study appraisal using the John Hopkins level of evidence and quality appraisal tool (Dang & Dearholt, 2017)

Characteristic of quantitative study	*Adeyemi et al. (2006)*	*Kehinde & Okoli (2004)*
Is this report a single research study?	✓	✓
Was there any manipulation to the independent variable?	✗	✗

Was there a control group?	✗, there was no control group in the study the study was a descriptive study and not an experimental study.	✗, there was no control group in the study, the study was descriptive.
Were study participants randomly assigned to the intervention and control group?	No, it was purposive as construction contracting companies representing big, medium, and small sized companies having headquarters or branch offices in Lagos metropolis were chosen.	✓, the women participants that are employed in the industry were randomly selected from Lagos, Abuja, and Kaduna.
If YES to 1,2,3 (LI)		
If YES to 1 & 2 or YES to 1 only (LII)	LII	LII
If NO to 1,2,3 (LIII)		
Was the purpose clearly stated	✓, "*to report the preliminary findings of the recent and on-going research efforts at Obafemi Awolowo University, Ile-Ife, Nigeria into the utilization of females in the Nigerian construction industry against the background of a male dominated work environment*".	✓ '*'to identify the impediments to women's participation in the construction industry in Nigeria and to suggest ways of enhancing their participation".*
Was the literature current (5 years?)	✗, it was published in 2005	✗, it was published in 2004
Is the sample size sufficient for study?	✓, the authors first sent an initial questionnaire to multiple construction companies to ascertain how many women employees were employed in the different companies, thus sent the second questionnaire to female employees, 720 females were identified.	✓, there were 120 questionnaires submitted and the response rate which 89 completed questionnaires were returned and were used for the analysis presented in this paper.
Does the researcher identify what is known and not known about the problem and how the study will address any gaps in knowledge?	✓, "*Since the current increasing trend in the level of participation of women in the Nigerian construction industry may not necessarily translate into adequate representation, quantitative and reliable data are, therefore, required to ascertain whether the difference in the numerical strength of male to female workforce in various aspects of construction activities is statistically significant."*	✓, "*among some of the problems that were raised, construction industry has traditionally been considered as suited only for men, and this has greatly influenced society's perception of the industry; hence, women are not generally encouraged to make professional careers in it."*
If there is a control group: Were the characteristics and/or demographics similar in both the control and intervention groups?	✗, there was no control group in the study.	✗, there was no control group in this study.
If multiple settings were used, were the settings similar?	N/A only one setting was used.	✗, the authors state that they did not take into consideration the legislative, cultural, and geographical differences on the different regions might have on the study.

Were all groups equally treated except for the intervention group(s)?	N/A no control group was used	N/A no control group was used.
Are data collection methods described clearly? *Were the tools reliable*	✓, his research was generated from primary sources using questionnaires, interviews, and visits to construction sites. The first questionnaire was distributed by hand to the management of a sample of 70 construction contracting companies. The second questionnaire was distributed to a sample of 100 skilled female construction personnel who are either in consultancy or in the service of construction contracting companies to elicit their responses on the suitability of some construction tasks for women and the constraints to female entry into the industry.	✓, the collection method was done using a reliable structured questionnaire developed to collect information about the career choice of participants, sustainability of the career, advancement in the career along with the impediments in advancing based on the profession.
Was tool validity discussed?	✓	✓
surveys or questionnaires were used, was the response rate > 25%?	✓, the response rate for the companies was 63%, and female was 70%.	✓, there were 120 questionnaires submitted and they received 89, response rate 74%.
Were the results presented clearly?	✓, they were presented on table format and bar graphs.	✓, there were clearly presented using tables, bar, and pie charts
If tables were presented, was the narrative consistent with the table content?	✓, all the tables had a narration that was consistent with the table.	✓, all the tables were clearly stated what information it presents.
Were study limitations identified and addressed? Were conclusions based on results?	✓, there were limitations and recommendations, and the conclusion was based on the results.	✓, there were limitation and recommendation that were suggested, conclusion was also based on the results.

Sub-category *A High quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence. B Good quality: Reasonably consistent results; sufficient sample size for the study design; some control, and definitive conclusions; reasonably consistent recommendations based on comprehensive literature review that includes some reference to scientific evidence.*	B	A

Table 3.5 shows that the two quantitative articles that were appraised and graded. The authors are Adeyemi et al. (2006) and Kehinde & Okoli (2004). The level of evidence for Adeyemi et al. (2006) is LII with a grading of B which indicates it was an excellent quality literature as it was consistent throughout the whole study there was an adequate study sample size, there was adequate amount of literature studies that were used to support the study and a scientific process was followed well. Lastly Okoli & Kehinde (2004) is also a LII with an A grading, indicating that it is also a good quality study, the study also followed a scientific process, the sample size used was adequate for this type of study and the response rate was satisfactory.

3.4.3 Critical appraisal of qualitative studies

The John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool-Quality ranking Summary of the individual quality rating score is presented in Table 3.6. Qualitative studies are centred around subjective data and processes; thus, a clear appraisal tool was needed to mitigate errors and interference based on the researcher' biases.

Table 3.6 Qualitative study appraisal using The John Hopkins level of evidence and quality appraisal tool (Dang & Dearholt, 2017)

Characteristics of the qualitative study	*Dainty et al (2000)*
Is this a single research study?	Yes (Level III)
Is the purpose clear and identifiable?	Yes, to gain a comprehensive understanding of the factors affecting careers that are gender specific, a comparison of women's development with that of their male peers is necessary. Such a comparison requires an assessment of both the physical nature of their career dynamics and of the determinants that define their progression patterns.
Is there a research question?	No
Is there justification for the method used?	✓
Is Phenomenon that is the focus of the research?	✓
Were the study sample participants represented?	✓
Did the researcher have knowledge of experience in the research area?	✓
Were participant characteristics described?	✓
Was sampling adequate and data saturation achieved?	✓
Is there description of data analysis?	Yes, NUDIST (Qualitative Solutions & Research Ltd., La Trobe University, Victoria, Australia).
Do findings support narrative data?	✓
Do findings from the research question match the data collected for analysis?	✓
Did data analysis verification process used in every step, confirming with participant trustworthiness of analysis and interpretation?	✗
A B High/Good quality is used for single studies and meta-syntheses2. *The report discusses efforts to*	B

enhance or evaluate the quality of the data and the overall inquiry in sufficient detail: and it describes the specific techniques used to enhance the quality of the inquiry. Evidence of some or all the following is found in the report: • *Transparency: Describes how information was documented to justify decisions, how data were reviewed by others, and how themes and categories were formulated.* • *Diligence: Reads and rereads data to check interpretations; seeks opportunity to find multiple sources to corroborate evidence.* • *Verification: The process of checking, confirming, and ensuring methodologic coherence.* • *Self-reflection and self-scrutiny: Being continuously aware of how a researcher's experiences,* *background, or prejudices might shape and bias analysis and interpretations.* • *Participant-driven inquiry: Participants shape the scope and breadth of questions; analysis and interpretation give voice to those who participated.* • *Insightful interpretation: Data and knowledge are linked in meaningful ways to relevant literature.*	

The only qualitative study that was appraised in this study was done so utilising John Hopkins grading system for qualitative studies (Dang & Dearholt, 2017) Appendix E. The authors are Daity et al. (2000) with a level of evidence of LIII, the grading of the study is an A as the study aimed to discuss and evaluate the quality of the data that was collected in the study, there is

transparency in how the study was carried out, verification was done in terms of methodological coherence and there was an insightful presentation.

3.4.4 Critical Appraisal of mixed method studies

John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool- Quality ranking for Mixed methods studies (Dang & Dearholt, 2017) This tool was used by the reviewers to be able to critically appraise the included mixed method articles, this uses both the qualitative and quantitative appraisal tools on a single article. It was chosen due to its reliability, Refer to Appendix D & E for the detail appraisal tool. Summary of the individual quality rating score is presented in Table 3.7.1 and Table 3.7.2 Table 3.7.1 is a summary of the quality ranking and quality appraisal of quantitative section of the mixed research.

The only qualitative study that was appraised in this study was done so utilising John Hopkins grading system for qualitative studies (Dang & Dearholt, 2017) Appendix E. The authors are Daity et al. (2000) with a level of evidence of LIII, the grading of the study is an A as the study aimed to discuss and evaluate the quality of the data that was collected in the study, there is transparency in how the study was carried out, verification was done in terms of methodological coherence and there was an insightful presentation.

Table 3.7.1 Mixed method study -Quantitative appraisal using The John Hopkins level of evidence and quality appraisal tool (Dang & Dearholt, 2017)

Characteristic of quantitative study	*Daity, Asce & Lingard (2006)*	*Mutanda, Sigauke & Muganiwa (2008)*	*Oyewobi, Oke, Adeneje & Jimoh (2019)*	*Worral et al. (2010)*
Is this report a single research study?	✗	✓	✓	✓
Was there any manipulation to the independent variable?	✗	✗	✗	✗
Was there a control group?	✗	✗	✗	✓
Were study participants randomly assigned to the intervention and control group?	✗	✗	✗	✓
If YES to 1,2,3 (LI)				LI

If YES to 1 & 2 or YES to 1 only (LII)		LII	LII	
If NO to 1,2,3 (LIII)	LIII			
Was the purpose clearly stated		✓	✓	✓
Was the literature current (5 years?)	✗	✗	✓	✓
Is the sample size sufficient for study?	✓	✓	✓	✓
Does the researcher identify what is known and not known about the problem and how the study will address any gaps in knowledge?	✓	✓	✓	✓
If there is a control group: Were the characteristics and/or demographics similar in both the control and intervention groups?	N/A	N/A	N/A	✓
If multiple settings were used, were the settings similar?	✗, they were not similar, it was in different countries.	✓	✗, there are large and medium sized companies.	✗, they were not similar.
Were all groups equally treated except for the intervention group(s)?	✓	N/A	✓	✓
Are data collection methods described clearly? Were the tools reliable	✓	✓	✓	✓
Was tool validity discussed?	✓	✗	✓	✓
surveys or questionnaires were used, was the response rate > 25%?	✓	✓	✓	✓

Were the results presented clearly?	✓	✗	✓	✓
If tables were presented, was the narrative consistent with the table content?	✓	✗, it was confusing.	✓	✓
Were study limitations identified and addressed? Were conclusions based on results?	✓	✓	✓	✓
Sub-category *A High quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence.* *B Good quality: Reasonably consistent results; sufficient sample size for the study design; some control, and definitive conclusions; reasonably consistent recommendations based on comprehensive*	B	B	A	B

literature review that includes some reference to scientific evidence. *C Low quality or major flaws: little evidence with inconsistent results; insufficient sample size for the study design; conclusions*				

Table 3.7.1 is a summary of 4 mixed method studies, the authors are Daity et al. (2006); Mutandwa et al. (2008); Oyewobi et al. (2019) and Worral et al. (2010). The level of evidence is LII for Daity et al. (2006) with a grading of B which is a good quality study, this is due to consistency of the quantitative method that was used, sufficient sample size for the study design, and a thorough reference in the scientific evidence. Mutanda et al. (2008) has a level of LII and a grading of B which indicates that the study is a good study with minimal flaws, there was an adequate sample size, the reference and the scientific evidence was satisfactory and there was adequate control throughout the study. Oyewobi et al. (2019) had a level of evidence LII and an A grading which is an excellent quality study, this was due to the reasons that there was an adequate sample size, the methodology was discussed and there were references and explanation on the scientific processes that the study can be replicated. Worral et al. (2010) is level of evidence LI, and a B grading is a good quality study, this is due to consistency of the quantitative method that was used, sufficient sample size for the study design, and a thorough reference in the scientific evidence.

Table 3.7.2 Mixed method study - Qualitative appraisal using The John Hopkins level of evidence and quality appraisal tool (Dang & Dearholt, 2017)

Characteristics of the qualitative study	*Daity, Asce & Lingard (2006)*	*Mutanda, Sigauke & Muganiwa (2008)*	*Oyewobi, Oke, Adeneje & Jimoh (2019)*	*Worral et al. (2010)*
Is this a single research study?	✗ (LII)	✓ (LIII)	✓ (LIII)	✓ (LIII)

Is the purpose clear and identifiable?	✓	✓	✓	✓
Is there a research question?	✓	✓	✓	✓
Is there justification for the method used?	✓	✓	✓	✓
Is Phenomenon that is the focus of the research?	✓	✓	✓	✓
Were the study sample participants represented?	✓	✓	✓	✓
Did the researcher have knowledge of experience in the research area?	✓	✓	✓	✓
Were participant characteristics described?	✓	✓	✓	✓
Was sampling adequate and data saturation achieved?	✓	✓	✓	✓
Is there description of data analysis?	✓, a progression and determinant analysis	✓ Data analysis for questionnaires involved cleaning and organizing data (descriptive statistics) and analysing relationships using various inferential statistics including One-way analysis of variance (ANOVA).	✓, analysis based on the principle of partial least square of structural equation modelling (PLS-SEM) tool.	✓, All the findings were analysed using keyword analysis to identify the top two barriers that women face, alongside a series of cross-cutting key themes and issues.
Do findings support narrative data?	✓	✓	✓	✓

Do findings from the research question match the data collected for analysis?	✓	✓	✓	✓
Did data analysis verification process used in every step, confirming with participant trustworthiness of analysis and interpretation?	✓	✓	✓	✗
A B High/Good quality is used for single studies and meta-syntheses2. The report discusses efforts to enhance or evaluate the quality of the data and the overall inquiry in *sufficient detail: and it describes the specific techniques used to enhance the quality of the inquiry. Evidence of some or all the following is found in the report:* • *Transparency: Describes how information was documented to justify decisions, how data were reviewed by others, and how themes and categories were formulated.* • *Diligence: Reads and rereads data to check interpretations; seeks opportunity to find multiple sources to corroborate evidence.* • *Verification: The process of checking, confirming, and*	A	A	A	B

ensuring methodologic coherence. • *Self-reflection and self-scrutiny: Being continuously aware of how a researcher's experiences,* *background, or prejudices might shape and bias analysis and interpretations.* • *Participant-driven inquiry: Participants shape the scope and breadth of questions; analysis and interpretation give voice to those who participated.* • *Insightful interpretation: Data and knowledge are linked in meaningful ways to relevant literature.*				

Table 3.7.2 is a summary of the qualitative section of the mixed methods study. Daity et al**.** (2006) as a level of evidence of LII and a grading of B which is a good quality study, the efforts to enhance the quality and techniques of the data were mentioned, there were multiple data sourced and verification and coherence of the data was adhered to .Mutandwa et al. (2008) level of evidence LIII of a grading of B, good quality study, there was transparency in the study in terms of information given so as to justify study centred decisions i.e. using different places for study, there was a description of quality techniques that were applied and there was insightful data that added to what is known about the topic. Oyewobi et al. (2019) a level of evidence of LIII and a B grading, this study mentioned the verification and quality appraisal methodology used, adhered to scientific format, and reviewing of data. Worral et al. (2010) level of LIII and a grading of A, efforts to enhance the quality and techniques of the data were

mentioned, there were multiple sources and verification, and coherence of the data was adhered to, and it followed a scientific approach.

3.5 METHODOLOGICAL RIGOR

This section presents the possible biases that may have occurred during the study evaluation and data analysis. This included measures taken to minimise bias and to enhance rigor of the study.

3.5.1 Data evaluation

The measures taken to enhance rigor during data evaluation included data extraction and critical appraisal, are as follows.

3.5.2 Data extraction

A data extraction instrument by De Souza et al. (2010) was used during data extraction to get characteristics of each study. The tool was pilot tested prior to main data collection, this was done to ensure accuracy. There was no need for further review or clarification. Extracted data that was attained from included studies was reviewed by the co-coder was NGNM, and AH coded the content of the individual studies

3.5.5 Validity of the critical appraisal

The threat to the validity of the study is mostly in the critical appraisal stage and can be influenced the researcher having preconceived views and beliefs (Russel, 2005). If there is an influence on personal beliefs of the quality of the literature or if any stage of the literature review is influenced this can in turn reduce the validity of the study, thus by the researcher using a critical appraisal tool assists in increasing the objectivity of the review (Russel, 2005). For the researcher to be able to increase the rigour of the integrative literature review study there must be a thorough discussion on the authenticity, the quality of the methodology and full representativeness of the available primary resources (Whittemore & Knafl, 2005). The primary studies identified were representative of the research question of this study and there was a strict inclusion and exclusion criteria.

The appraisal quality of the study requires some form of experience, insight, and training. The reviewer of the literature research review (TW) underwent a session on how to critically appraise literature. In a research literature there at least must be two independent reviewers during the appraisal process, in this study two independent reviewers (NNM and AH) appraise each other on the included studies. There is no accepted standard critical appraisal tool globally according to De Souza et al. (2010) & Whittemore & Knafl (2005), by using a validated tool can help in the methodological rigour of the integrative review. In this integrative research review a Johns Hopkins Research Evidence Appraisal Tool (2017).

3.6 SUMMARY

The chapter has described literature search process that was conducted in detail, including the description process of the included and excluded articles in the review, the types of papers, evidence grading and quality assessment process and the extracted information from the included articles and was displayed on the data matrix. Also, the methodological rigour was discussed. The following chapter analyses the data collected from the articles using the Whittemore and Knafl (2005) thematic analysis.

CHAPTER FOUR

DATA ANALYSIS, INTEPRETATION ANF PRESENTATION

4.1 INTRODUCTION

This chapter interprets the study characteristics as retrieved in the review process and finally data analysis and ends with the methodological strategies that contributed to the rigour of the review at the data evaluation and data analysis stage. Lastly, the chapter ends with discussion of the measures taken to ensure the rigour of the study.

Data analysis in this research report was conducted using the thematic analysis process by Wittemore and Knafl (2005). This process is divided in five phases namely: data reduction, data display, data comparison, drawing of conclusion and verification. The intent of analysing data was to have an integrated unbiased approach when it came to interpreting the collected studies (Cooper, 1988; Russel, 2005; Whittemore & Knafl, 2005). In an integrative literature review errors mostly are attained in the data analysis stage, there-fore it is essential to adopt an analytic method to mitigate such errors (Whittemore & Knafl, 2005).

In this integrative literature review, the data analysis process was conducted using Whittemore & Knafl (2005) in the data analysis stage, as the studies that were attained were displayed, compared to draw conclusions from the studies.

4.2 INTERPRETATION AND PRESENTATION

This is the last stage of the integrative review. The new research evidence gathered from this review as stipulated by Whitemore and Knalf (2005) can be presented in terms of summary, and synthesis. These authors indicates that from the primary studies included in the review should capture the depth of the study to allow readers to evaluate the basis for the conclusion drawn.

It is important that the results that are attained from this study from the primary studies that are included capture the essence of the study so as the reader can evaluate and be able to replicate the study and still reach the same conclusion (Whittemore & Knafl, 2005).

The next section provides the discussion on the review findings.

4.3 RESULTS

This review aimed at gathering research evidence to describe the psychosocial work environment of women in construction industry from existing literature. The initial search using Asce library, Emerald and Science Direct, a follow up search was done using the reference list of the included studies. The inclusion criteria were articles that had to have met at least two of the three search terms, be published between 1993-november 2019, published in English and the articles that did not meet the inclusion criteria were disregarded and excluded. The 3687 studies from the electronic databases. After going through a rigorous inclusion process only 7 studies were included. This time the inclusion and exclusion criteria were strictly followed, full reading was done and one of the inclusion criteria was that the participants had to be at least 50% included in the study, only 7 articles were identified in Figure 2.2 for the PRISMA flow chart.

4.3.1 Distribution of studies included

During the data extraction it was found that the articles that were attained for the study were not uniform, it appears that the articles majority were from the United Kingdom and in the African continent were from Nigeria. This has no bearing on the construction industry; however, it is merely an indication that the articles that are published by various countries have less women participants or the absence of women totally. Table 4.1 below shows the distribution of the included studies

Table 4.1 Distribution of included studies

Number article	*Country of Publication*	*Year of publication*	*Number of authors*	*Institutional collaborations*	*Journal Published*
1.	Nigeria	2006	4	1	Women in Management
2.	Nigeria	2004	2	1	Journal of professional Issues in Engineering Education & Practice
3.	United Kingdom	2000	2	2	Journal of Management in Engineering
4.	United Kingdom & Australia	2006	3	3	Journal of professional Issues in Engineering Education & Practice
5.	Zimbabwe	2008	3	3	Journal of International women studies
6.	Nigeria	2019	4	3	Engineering Construction & Architectural Management
7.	United Kingdom	2010	3	1	Engineering Construction & Architectural Management

4.3.2 Yearly distribution of the articles

During the data extraction it was found that the articles that fit the inclusion criteria were mostly published in 2006. Two articles were attained in 2006, and in the year 2000 only one article was attained, in 2004 only article was attained, 2008 again only one article was attained, 2010 one article was attained and in 2019 again only one article was attained. This brings to a possible conclusion that there is not much interest on the research problem or that there is less than 50% female participation of women in these studies. Figure 4.1 shows the year in which the included studies were published.

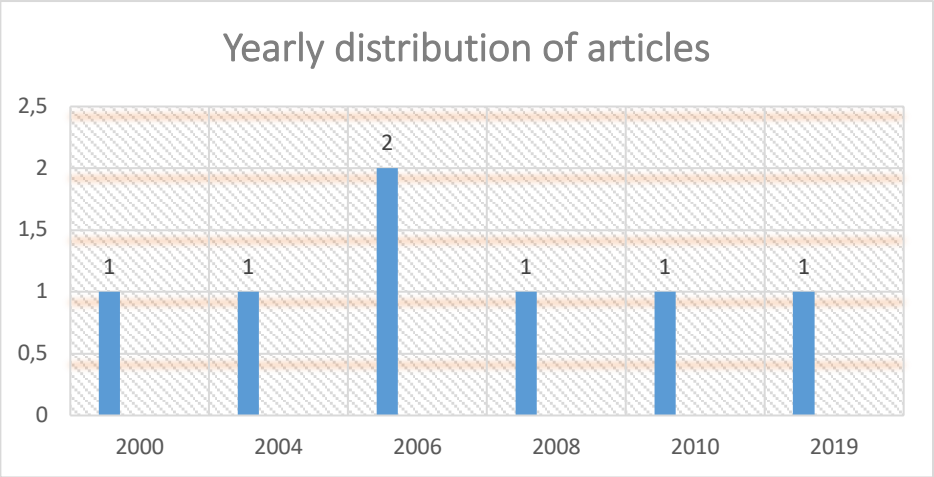

Figure 4.1: Yearly distribution of included publications

4.3.3 Number of authors per publication

Out of the 7 articles that were included in this report, majority of the authors per article were 3 at 50%. This was followed by 4 authors per article which was 33%, lastly 2 at 17%. This indicates that in most studies 3 authors were involved, which makes us conclude that with studies, authors work collaboratively. Figure 4.2 below shows authors who participate in the included studies.

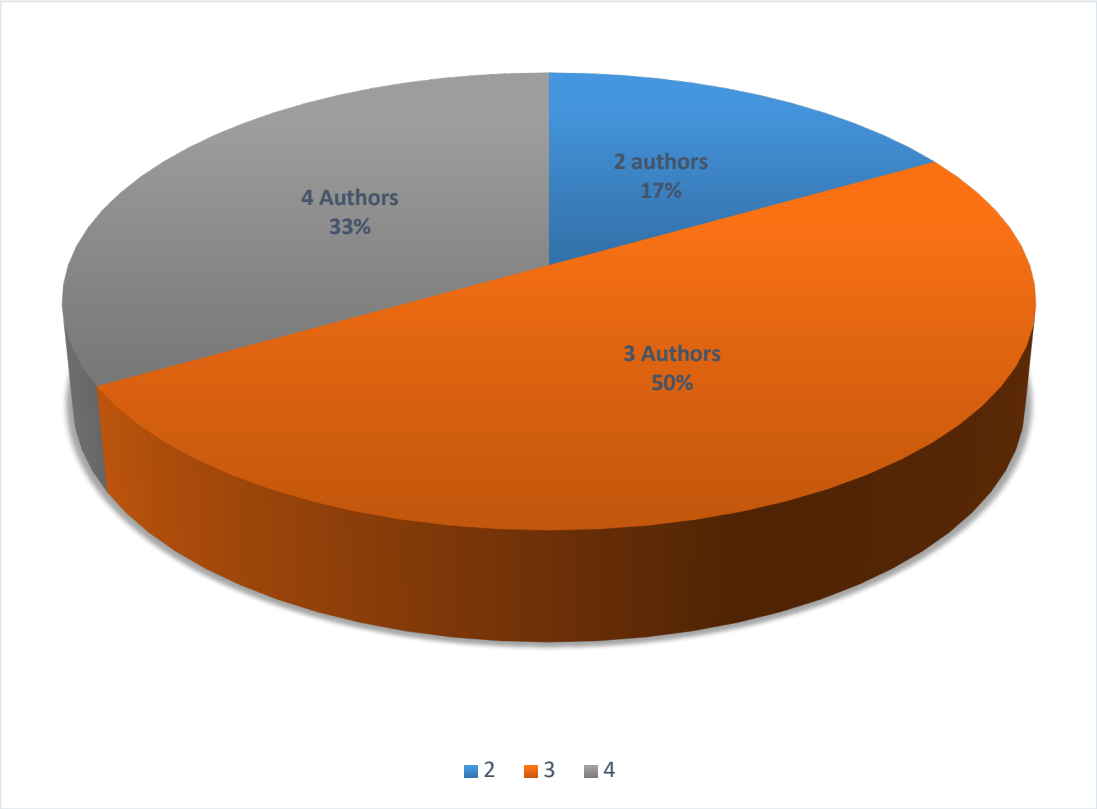

Figure 4.2: Number of authors per publication

4.3.4 Countries included articles were published

During data extraction the country of origin where the articles were published was recorded, Figure 4.4 below depicts in percentage the country of origin of the articles**.** Majority of the attained published articles were from United Kingdom and Nigeria, both at 37%. This was by followed Zimbabwe and Australia at 13%. Nigeria appears to be where most publication in the continent were attained.

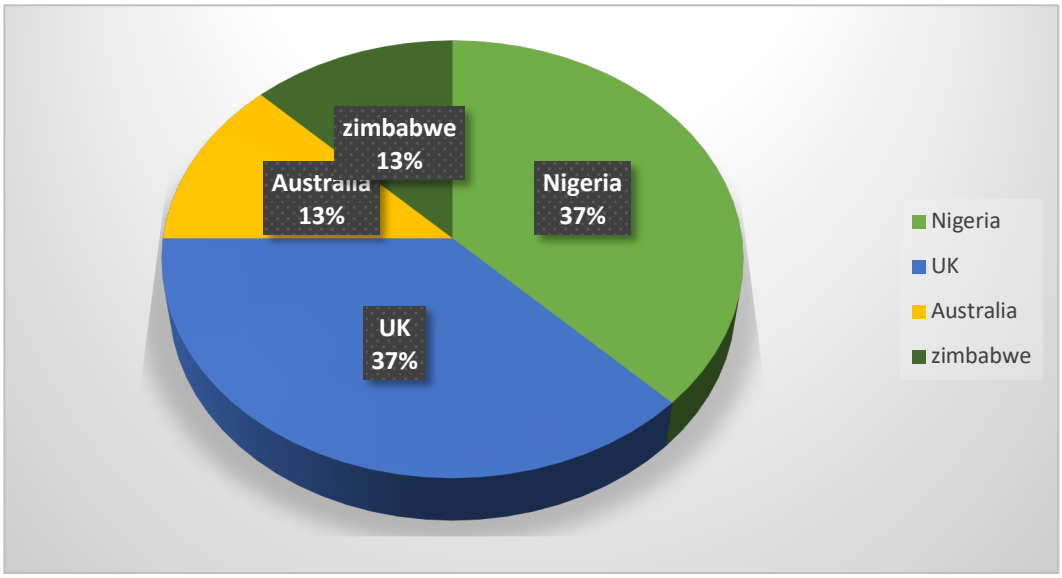

Figure 4.3: Country of publication

4.3.5 The Institution collaboration of authors in publications

Institutional collaboration indicates that the researcher extended across cultural and organizational barriers to expand on their existing scientific research network (Dusdal & Powell, 2021). During the data extraction stage, it was found that there were institutional collaborations who were involved in the studies. However, there were some of the studies who the studies were done independently, from the data we are able to deduce that some institutions are well equipped with the necessary resources that they can carry out studies independently, From Figure 4.4 we are able to deduce that, out of the 7 articles, 3 and 1 author was from the same institution whereas 1 (1) article was published by authors from one institution.

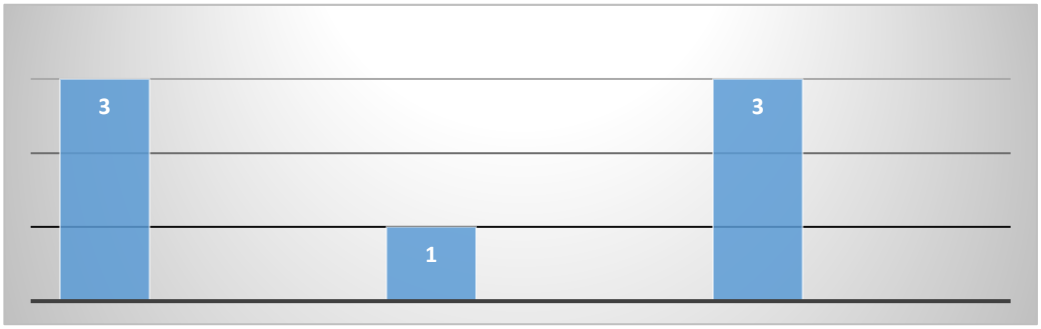

Figure 4.4: Institutional collaborations of included articles

4.3.6 Participants' characteristics

Most of the participants that were sampled in the studies on women employed in the construction industry in various ranks as it was part of the inclusion criteria, or the study had to have an equal number of female and male participants. The articles that were excluded had most male participants. There were no criteria specified for inclusion relating to age merely on the experience of working in the construction industry for women. On the included studies there were different age groups of participants and they ranged from 18-65 years.

4.4 METHODOLOGICAL QUALITY SCORE

Detailed results from the quality assessment of quantitative, qualitative, and mixed method studies are presented in Tables 3.5, 3.6, 3.7.1 and 3.7.2. Using The John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool- Quality ranking for quantitative studies as developed by Dearholt & Dang (2017). The quantitative studies using The John Hopkins Nursing Evidence appraisal tool for quantitative studies showed that the study is a Non-experimental grading study with a subcategory of B, which is a good quality study, the second quantitative study showed that it's was a quasi-experimental grade study, and an A subcategory high quality study the response rate was adequate, the only limitations was that there were only women participants which doesn't not draw parallel if these challenges are only exclusive to women.

The qualitative study was appraised using the John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool- Quality ranking for qualitative studies version 2017. The study that was used was a non-experimental grade study with a subcategory of A, which is a high-quality study, it was a longitudinal study that was done over an extended amount of time, which entailed that some of the participants who were involved in the initial stages of the study were not included at the later part of the study.

The Mixed methods study was appraised using the John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool- Quality ranking for Mixed studies version 2017 (Appendix E). The appraisal is done using both the quantitative and the qualitative appraisal tool. The quantitative part of the study, the initial study was a non-experimental grade study with a subcategory B, which shows that the scores for the quantitative score of the study was

of good quality. The qualitative part of the study meets the criteria of a quasi-experimental grade study with a B subcategory which is a good quality study. The second study of the mixed methods revealed that the characteristics of the study revealed that the quantitative part of the study is a quasi-experimental grade study with a C subcategory which is of inferior quality and the qualitative part of the study is a non-experimental grade study with a B subcategory, good quality grading study. The third study revealed that the quantitative part of the study is a quasi-experimental grade study with a subcategory of A, good quality study and the qualitative aspect is a non-experimental grade study with a B subcategory, which is a good quality study. The final fourth study showed that the quantitative part of the study is Randomised control trial grade study with a B subcategory, which a good quality and the qualitative study showed it's a non-experimental grade study with an A subcategory, meaning its of good quality.

4.5 THEMES AND SUB-THEMES

Figure 4.5 Represents an overview of the synthesis of findings, which are the findings of 'the psychosocial work environment of women construction workers' there were 4 main themes that came up namely: 'Less women representation', 'Discrimination', 'Stressful work environment' and 'labour laws.

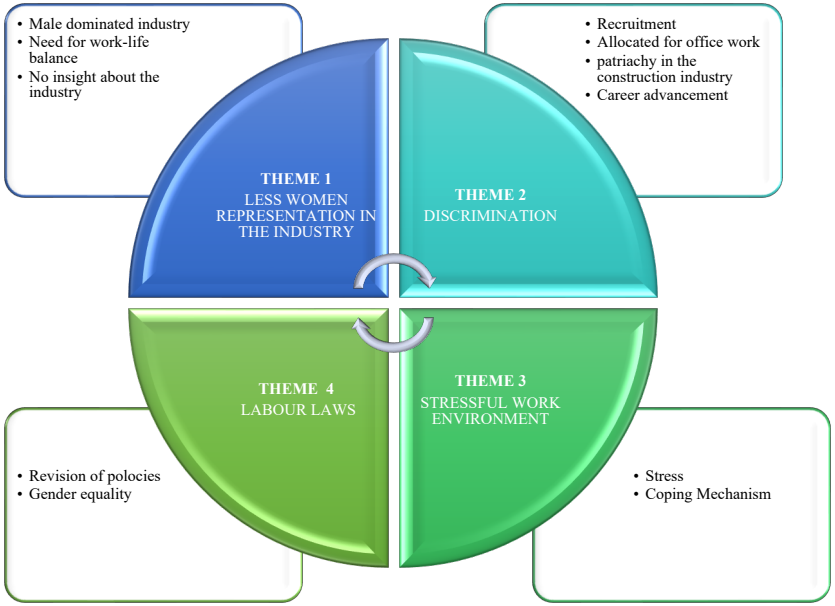

Figure 4.5 Overview of the synthesis of findings

(i) Four major themes were identified from the results of this review on The Psychosocial Work Environment of women in construction: A literature review. The identified themes are:

(i) *Less women representation in the industry*

(ii) *Discrimination*

(iii) *Stressful work-environment*

(iv) *Labour*

Table 4.2 the themes and subthemes emerging from the 7 included studies. Are outlined.

	THEME 1: LESS WOMEN REPRESENTATION IN THE INDUSTRY	
SUB-THEMES	**SUPPORTING STATEMENTS**	**71%**
• ***Male dominated industry***	• *"Females feature prominently as administrative and clerical staff in office related construction activities and a vast majority of them are employed as labourers on construction sites. They are, however, almost absent in the craft trades and as bonafide construction professiona*ls" (Adeyemi et al., 2006). • "*…men were able to concentrate on networking and using the informal nature of the industry to develop career opportunities within it. This had led to a self-perpetuating cycle, where men increased their organizational power''* (Dainty et al., 2000) • *"revealed that a major source of inequality was that women were forced to conform to the norms of the male career model"* (Daity & Lingard, 2006). • *"…attributed to a largely patriarchal society in which men dominate the socio-economic, cultural and political milieu in the country"* (Mutandwa et al., 2008). • *"…women also face the added problem of having to work within white male dominated organisational cultures"* (Worral et al., 2010). • *"…competitiveness of construction business – a phenomenon that often generate glass ceiling syndrome (inability to attain senior position in the firm) for women (Adeyemi et al, 2006)"* • *"…research into women participation in construction is scanty and, in most cases not empirically based as in the developed countries"* Adeyemi et al., 2006).	

	• *"There has been noticeable increase in female population in the engineering and environmental design curricula of the Nigerian universities and polytechnics in the last two decades. The same trend is noticed on construction sites and offices"* (Adeyemi et al., 2006). • *"increasing trend in the level of participation of women in the Nigerian construction industry may not necessarily translate into adequate representation* (Adeyemi et al., 2006*).* • *"the female unskilled labour force naturally often outnumbers males on labour-intensive construction sites in Nigeria"* (Adeyemi et al., 2006). • *"the construction industry in the country remains largely dominated by male workers. This can often be attributed to social and cultural attitudes towards women's participation in technical and engineering fields"* (Mutandwa et al., 2008). • *"Large construction companies have recently begun to recognize that workforce homogeneity is detrimental to their long-term growth.* (Daity et al., 2000).	
• ***Need for work life balance***	• *"…professional women are mainly involved as administrators, designers, and lecturers in the public sector, areas where the working hours are more favourable*." (Kehinde & Okoli, 2004). • • *"The results of the U.K. study suggest that women make a choice between work and family-oriented lives, while the Australian study confirms that women in construction question their career choices to a greater extent when work interference with family life is perceived to be high"* (Daity & Lingard, 2006). • • *"Findings also showed that there is increased gender burden (total working hours of about 9 hours per day) as women sought to strike a balance between their social responsibilities and economic activities"* (Mutandwa et al., 2008). •	

	• *"…WLB (Work life balance) has a positive impact on organisational performance, both at individual and organisational levels, its level of implementation by many managers/owners of construction organisations in Nigeria is still unknown"* (Oyewobi et al., 2019) • *"stressful, inflexible and harsh working conditions coupled with long hours of work which make it difficult for female to reconcile work requirements with family commitments"* (Adeyemi et al., 2006). • *"there is increased gender burden (total working hours of about 9 hours per day) as women sought to strike a balance between their social responsibilities and"* (Matandwa et al., 2008). • *"The observation suggests that working in the public service with a more flexible working period and seemingly less tight schedules allow professional women to combine their roles as wives/mothers with their career well* (Kehinde & Okoli, 2004). • *"…is not possible to attain a high level of professionalism in these areas without being away from home for a long period, which creates difficulty in balancing responsibilities to home and career for professional women"* (Kehinde & Okoli, 2004).	
• ***No insight about the industry***	• "*Professional associations and regulatory bodies, teachers, counsellors, and parents were found to have little influence on career guidance amongst professional women. However, peer groups and personal preference had a greater influence in women's career choice in the industry"* (Kehinde et al., 2004). • "*…where women enter construction without an in- depth knowledge of the informal aspects of the workplace culture and the inherent physical demands of the industry"* (Dainty et al., 2000). • *"…research efforts into women participation in construction in the developed countries have revealed empirically quite a number of socio-economic and cultural constraints inhibiting women entry into construction"* (Adeyemi et al., 2006). • *"…dearth of technical, financial management and associated sources of credit, marketing and business skills have been a major hindrance in the effective participation of women in South Africa's booming construction sector."* (Mutandwa et al., 2008).	

	• *"…parents and siblings have little influence on women's choice of construction-related professions" (*Kehinde & Okoli,2004). • *"…can be seen that respondents rated the student association highest in terms of creating awareness—that is to say, they benefited more from their undergraduate days"* (Kehinde & Okoli, 2004). • *"Consequently, there is now a real need to retain women in the sector, particularly as they may act as role models and mentors for women considering construction careers in the future"* (Daity et al., 2000). • *"Younger women had become disillusioned with their career choice more rapidly than men and sought to leave the industry early in their careers."* (Daity et al., 2000). • *"…they had a poor initial understanding of the culture of the industry and the other inherent difficulties of working in such a male-dominated and oriented environment"* (Daity et al., 2000).	

THEME 2: DISCRIMINATION		
SUB-THEME	**SUPPORTING STATEMENTS**	**85%**
• ***Recruitment***	• *"The recruitment policies of construction companies place great emphasis on work experience, which most often does not favour women especially in tasks involving exertion of physical energy and staying long hours in the hot humid and mosquito ridden outdoor environment of equatorial climate"* (Adeyemi et al., 2006). • *"Strategic human resources management coupled with the worldwide quest for gender* • *equality and equity are giving rise to a concern that this large segment of the country's adult population is being side-lined; from the construction industry…"* (Adeyemi et al., 2006).	

	• *"Nigerian construction industry has revealed that there is low level of women participation in construction"* (Adeyemi et al., 2006) • *"…the body should assist in forming a women labour pool from where construction companies can recruit female personnel"* (Adeyemi et al., 2006). • *"Lack of appropriate training of women in management, technical and non-traditional skills were noted as constraints that limit women participation in construction activities. These observations are corroborated by the South Africa experience"* (Mutandwa et al.,2008). • *"…64% of the 89 respondents attested to being discriminated against because of gender in their attempt at getting a job, while 36% had the reverse opinion. On employers' preference for male profession"* (Kehinde & Okoli., 2004). • *"…suggests the likelihood of discrimination in employment on a gender basis, but it sometimes might be difficult to substantiate this claim, particularly in the private sector, as employers are not obliged to state the basis for their choice."* (Kehinde & Okoli., 2004). • *"Women found the process of entering companies, problematic in comparison to men, both in terms of their initial entry to employment and in their subsequent attempts to move be- tween different companies"* (Daity et al., 2000). • *"…men tended to use wide networks of contacts to secure positions and good remunerative packages, whereas women were disadvantaged through stereotyped expectations of their career and personal priorities during the recruitment process."* (Daity et al., 2000).	

Allocated for office work	• "*In this regard, therefore, women were considered quite suitable in the areas of design, preparation of working drawings, estimating and tendering, and cost management, which are only brain tasking"* (Adeyemi et al., 2006) • *"…responses showed that professional women considered working as resident officers, followed by service contractors and merchant representatives, as least compatible with their gender"* (Kehinde & Okoli, 2004). • *"…areas presenting compatible career prospects for professional women, included maintenance/refurbishing outfit, interior deco- ration, estate and maintenance, and design only" (*Kehinde & Okoli., 2004). • *"Many women's subordinate positions within the companies were attributable to them being allocated to office-based sup- port positions, as opposed to front-line management positions on site."* (Daity el., 2000).	
Patriarchy in the construction industry	• *"While the productivity of women on outdoor activities was considered incomparable with that of men, female professionals are of the opinion that there is no difference in the male/female productivity on indoor construction activities. In this regard, therefore, women were considered quite suitable in the areas of design, preparation of working drawings, estimating, and tendering, and cost management, which are only brain tasking."* (Adeyemi et al., 2006). • *"…the attitude of employers in the private sector towards the employment of professional women is influenced by their perception of women's capacity to perform on the job and the likely conflict between their home and work"* (Kehinde et al., 2004). • *"…this study has shown that women underachieved relative to men within the companies studied"* (Daity et al., 2000).	

	• *"…that women also face the added problem of having to work within white male dominated organisational cultures. These findings provide a strengthened argument for the need to establish networks, mentoring and support systems for CPD for women"* (Worral et al., 2010). • *"…they both suggest that forms of indirect discrimination shape women's careers in the construction industry."* (Daity & Lingard, 2006). • *"…belief in a low level of female intelligence; non-recognition of unmarried women and castigation of some economic activities as exclusively belonging to men"* (Adeyemi et al., 2006).	
• ***Career advancement***	• *"The progression analysis showed that the most marked disparity between men's and women's vertical advancement occurred in their early career stages. During the first 10 years of their development, men progressed at markedly more rapid…"* (Daity et al., 2000). • *"People who make the decision to "scale back" are offered fewer training opportunities, fewer challenging assignments, and provided with less coaching and mentoring than those who follow traditional career models."* (Daity & Lingard, 2006). • *"South Africa, the construction sector is the third most important sector contributing an estimated R25 billion per annum. However, women participation has largely been restricted to free community work and about 8% of construction sector managers are women* (Mutandwa et al., 2008). • *''…respondents rated the period of pregnancy as having the greatest impact on their career development in the industry, while the period of maternity follows closely."* (Kehinde & Okoli, 2004).	

	• *"For professional women in the industry, career opportunities and advancement are greatly influenced by their marital status and commitment to demands stemming from their roles as wives and mothers" (*Kehinde & Okoli, 2004). • *"…career breaks and limits their ability to explore other career opportunities*" (Kehinde & Okoli, 2004). • *"Despite the increase in female representation, concerns remain that barriers to women's career progression may threaten their continued presence in the future"* (Daity et al., 2000). • *"Before serious attempts can be made to retain women, the construction sector initially requires an empirical understanding of women's careers and the determinants of their progression in comparison to men's" (*Daity et al., 2004). • *"…men-maintained positions approximately one hierarchical level above their female pairs"* (Daity et al., 2004). • *"…comparison to the other participating companies, slower progression remained evident during the first 10 years of their careers. This suggests that women experienced obstacles to their progression during this period"* (Daity et al., 2004). • *"Women tended to be ambitious and high achieving academically, so a lack of progression quickly led to dissatisfaction"* (Daity et al., 2000). • *"problems were particularly apparent for women in their late 20s to early 30s, where they experienced significant barriers to promotion in the form of men's expectations of their likelihood of taking career breaks to have children"* (Daity et al., 2000).	
THEME 3: *STRESSFUL WORK EDNVIRONMENT*		
SUB-THEME	**SUPPORTING STATEMENTS**	**57%**

• **Stress**	• *"...emotional stresses, sexual advances from senior male officers, and insubordination/intimidation from male subordinates, and a good number of the respondents scored physiological stresses as having a minimal effect on their career* (Kehinde & Okoli, 2004). • *"Women were surprised to find that they confronted barriers to their progression such as sexist behaviour, harassment, deliberate attempts to undermine their workplace contribution, and work/family conflicts"* (Daity et al.,2000). • *"Women spent longer than men in virtually all positions before gaining promotion"* (Daity et al., 2000).	
• ***Coping Mechanism***	• *"...required to play a leadership role in mainstreaming women into construction through career counselling for females and dissemination of news on the impact of women in the construction industry"* (Adeyemi et al, 2006). • "*Having entered the sector, the negative attitudes that women confronted were found to have necessitated them to focus merely on coping with the hostile work environment*." (Dainty et al., 2000). • *at equip them to negotiate difficult working environments and male dominated organisational cultures."* (Worral et al., 2010).	

THEME 4: *LABOUR LAW*		
SUB-THEME	**SUPPORTING STATEMENTS**	**71%**
• **Revision of policies**	• *"…strategies aimed at mainstreaming women into construction need to be embarked upon……there is an urgent need to revise the National Construction Policy of Nigeria to reflect gender issues adequately and objectively."* (Adeyemi, et al., 2006). • *"further, such policies are unlikely to address the attitudinal barriers that exist to the wider acceptance of the employment of women"* (Daity et al., 2000). • "*That construction organizations do not provide alternative career paths or flexible work options, beyond those re- quired by the legislation* (Dainty & Lingard, 2006). • "*…construction firms will need to use work-life balance policies as a strategy to recruit more female and/or professional employees in the future"* (Dainty & Lingard, 2006). • "*need to re- orient the national housing policy framework in Zimbabwe so that it explicitly incorporates the specific needs of women"* (Mutandwa et al., 2008). • *"…with supportive or family-friendly policies experience less conflicts between work and family responsibilities, thus exhibiting higher affective commitment towards the organisation*" (Oyewobi et al., 2019). • *The National Housing Policy spells out a participatory development strategy, which recognizes the involvement of all key stakeholders in housing delivery. It also recognizes non-discrimination based on gender as one of its key facets (National Housing Policy for Zimbabwe* (Mutandwa et al., 2008). • *"Women in Construction project which broadly seek to address the gender imbalances that currently characterizes the Zimbabwean construction industry through policy and advocacy and direct provision of the requisite technical, and business management skills and equipment for use by women* (Mutandwa et al., 2008*).*	

	• *"…make informed judgments of how to develop human resources management (HRM) policies to develop a fair and equitable work environment"* (Daity et al., 2000).	
• **Gender equality**	• "*…research is required to ascertain whether the promotion and facilitation of equality and diversity is best achieved within a "bottom up" process*" (Worral et al., 2010). • "*…process through legislative or managerial policies and practices, serves as a stronger instigator of positive change to organisational cultures and the barriers that women face" (*Worral et al., 2010). • *"…these inherent biases led to the promulgation of the National Gender Policy in 2001, which seeks to promote gender equity and equality in full recognition of the needs of Zimbabweans*." (Mutandwa et al., 2008). • *"The Women in Construction project was started in the year 2002 by a local development agency as one of the harbinger women focused construction programs on the country"* (Mutandwa et al., 2008).	

4.5.1 Theme 1: Less women representation

The synthesised findings indicate that there is less women representation in the construction industry even though throughout the years there has been an increase in their participation. The industry itself is viewed as a trade fit for men, women who are in the industry experience unique challenges which were namely that the industry is male dominated which comes with a cultural shift that seems only fit for men. The second challenge was identified as the need for work life balance, the industry is challenging in nature based on the demands of projects this proves to be quite challenging for women, more so those who are married and have kids as they are deemed as the primary caregivers thus their personal or obligations are affected in the process. Lastly there seems to not be any insight about the industry, this pertains to the daily expectations and the true nature of the industry, which mostly is the male dominance (Adeyemi et al., 2006; Daity et al., 2000; Daity & Lingard, 2006; Mutandwa et al., 2008).

Women representation in the construction industry was found to be beneficial as women have unique skills that they can bring in the industry. It is important that there is a cultural shift that can facilitate this transition to attract more women into the industry, the theme was further categorised into 3 sub-themes below namely, male dominated industry, need for work-life balance and No insight about the industry

4.5.1.1 Sub-theme: Male dominated industry

Women who are employed in the construction industry are allocated clerical and administrative work regardless of their qualifications in the engineering trade, some opted for office bound work due to the less demand and some felt pressured to choose this. This was done with an intent avoid them working in the outdoors and allocating them work deemed more suitable for women. The more experienced women in the industry seem to be accepting to the status quo. Some of the studies did not indicate a specific time frame as women are in the industry however the average years that they spend in a company prior to exit is 5 years. In the construction industry women have experienced a patriarchal society in the workplace where men are deemed superior to women based on expertise and experience which is largely true as women are mostly confined in the office. There is a culture of white male competitiveness and dominance, and women are forced to conform to these practices that are already in existence prior their entry into the companies.

There is a glass ceiling phenomenon that exists that exists whereby only a certain number of women in the industry can be hired to maintain the existing culture of male dominance. This phenomenon is further perpetuated by the informal network practices that exist whereby its mostly males creating a somewhat comradeship that extend into the workspace (Adeyemi et al., 2006; Daity et al., 2000; Daity & Lingard, 2006; Mutandwa et al., 2008).

In some countries there seems to be more unskilled construction workers who are mostly women as opposed to the skilled construction workers. According to the studies included on this literature study, it can be asserted that there seems to be an equal distribution of studies in Africa and Europe. In the past two decades there has been a significant increase of women who are enrolled in higher institutions in Engineering and Built Environment, even though there has been an increase of women in the industry this does not equate to an adequate representation (Adeyemi et al., 2006; Daity et al., 2000; Daity & Lingard, 2006; Mutandwa et al., 2008). Many large companies are seeing merit in hiring women for the long-term growth of the industry. The industry remains male dominated due to the attitudes of men who are in the industry (Adeyemi et al., 2006; Daity et al., 2000; Daity & Lingard, 2006; Mutandwa et al., 2008).

4.5.1.2 Sub-theme: Need for work-life balance

The synthesised findings suggest that professional women who are employed in the construction industry some expressed that they chose administrative, designing, lecturing jobs, and working in the public sector due to the flexibility that the job offers. Findings also show that some of the women who are working in construction make a choice to either have a family or a career and whilst others questioned their careers when it interfered with their family life. There is a gender burden that seems to be on women as they must juggle between home and family time and the more demanding or longer, they are involved in work activities, home life ultimately was disrupted (Adeyemi et al., 2006; Kehinde & Okoli, 2004; Mutandwa et al., 2008; Oyewobi et al., 2019).

Work life balance has an impact on the performance of employees however the level of how its implemented by managers is unknown. Due to the nature of the industry, the stress, inflexible hours, and the harsh environmental conditions make it hard for women to balance work and home life. Being away from work often due to personal obligations is frowned upon

in the construction industry and this can be extremely hard for women as they find difficulty balancing both home and work life (Adeyemi et al., 2006; Kehinde & Okoli, 2004; Mutandwa et al, 2008; Oyewobi et al., 2019).

4.5.1.3 Sub-theme: No insight about the industry

Women who are employed in the industry have verbalised to have entered the industry without having in-depth knowledge about the informal aspects in terms of the culture and demands. Women had a poor understanding on the culture of the industry and the other difficulties that they would be exposed to by working in male orientated environment subsequently women who had just entered the industry some left due to this culture in the early stages of their careers (Adeyemi et al., 2006; Daity et al., 2000; Kehinde & Okoli, 2004; Mutandwa et al., 2008).

Family offers little influence or none in encouraging women to enter the construction industry. Teachers, construction professionals and career councillors were found to have little contribution in influencing women to take part in the construction industry peers however were found to have the biggest influence in their career choice in entering the industry. There has also been found that distain by women in entering the construction industry in developed countries is largely due to socio-economic and the cultural aspects of the industry. The other eventual decrease of women participation in the industry is technical, financial, and business skills training in the industry. To retain women in the industry for future sustenance there needs to be mentors and role models for women in the industry (Daity et al., 2000; Kehinde & Okoli, 2004; Mutandwa et al., 2008).

4.5.2 Theme 2: Discrimination

Findings show that women experience biases working in a predominantly male dominated industry. This were largely due to their gender and not necessarily based on their knowledge about the industry. In some instances, it is masked as assisting women to find their niche in the industry and other times it is overtly open and clear that they are not needed in the industry. There are four sub-themes that came up based on the type of discrimination that women face in the construction industry, namely recruitment, Allocated to office work, patriarchy in the construction industry and career advancement.

4.5.2.1 Sub-theme: Recruitment

The synthesised findings suggest that in the pursuit of inclusivity in the construction industry there is a concern from human resources that a large segment of women is side-lined from the industry. Most of the policies that are in existence put more emphasis on the work experience of women dependent on working in the field and harsh outside climate which is not favourable towards women as they are allocated to desk jobs. Women found that the process of entering the industry and moving in between companies was a difficult process. In countries like Nigeria there is a low participation of women in the construction industry, and they emphasise on a need and formation of a policy that supports an establishment of a. personnel pool that comprises of women professionals who are in the construction industry. Lack of training of women in management, technical skills and other skills is a hinderance in women getting jobs in the construction industry. Most women participants attested that they experienced some discrimination in their pursuit of seeking employment in the industry and preference was more on men candidates and a small percentage stated that they did not experience this. Findings also state that there is merit in saying that women they felt that they were discriminated against based on their gender however this claim is hard to substantiate since companies more in the private sector are not obliged to state their recruitment choices. Men have networks and contacts in different companies thus can secure positions and have insight of remuneration packages and women were at a disadvantage. (Adeyemi et al., 2006; Daity et al., 2000; Kehinde & Okoli, 2004; Mutandwa et al., 2008).

4.5.2.2 Sub-theme: Allocated for office work

The synthesised findings state that the areas in the construction industry where women are mostly found is in maintenance, interior decoration estate and design. Women are found to be more suitable by the industry in areas of design, drawing and other brain tasking jobs. Women thus are in subordinate positions due to the reason that they are based in office based and support positions and not in management positions. Women stated that they are more comfortable working as resident officers, contractors, and merchant representatives as they are gender compatible (Adeyemi et al., 2000; Daity et al., 2000; Kehinde & Okoli., 2004).

4.5.2.3 Sub-theme: Patriarchy in the construction industry

The synthesised findings suggest that women have additional challenges when it comes to male dominated work environment. Women face indirect discrimination in the workplace and this

shapes the course of their career in the industry. Women were found to have underachieved in the industry as opposed to men in similar fields. The attitude of employers more so in the private space is such that women's capability of managing home and work is assessed and their ability to perform the job. While there is a notion that men can perform field work better than women, women state that there is no difference in their productivity working in the outdoors or in the office. (Adeyemi et al., 2006; Daity et al., 2000; Dainty & Lingard 2006; Kehinde & Okoli, 2004; Worrall et al., 2010).

4.5.2.4 Sub-theme: Career advancement

The synthesised findings state that in the progression of 10 years it was found that men advanced more rapidly as opposed to women. Men are at least one hierarchal level above women. Only 8% of managers in the South African construction industry are women, and this industry is a R25 billion generating industry per annum which entails that, women can fill more space. Despite some of the representation of women in the industry the career progression of women in the industry threatens the presence of women in the field in future. The advancement of women who are employed in the construction industry is impacted by their marital status and if they have children, those that don't are deemed more dependable and driven. Women participants verbalised that maternity leave had negatively impacted their careers from advancing. Women who simply chose to scale back are given fewer challenging tasks and less coaching and mentoring opportunities, this results in a hinderance of possibly exploring other career opportunities. Women who enter the construction field tend to be ambitious and high achievers and this lack of progression quickly leads to their dissatisfaction in the field. There needs to be an understanding on the determinants of progression of women in the field which is not the same as to that of men in the field (Dainty et al., 2000; Kehinde & Okoli, 2004).

4.5.3 Theme 3: Stressful work environment

Work stress is a response that the employee has in response to being presented with demands and pressures which supersedes their ability to cope with these. This can be further be exacerbated by the employee feeling that there is no support from supervisors or fellow colleagues. There is a confusion between work pressure which are also referred to as work challenges and stress. Work challenges or pressure are the unavoidable aspects in the workplace and can be a great motivator but stress on the other hand can result in poor mental

and physical well-being (WHO, 2010; Curtis et al., 2018). The Sub-theme for stress was found to be stress and coping mechanism.

4.5.3.1 Sub-theme: Stress

The synthesised findings were found that some of the stress that women experience in the construction industry include, emotional stress, sexual advances from their male seniors who are male, insubordination from male colleagues who are their juniors however women participants scored physiological stress as the least stressor in the workplace. Women face challenges such as sexist behaviour, harassment and being deliberately undermined in the workplace and this results in stress. Women unlike men spend a lot of years in the same position as opposed to men. These challenges constitute as a stress source for women in the workplace (Daity et al., 2000; Kehinde & Okoli, 2004).

4.5.3.2 Sub-theme: Coping mechanism

The synthesised findings show that due to the negative and hostile work environment that women find themselves in they are more engaged in coping with the environment than focusing on work. Women in construction need career counselling prior entry into the construction industry this can assist in their retention and them having leadership roles in the industry. This will equip women with skills that will assist in navigating through a difficult work environment field dominated by men and has a culture that conforms to men too (Adeyemi et al., 2006; Daity et al., 2000; Worral et al., 2010).

4.5.4 Theme 4: Labour Law

Labour laws are the backbone of a health and a safe working environment as it is done using various legal systems that shape the workplace, foster a relationship amongst employees and employer and protect both parties (Hamouda & Abu-Shaaban, 2015). The development of labour laws is rooted in parallel with human rights and the history of the organisation (Hamouda & Abu-Shabaan, 2015). The sub-themes that were attained during the synthesis are the revision of policies, many of the policies that are still in existence in the industry are outdated and need to be revised, and the second sub-theme is gender equality, it can be argued that there is gender equality in the workplace however it does not prove to be the same in male dominated industries.

4.5.4.1 Sub-theme: Revision of policies

The synthesised findings show that there needs to be an urgent need to revise existing policies, national housing framework policy, recruitment policy and flexible work structure, so as they can reflect on gender issues that are currently prominent in the industry. These policies need to highlight the barriers that exist in regard with women who are in the industry. Issues such as flexible work options can be adopted, this will be adopted possibly under the work and life balance or the family -friendly policy which can also be used as a strategy to attract more women into the industry whilst they are able to balance work and home life. Human resources need to be involved in developing a fair and equitable work environment (Adeyemi et al., 2000; Daity et al., 2000; Dainty & Lingard, 2006; Mutandwa et al., 2008; Oyewobi et al., 2019).

4.5.4.2 Sub-theme: Gender Equality

The synthesised findings state that The National Gender Policy was founded in 2001 with an intent to promote gender equity and equality in the construction industry. The women in construction projects were founded in 2002 by a local development agency is focused on construction programs in the country. Legislative or managerial policy can help serve as a positive instigator of organisational culture and the barriers that women face. Further research is required to ascertain if the promotion is equal and diversity is best achieved within (Mutandwa et al., 2008; Worral et al., 2010).

4.6 METHODOLOGICAL RIGOUR

The presentation of the review findings is essential in building the knowledge base of the research problem. Whittemore and Knafl (2005) suggest that reported findings should be reported explicitly, taking into consideration only the available evidence so that readers can follow through the conclusion made as well as assess the basis for the conclusion drawn without exceeding the evidence. The strategies implemented by the reviewers to reduce biases and enhance the rigour of the study will be discussed below.

Data extracted from the individual studies were constantly cross-checked to ensure they represented the exact findings reported. The full test of each study was read by two independent reviewers, with data extracted compared at any stage for any differences. A certified co-coder, the second reviewer (SS), assisted the first reviewer during the categorisation of codes to ensure equal representation of the individual findings extracted.

Themes generated through a thorough thematic analysis were discussed and supported with direct verbatim illustrations from participants to maintain the integrity of the primary data and present the true quotes from participants or subjects. All findings were supported by referencing the page number of the articles. The presentation of data, interpretations and findings were devoid of the reviewers' values, beliefs, and biases. Two independent reviewers cross-examined the findings with the themes at each stage. Full text was read and re-read again, and further discussions made when any findings were misquoted. An audit trail was maintained and kept recording the thought processes behind the formulated themes, decisions, and codes, to track when concepts, similarities or relationships were identified in the data analysis, and to record rationales and consequences of decisions.

4.7 SUMMARY

This Chapter presented the results of the literature review based on the included articles. The synthesised findings were presented according to the characteristics and methodological quality. Themes that were synthesised from the review were discussed and the methodological rigour that was applied was discussed.

CHAPTER FIVE

DISCUSSION OF RESULTS, CONCLUSION AND SUMMARY

5.1 INTRODUCTION

In this chapter, the synthesised findings from the integrative review are presented and discussed in relation to research literature, the current policies, guidelines, and standard operational protocols. The strengths of the research and potential limitations of this study will also be presented, along with implications and recommendations for future nursing research, policy, training, and practices.

5.2 DISCUSSION OF FINDINGS

The integrative review sought to retrieve, analyse, and synthesise research evidence from existing literature on the psychosocial work environment of women construction workers. Five (4) themes were generated from the 7 studies that met the eligibility criteria and answered the research question, *what is the best evidence available from Jan 1993- Nov 2019, regarding of the psychosocial work environment of women in the construction and building industry?"* The four synthesised themes that characterised the psychosocial work environment of women in construction: Less women representation in the industry, discrimination, stressful work environment and labour laws.

5.2.1 Less representation in the industry

Nordberg & Johansson (2020) state that the participation of female in the construction industry has been highlighted as important to fill the labour shortage and to also promote equality in the industry. The construction remains as the most gender segregated industry globally regardless efforts to improve female participation (Nordberg & Johansson, 2020). The percentage of women participation has been consistently between 9-13% in the USA, Australia, UK & Sweden though some countries have had a slight increase (Nordberg & Johannsson,2020; Navarro-Astor, Román-Onsalo, & Infante-Perea, 2017). Women who are hired to do administrative of office bound work are accounted as those employed in the construction industry, thus it becomes a question of what a percentage of women is, who work in the construction field (Navarro-Astoret al., 2017). Clarke, Frydendal Pedersen, Michielsens, & Susman (2005) to retain women in the industry there needs to be norms that are implemented,

problems in the industry need to be publicised and visible so as women will not feel the need to leave.

In the past the kind of research that has been conducted the focus has always been qualitative studies on women in the construction industry and how they cope with problems in the construction industry, specific to their country which have mostly been qualitative studies (Nordberg & Johansson, 2020). There seems to be studies pending on how women are represented and distributed in the construction industry (Nordberg & Johansson, 2020). Existing research that is centred around women who are employed in the construction industry, however throughout the years there has been interest in these studies (Nordberg & Johansson, 2020; Fielden, Davidson & Gale, 2000).

5.2.2 Discrimination

Clarke et al. (2005) and Nordberg and Johansson (2020) stated that there are gender biased norms in the construction industry and the attitude one of the many intangible obstacles that women face. One way in which norms and values are implemented are by analysing everyday language that is used (Clarke et al., 2005). Women face discrimination such as fear that they are not meant for masculine trades, derogatory remarks and tests that are intended to deem them incapable and other indirect forms such as in selection during recruitment (Nordberg & Johansson, 2020; Bryce, Far & Gardner, 2019). The progression of female engineers was analysed in Australia, and it was found that it is common that women engineers are progressing slower as opposed to male engineers (Bryce et al., 2019). It was also found that when women return to work post maternity leave, they are allocated jobs that are beneath their skills (Nordberg & Johansson, 2020; Denissen, 2010). This demotion is often viewed as helping the women engineers cope and as support, Denissen (2010) terms it as benevolent sexism and what it is intended to do is to contribute to the notion that women don't belong in the construction industry. Women in the construction industry have been made to feel that they are accommodated in a trade that is not intended for them, this is a false assertion as the research has proven that they have a lot that they can offer to the industry. It is important that the construction industry adopts a policy on zero toleration of any form of discrimination in the workplace, this can be done by awareness campaigns on the different forms of discrimination in the workplace with an intention of preventing them. This should be done in a manner that it

is tailor design for the establishment, this is done to accommodate the current work culture so as it's not a foreign concept to the employees.

Studies have shown that women have demands that are higher as opposed to those of men, which is to prove that they can perform their roles in the workplace and domestic obligations (Nordberg & Johansson, 2020; Navaro – Astor et al., 2017). There are numerous studies that show that women enjoy working in the construction industry and have various contributions they can bring to the industry including soft skills, better communication and managing people better (Nordberg & Johansson, 2020).

5.2.3 Stressful work-environment

Nordberg and Johansson (2020) conducted a literature study titled *Women and Ideal Women: The Representation of Women in the Construction Industry*, they found that sexual harassment has been a recurring theme in most women who are employed in the construction industry globally. There have been references of other things that fuel on stress in the workplace such as feeling *'excluded'* and '*discrimination*' this is despite the existing laws and regulations that are intended to protect all employees (Nordberg & Johansson, 2020; Denissen, 2010). The masculine culture in the industry refers to women being objectified, foolish behaviour which can include touching which is referred to as horseplay, rowdy, and noisy environment (Nordberg & Johansson, 2020; Wright, 2013). In their world men view that with the presence of women their masculine culture is threatened as they are forced to deviate and conform to accommodate women, this is often met with hostility (Ness, 2012; Nordberg & Johansson, 2020). Due to this, women are often excluded in socializing as they are not viewed as team players (Nordberg & Johansson, 2020). It is important that the construction industry adopts a strict measures of abolishing sexist language which in this case translates to actions. There must be a safe platform where women can report such cases in a discreet manner which does not expose them further to workplace stress.

Majority of the studies on women in construction emphasise on the gender-biased and attitudes against women, however in South Africa English & Hay (2015) show that there seems to be a shift on the values and the attitude among young professionals even though the industry is predominantly male, this is perceived as a positive shift. On the other hand, in Sweden there seems to be the old sexist ideologies even among young professionals (Styher, 2011). On both

instances it shows that there are women in the industry who protect the notion that the construction industry is for men (English & Hay, 2015; Styher, 2011). Through the various literatures Nordberg & Johansson (2020) found that women feel that they continually must compensate by working twice as hard as men so as they can earn their keep in the industry.

5.2.4 Labour laws

There have been initiatives that have been initiated by the government along with organizations to increase women representation in the field by coming up with diversified policies to enforce equal pay and equality (Nordberg & Johansson, 2020). In Australia there is a law that requires for organisations that have hundred employees to send a report to the government disclosing the gender composition of employees amongst other things (Galea, Powell, Loosemore & Chappell, 2015; Nordberg & Johansson, 2020). Despite the efforts that were implemented the construction industry to date remains male dominated (Nordberg & Johansson, 2020; Fielden et al., 2000). Therefore, it is important initiatives that were implemented be reviewed so as they can be improved, the current statistics prove that there has been minimal increase yet shows that there is still a vast opportunity for improvement.

The construction industry has a high visibility when it comes to sexual harassment and discrimination even though there are labour laws and regulations that are intended to safeguard women from these concerns. English & Hay (2015) state that it is more likely that the construction industry is more likely continue to be the most segregated industry in the world, therefore it is important that policies are formulated by organisations and upheld in the pursuit of creating an inclusive work environment for women.

5.3 IMPLICATIONS

The implication for practice, education and further studies will be discussed in the sections below:

5.3.1 Implications for Practice

The findings of the review illustrated that women face various challenges in the construction industry, there has been progress in some countries with the intent of increasing entry of women

into the industry, however the industry remains male dominated. The findings of the review illustrate and support that, women have certain skill sets that they bring to the industry, however there are challenges that stem from the basis of their gender that derail their progression up the ladder in the same rate as men. The industry has been male dominated for so long that regardless of the entry and progress done to mainstream women into the industry it seems like the bare minimum. Women who are in the field face discrimination, sexism, hostile working environment, slow career progression and office bound jobs amongst other challenges. This poses as a challenge as it can impact how women navigate in the workplace and cope with work demands.

The implication may result in failure of retaining women in the industry due unfair labour practices. This can result in an absence of women role models for the younger professionals who are making their entry into the industry. The existing policies and regulations are not enough to retain women and to create a collaborative working environment, the attitude and biases against women must change. Sexual harassment is an issue that women globally mostly alluded to and being overlooked for promotion. This has been reported to start with the everyday sexist language and remarks that are often said and if the tone of men can be upheld at a professional level in the workplace, perhaps this can have a ripple effect to improving the climate in the industry.

The reviewed findings illustrate that women have added responsibilities that are in the workplace and domestically but are discriminated against as in the case of returning to work post maternity leave. It is important that the culture in the construction industry is altered as this pose as a threat for women in the field.

5.3.2 Implications for Research

The findings from this review would suggest that even though there are very few studies on women who are in the construction industry, there is research that supports that there are biases globally on the presence of women in the field. There are impediments that discourage women who are in the industry, some which are visible and some hidden. People's biases are different

globally in certain countries they seem to be more prevalent and harsher than other countries. This can possibly be attributed to how people view the roles of women in society.

Although there are some emerging studies of women in the construction industry, there are quite a few academic studies done in the South African context, and very few is centred on their psychosocial wellbeing in the workplace. This study can open many opportunities for future research, preferably an observational study, which refers to observing individuals from their place of employment, which is referred to as a non-controlled so as not to manipulate any of the aspects of the study (Munnangi & Boktor, 2019). This can assist with conducting future literature studies with current studies.

5.3.3 Implications for policy

The research illuminated some of the predicaments that women who are in the industry face. The existing legislation, laws and regulations need to be updated and enforced to change the industry as some of the studies deem this as an impossible task. The discrimination that women face in a time where women have made strides in various workplaces, seems to be in this industry due to the preconceived ideas of gender roles. It is important that the industry adopts their own policies as per company, as many institutions have employee challenges that are unique to them. This will further enable employees to put forward their grievances and intervention can be followed based on company policy.

5.4 STRENGTHS OF THE STUDY

The studies reviewed originated from different continents, Africa and Europe which is to bring a contrast or show similarity in women in the construction industry, based on their psychosocial navigate. This puts the research at a global perspective along with the supporting literature. The integrative review included both published (Empirical- qualitative, quantitative, and mixed method) and unpublished literature. To ensure an exhausted literature search, a qualified librarian assisted in the literature search and documentation. The researcher had to do three searches to be certain that the studies found were the only ones based on the search criteria. Search terms used were also evaluated for any changes to ensure a broader search. Similar search terms such as building industry, females and mental wellbeing were used to find a broader search. The systematic approach by Whittemore and Knafl (2005) was followed whilst

conducting an integrative review, in the layout of the study and the presentation was a transparent process. The data analysis stage was followed systematically.

5.5 LIMITATIONS OF THE STUDY

The limitations identified throughout the research review process are described below:

5.5.1 Participants

The target was women participants and due to the dominance of men in the construction industry and that in majority of the studies men are mostly chosen, the researcher under advisement of experienced researchers and peer reviewers for at least 50% participation of women in the study. The findings aren't solely those from women participants but also that of men. The criteria for participation were women who had some experience working in the construction industry, or presently working in the construction industry.

5.5.2 Time

This integrative literature review, literature search was limited to a 26-year period, with only published and unpublished studies of women in construction was identified between January 1993 and November 2019 was used. Research studies published before January 1993 and after November 2019 that might have supported and expanded the findings were not included. The 10-year period that is predominantly followed in research was disregarded as there is few studies on the study.

5.5.3 Scope Data bases

Literature search was conducted using only Asce Library, Emerald and Science Direct as these are databases that focus on Engineering and building articles along with psychological studies. Articles published in other databases that may have influenced the findings were also missed.

5.5.4 Language

The study included studies published in English only. Considering the global population, languages, and cultural diversity of women in the construction industry, the studies published

in other languages were not included. Relevant studies published in other languages potentially were missed.

5.6 CONCLUSION

The integrative review of research studies from various countries presented the psychosocial work environment of women construction workers from a global perspective. The psychosocial work environment of women construction workers is complex, with various challenges, however, has quite noticeable similarities globally. This re-affirms the attained evidence from the different studies. Women who are employed in the construction industry offer a great contribution in the construction industry. The challenges that they face affect the untapped contribution that they can bring into the industry. Reviewing of existing laws, regulations and acts will be beneficial to build confidence and improve entry of women and them being retained in the field.

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LIST OF APPENDIXES

APPENDIX A

DE SOUZA, DA SILVA and DE CARVALHO (2010) DATA COLLECTION TOOL

DATA EXTRACTION TOOL	
Author (s)	
Year of publication	
Country	
Title of publication	
Type of publication	
Aim/objective	
Population/sample	
Data collection	
Data analysis	
Results/findings	
Implications/Recommendations	
Limitations	

APPENDIX B

Johns Hopkins Nursing Evidence-Based Practice

Research Evidence Appraisal Tool (Dang & Dearholt, 2017)

Author(s):	**Publication Date**
Journal:	
Setting: Sample (composition and size):	
Article title:	
Number:	
Research Evidence Appraisal Tool	**Does this evidence address my EBP question?** **Yes** **No-Do not proceed with appraisal of this study**

Is this study:

Quantitative (collection, analysis, and reporting of numerical data)
Measurable data (how many; how much; or how often) used to formulate facts, uncover patterns in research, and generalize results from a larger sample population; provides observed effects of a program, problem, or condition, measured precisely, rather than through researcher interpretation of data. Common methods are surveys, face-to-face structured interviews, observations, and reviews of records or documents. Statistical tests are used in data analysis.

Go to Section I: Quantitative

Qualitative (collection, analysis, and reporting of narrative data)
Rich narrative documents are used for uncovering themes; describes a problem or condition from the point of view of those experiencing it. Common methods are focus groups, individual interviews (unstructured or semi structured), and participation/observations. Sample sizes are small and are determined when data saturation is achieved. Data saturation is reached when the researcher identifies that no new themes emerge, and redundancy is occurring. Synthesis is used in data analysis. Often a starting point for studies when little research exists; may use results to design empirical studies. The researcher describes, analyses, and interprets reports, descriptions, and observations from participants.

Go to Section II: Qualitative

Mixed methods (results reported both numerically and narratively)
Both quantitative and qualitative methods are used in the study design. Using both approaches, in combination, provides a better understanding of research problems than using either approach alone. Sample sizes vary based on

methods used. Data collection involves collecting and analysing both quantitative and qualitative data in a single study or series of studies. Interpretation is continual and can influence stages in the research process. Go to Section III: Mixed Methods

APPENDIX C

Quantitative Research Evidence Appraisal Tool (Dang & Dearholt, 2017)

Research Evidence Appraisal Tool

Section I: Quantitative		
Level of Evidence (Study Design)		
A Is this a report of a single research study?	☐Yes	☐No **Go to B**
1. Was there manipulation of an independent variable?	☐ Yes	☐ No
2. Was there a control group?	☐ Yes	☐ No
3. Were study participants randomly assigned to the intervention and control groups?	☐ Yes	☐ No
If **yes to questions 1, 2, and 3,** this is a randomized controlled trial (RCT) or experimental study.		**LEVEL I**
If **yes to questions 1 and 2 and no to question 3** or **yes to question 1 and no to questions 2 and 3,** this is quasi-experimental.		**LEVEL II**

(Some degree of investigator control, some manipulation of an independent variable, lacks random assignment to groups, and may have a control group).	
If **no to questions 1, 2, and 3,** this is nonexperimental. (No manipulation of independent variable; can be descriptive, comparative, or correlational; often uses secondary data).	**LEVEL III**
Study Findings That Help Answer the EBP Question	

N/A ☐Yes ☐No

☐Yes ☐No

N/A ☐Yes ☐No

☐Yes ☐No

Complete the **Quality Rating for Quantitative Studies** section

Johns Hopkins Nursing Evidence-Based Practice

☐ Yes ☐No ☐ Yes ☐No

☐ Yes ☐No

Complete the **Quality Rating for Quantitative Studies** section (below)

Quality Rating for Quantitative Studies

Circle the appropriate quality rating below:

A High quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence.

B Good quality: Reasonably consistent results; sufficient sample size for the study design; some control, and definitive conclusions; reasonably consistent recommendations based on comprehensive literature review that includes some reference to scientific evidence.

C Low quality or major flaws: little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn.

APPENDIX D

Research Evidence Appraisal Tool (Dang & Dearholt, 2017)

Section II: Qualitative		
Level of Evidence (Study Design)		
Is this a report of a single research study? **A**	☐ Yes, **this is Level III**	☐No **go to II B**
Study Findings That Help Answer the EBP Question		
Complete the **Appraisal of Single Qualitative Research Study** section (below)		

Appraisal of a Single Qualitative R

❑Yes ❑No ❑Yes ❑No ❑Yes ❑N

❑Yes ❑No ❑Yes ❑No ❑Yes ❑No ❑Yes ❑No ❑Yes ❑No

A/B High/Good quality is used for single studies and meta-syntheses[2].
The report discusses efforts to enhance or evaluate the quality of the data and the overall inquiry in sufficient detail; and it describes the specific techniques used to enhance the quality of the inquiry. Evidence of some or all the following is found in the report:

- **Transparency**: Describes how information was documented to justify decisions, how data were reviewed by others, and how themes and categories were formulated.
- **Diligence**: Reads and rereads data to check interpretations; seeks opportunity to find multiple sources to corroborate evidence.
- **Verification**: The process of checking, confirming, and ensuring methodologic coherence.
- **Self-reflection and self-scrutiny**: Being continuously aware of how a researcher's experiences, background, or prejudices might shape and bias analysis and interpretations.
- **Participant-driven inquiry**: Participants shape the scope and breadth of questions; analysis and interpretation give voice to those who participated.
- **Insightful interpretation**: Data and knowledge are linked in meaningful ways to relevant literature.

C Lower-quality studies contribute little to the overall review of findings and have few, if any, of the features listed for High/Good quality.

APPENDIX E

Mixed Methods -Quantitative Research Evidence Appraisal Tool

Research Evidence Appraisal Tool

Section I: Quantitative		
Level of Evidence (Study Design)		
A Is this a report of a single research study?	☐Yes	☐No **Go to B**
1. Was there manipulation of an independent variable?	☐ Yes	☐ No
2. Was there a control group?	☐ Yes	☐ No
3. Were study participants randomly assigned to the intervention and control groups?	☐ Yes	☐ No
If **yes to questions 1, 2, and 3,** this is a randomized controlled trial (RCT) or experimental study.		**LEVEL I**
If **yes to questions 1 and 2 and no to question 3** or **yes to question 1 and no to questions 2 and 3,** this is quasi-experimental.		**LEVEL II**
(Some degree of investigator control, some manipulation of an independent variable, lacks random assignment to groups, and may have a control group).		
If **no to questions 1, 2, and 3,** this is nonexperimental. (No manipulation of independent variable; can be descriptive, comparative, or correlational; often uses secondary data).		**LEVEL III**

Study Findings That Help Answer the EBP Question	

N/A ☐Yes ☐No

☐Yes ☐No

N/A ☐Yes ☐No

☐Yes ☐No

Complete the **Quality Rating for Quantitative Studies** section

Johns Hopkins Nursing Evidence-Based Practice

☐ Yes ☐No ☐ Yes ☐No

☐ Yes ☐No

Complete the **Quality Rating for Quantitative Studies** section (below)

Quality Rating for Quantitative Studies

Circle the appropriate quality rating below:

A High quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence.

B Good quality: Reasonably consistent results; sufficient sample size for the study design; some control, and definitive conclusions; reasonably consistent recommendations based on comprehensive literature review that includes some reference to scientific evidence.

C Low quality or major flaws: little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn.

Research Evidence Appraisal Tool

Section I: Quantitative		
Level of Evidence (Study Design)		
A Is this a report of a single research study?	☐Yes	☐No **Go to B**
1. Was there manipulation of an independent variable?	☐ Yes	☐ No
2. Was there a control group?	☐ Yes	☐ No
3. Were study participants randomly assigned to the intervention and control groups?	☐ Yes	☐ No
If **yes to questions 1, 2, and 3,** this is a randomized controlled trial (RCT) or experimental study.		**LEVEL I**
If **yes to questions 1 and 2 and no to question 3** or **yes to question 1 and no to questions 2 and 3,** this is quasi-experimental.		**LEVEL II**
(Some degree of investigator control, some manipulation of an independent variable, lacks random assignment to groups, and may have a control group).		
If **no to questions 1, 2, and 3,** this is nonexperimental. (No manipulation of independent variable; can be descriptive, comparative, or correlational; often uses secondary data).		**LEVEL III**
Study Findings That Help Answer the EBP Question		

N/A ☐Yes ☐No

☐Yes ☐No

N/A ☐Yes ☐No

☐Yes ☐No

Complete the **Quality Rating for Quantitative Studies** section

Johns Hopkins Nursing Evidence-Based Practice

☐ Yes ☐No ☐ Yes ☐No

☐ Yes ☐No

Complete the **Quality Rating for Quantitative Studies** section (below)

Quality Rating for Quantitative Studies

Circle the appropriate quality rating below:

A High quality: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence.

B Good quality: Reasonably consistent results; sufficient sample size for the study design; some control, and definitive conclusions; reasonably consistent recommendations based on comprehensive literature review that includes some reference to scientific evidence.

C Low quality or major flaws: little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn.

APPENDIX F

Ethical clearance

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

Office of the Deputy Vice-Chancellor (Research & Post Graduate Affairs)

06/01/2021

Ref: W-NN-210106-01

TO WHOM IT MAY CONCERN

Waiver: This certifies that the following research does not require clearance from the Human Research Ethics Committee (Medical)

Investigator: Ms TL-A Williams
Student No. (if appropriate): 1723371
Staff No. (if appropriate):

Supervisor: Ms A Huiskamp

School: Therapeutic Sciences
Nursring Education
Medical School
University

Project title: The psychosocial work environment of women construction workers: an integrative literature review

Reason: Literature review
No human participants will be involved in the study

Dr N Naran
Co-Chairperson: Human Research Ethics Committee (Medical)

Research Office Secretariat:
Third Floor, Phillip Tobias Building, corner of St Andrews and York Roads, Parktown, Johannesburg 2193
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https://www.wits.ac.za/research/researcher-support/research-ethics/ethics-committees/

APPENDIX G

Permission John Hopkins Research Evidence Appraisal Tool

Permission to use the Tools

HNEBP MODEL AND TOOLS- PERMISSION

Johns Hopkins Nursing
Center for Evidence-Based Practice

Thank you for your submission. We are happy to give you permission to use the JHNEBP model and tools in adherence of our legal terms noted below:

- You may not modify the model or the tools without written approval from Johns Hopkins.
- All reference to source forms should include "©The Johns Hopkins Hospital/The Johns Hopkins University."
- The tools may not be used for commercial purposes without special permission.

If interested in commercial use or discussing changes to the tool, please email ijhn@jhmi.edu.

APPENDIX H

Post graduate Approval

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172076

Reference: Mrs Sandra Benn
E-mail: sandra.benn@wits.ac.za

10 October 2019
Person No: 1723371
PAG

Miss TL Williams
160Mont Blanc
Constantia Drive
1709
1709
South Africa

Dear Miss Thato Williams

Master of Science in Nursing: Approval of Title

We have pleasure in advising that your proposal entitled *The Psychosocial work environment of women construction workers: An integrative literature review* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

APPENDIX I

Language editing

31 March 2022

TO WHOM IT MAY CONCERN

I hereby submit this letter to confirm that I have edited the following Research Report for degree Master of Science in Nursing.

THE PSYCHOSOCIAL WORK ENVIRONMENT OF WOMEN CONSTRUCTION WORKERS: AN INTEGRATIVE LITERATURE REVIEW

by

Thato Leslie-Ann Williams

**Note: It is the author's responsibility to make the changes suggested and to attend to any queries. It is also the student's responsibility to go through all references and ensure no plagiarism occurs in the proposal submitted after editing has been done.

My LinkedIn page provides information on my personal profile.

Marcel Koortzen

Independent Language Consultant (Proofreader and Copy Editor)

Certified Editor and Proofreader – College of Media and Publishing, (United Kingdom)

Member of the Southern African Freelancers' Association

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