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# Caregiver's oral health knowledge, attitudes and practices towards children with special health care needs in Harare Province, Zimbabwe

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# CAREGIVER'S ORAL HEALTH KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS CHILDREN WITH SPECIAL HEALTH CARE NEEDS IN HARARE PROVINCE, ZIMBABWE

**by**

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A research report submitted to the Faculty of Health Sciences, University of Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Dentistry (Paedodontics).

**Johannesburg, 2023**

## DECLARATION

I, declare that this research report is my own original work. It is being submitted for the Degree of Master of Science in Paediatric Dentistry at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

**Vimbai Mashanda**_____

**Signed at Harare on the 14th day of November in the year 2023.**

**School of Oral Health Sciences**

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## DEDICATION

To my parents, Mr & Mrs Mashanda for their prayers and words of encouragement.

To my siblings, Blessing, Geoffrey, Tapiwa & Rumbidzai for their unwavering support.

To my friends and dental staff, Raymond, Zenzele, Ronnel & Jesca for their support and understanding during the entire duration of the research.

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**God for giving me strength throughout this research journey.**

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**Disabled People's Organisations, for granting me permission and access to the participants during support group meetings.**

**Participants, without their participation, this research would not have been possible.**

**Thank you.**

## ABSTRACT

**Background:** Children with Special Health Care Needs (CSHCN) are prone to oral diseases such as dental caries and periodontal disease. This is due to limitations in oral hygiene practices because of their debilitating conditions. Therefore, caregivers play a major role in the maintenance of CSHCN's oral health. As a result, caregiver's oral health knowledge and attitudes are important to ensure that the oral health of CSHCN is maintained.

**Aim and Objectives:** The aim of this study was to describe the caregiver's oral health knowledge, attitudes, and practices (KAP) towards CSHCN. The objectives of the study were to determine the caregiver's demographic profile, to assess the caregiver's oral health KAP towards CSHCN and to assess whether there is a relationship between the caregiver's level of education, demographic characteristics, and oral health KAP and factors related to oral health practices.

**Methods:** A quantitative cross-sectional study design and convenience sampling method was utilised. Caregivers above 18 years of CSHCN who attended support group meetings in Harare Province, Zimbabwe and were willing to participate, took part in the study. A modified self-administered questionnaire (SAQ) was used for data collection. The SAQ comprised of a demographics section for the caregiver, child's disability type and oral health KAP questions. Two sample t-tests and Analysis of Variance (ANOVA) was used to compare the means of caregivers KAP. Multiple linear regression model was used to assess the association between caregivers' KAP and demographic characteristics. Only the variables with $p<0.15$ in the univariate model were included in the multiple linear and multivariate logistic regression models. Multivariable logistic regression was used to assess the association between caregivers' oral health practice and demographic characteristics. Apriori variables such as age, level of education, knowledge and attitude were selected for all multivariable logistic models. All variables with $p<0.05$ were considered to be statistically significant and statistical analysis were performed using Stata.

**Results:** The response rate was 76.8% (n=295). Almost 90% (89.2%, n=263) of the caregivers were females and nearly three quarters (72.5%, n=214) were

mothers. A third (33.6%, n=99) of the caregivers were aged between 31-40 years. Fifty-three percent (n=157) of the caregivers were unemployed and 61.7% (n=182) were educated up to high school level. Forty-six percent (n=135) of the CSHCN had cerebral palsy. Out of the 295 caregivers, 45.4% (n=134) had fair oral health knowledge, 79.7% (n=235) had a good attitude towards oral health and 62% (n=183) had fair oral health practices.

**Conclusions:** Most of the caregivers had good oral health attitude, however their knowledge and practices were fair. Factors associated with caregivers' attitude were their knowledge and level of education, and the caregivers' practices were associated with knowledge and attitude.

*Keywords:* Caregivers, disability, oral health knowledge, attitudes, practices

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## LIST OF ABBREVIATIONS

ASD Autism Spectrum Disorder

ADHD Attention Deficit Hyperactivity Disorder

CP Cerebral Palsy

CSHCN Children with Special Health Care Needs

DPO Disabled People's Organisations

HREC – M Human Research Ethics Committee (Medical)

KAP Knowledge Attitudes and Practices

MRCZ Medical Research Council of Zimbabwe

NIDCR National Institute of Dental and Craniofacial Research

NIH National Institute of Health

WSDH Washington State Department of Health

## LIST OF APPENDICES

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# CHAPTER ONE: INTRODUCTION

## 1.1 Introduction

The Washington State Department of Health (WSDH) define Children with Special Health Care Needs (CSHCN) as those who have or are at increased risk for chronic physical, developmental, behavioral, or emotional condition and who also require health related services of a type or amount beyond that required by children generally (Washington State Department of Health, 2012). These conditions include asthma, autism spectrum disorder (ASD), cancer, cerebral palsy (CP), Down Syndrome (DS), cleft lip and/or palate, cystic fibrosis, attention deficit hyperactivity disorder (ADHD), prematurity, speech/language delay, sickle cell anaemia, diabetes, juvenile arthritis, epilepsy, blindness, hearing loss, gross and/or fine motor delay (Washington State Department of Health, 2012).

According to the U.S. Department of Health and Human Services, National Institute of Health (NIH), National Institute of Dental and Craniofacial Research (NIDCR) oral health problems such as dental caries and periodontal disease are more common in people with developmental disabilities due to their inability to brush and floss independently (U.S. Department of Health and Human Services, National Institutes of Health & National Institute of Dental and Craniofacial Research, 2009). Similarly, it was found that the oral health status among CSHCN is worse compared to children without special health care needs and therefore need assistance from their caregivers and proper oral health management (Ningrum et al., 2021).

Therefore, caregivers' oral health knowledge, attitudes, and practices (KAP) are crucial since in most cases CSHCN are dependent on their caregivers as they have limitations in independently performing these oral hygiene practices due to their physical and or mental conditions. Caregivers should be educated about the prevention strategies, taught about the daily oral hygiene practices and adaptation of toothbrushes to make them easier to hold and given advice on alternatives to cariogenic food (U.S. Department of Health and Human Services, National Institutes of Health and National Institute of Dental and Craniofacial Research,

2009). This would assist a great deal in reducing the prevalence or eliminating oral health problems in CSHCN.

### 1.2 Problem Statement

Research on oral health has been published in Zimbabwe (Mafuvadze et al., 2013; Hedberg & Kristoffersson, 2014). However, there are no published studies yet on oral health KAP towards CSHCN. Based on the literature reviewed, it is quite evident that CSHCN have a higher prevalence of dental caries (Gace et al., 2014; Ghaith et al., 2019; Shyama et al., 2001). In addition, dental care is the most prevalent unmet healthcare need in CSHCN (Lewis et al., 2005). Moreover, oral health KAP of the caregivers has an impact on the CSHCN's oral health (Alyafei et al., 2020). Therefore, it is critical to assess the caregiver's oral health KAP towards CSHCN as caregivers' knowledge determine the oral health practice (Liu et al., 2017).

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Literature review

A literature review was conducted, and the following search engines were used; Pubmed, Google Scholar and Science Direct. The following keywords were used; “special needs, disabilities, caregivers, oral health, knowledge, attitudes and practices” to search for the relevant articles referenced in the literature review.

### 2.1.1 Definition of terms

Knowledge, Attitudes and Practices (KAP) studies describe what people know about certain things, how they feel and how they behave (Kaliyaperumal, 2004). In this study, the knowledge possessed by caregivers of CSHCN is the oral health information they possess as well as their understanding of oral health. Attitudes refer to their feelings towards the oral health subject coupled with any preconceived ideas that they may have towards oral health. Practice refers to the ways in which they demonstrate their oral health knowledge and attitude through their actions (Kaliyaperumal, 2004).

The literature review will cover the oral health status and oral diseases, unmet healthcare needs and dental access in CSHCN as well as the caregivers KAP in published studies in other countries.

## 2.2 Oral health status and diseases in CSHCN

Gace et al. (2014) found that there is an increased incidence of dental caries in CSHCN. In addition, children with down syndrome in Dubai had a higher caries rate compared to children without special needs (Ghaith et al., 2019). Similar conclusions of increased prevalence of dental caries were also reported in children with down syndrome in Kuwait (Shyama et al., 2001). Despite a higher prevalence of dental caries being noted in Dubai, the outcome could have been significantly different if the sampling strategy had included the United Arab Emirates as a whole (Ghaith et al., 2019).

Low salivary rate and chronic medication are some of the contributing factors to the increased caries risk and periodontal disease. Medications such as anticonvulsants, antihypertensives and immunosuppressants cause gingival hyperplasia and increase periodontal disease risk (U.S. Department of Health and Human Services, National Institutes of Health and National Institute of Dental and Craniofacial Research, 2009).

Dos Santos et al. (2003) found that children with cerebral palsy had higher decayed, missing and filled teeth (DMFT) and plaque indices, tooth eruption delays, higher malocclusion prevalence and bruxism in comparison to those without special needs. Other oral conditions noted in CSHCN are hyperactive bite and gag reflexes, anomalies in tooth development, size, shape, eruption and arch formation as well as fractured teeth (U.S. Department of Health and Human Services, National Institutes of Health and National Institute of Dental and Craniofacial Research, 2009).

In a study by Alhumaid et al. (2020) where the oral health of children with autism as well as the influence of parental attitudes and willingness in providing care was assessed, the results revealed that children with Autism Spectrum Disorder (ASD) have poor oral health practices and status. Similarly, in Italy, it was found that ASD children had an increased risk of caries and traumatic injuries as well as periodontal status and oral mircobiota alterations (Ferrazzano et al., 2020). Caries prevalence in primary and permanent teeth was 76% and 68% respectively and gingival problems were noted in 31% of the participants (Alhumaid et al., 2020). Gace et al. (2014) also highlighted that CSHCN had a high caries prevalence and their oral hygiene was poor resulting in their dental treatment needs being higher and in turn need more care from their caregivers (Gace et al., 2014).

Zhou et al. (2019) in their study on oral health and associated factors among preschool CSHCN, it was established that, preschool CSHCN had poor oral hygiene status while 30.3%, 89.6% and 95% had caries, gingival inflammation, and plaque respectively. Factors contributing to these findings were the developmental profile, oral health related behaviours and socioeconomic status. The oral health related behaviours that were assessed were the dietary habits, oral hygiene

practices and dental visit experience. Among these, the between meal snacking habits were reported in 83.5% of the participants. As a result, initiation of oral health promotion activities was highly recommended to improve the oral health status of CSHCN. Table 2.1 below summarizes the oral health problems in CSHCN.

**Table 2.1** Oral health problems in CSHCN

| Author and Year | Study Title | Country | Outcome |
|---|---|---|---|
| Alhumaid et al. (2020) | Oral health of children with Autism: The influence of Parental Attitudes and willingness in providing care | Saudi Arabia | High caries prevalence<br>Poor oral health |
| Gace et al. (2014) | Oral Health Status of Children with Disability Living in Albania. | Albania | High caries prevalence<br>Poor oral health |
| Dos Santos et al. (2003) | Oral conditions in children with cerebral palsy | Brazil | Children with CP had<br>Higher Decayed, Missing, Filled Teeth (DMFT), Higher Plaque Index, Tooth eruption delays |
| Ghaith et al. (2019) | Oral health status among children with DS | Dubai | Malocclusion<br>Higher caries rate in DS children |
| Shyma et al. (2001) | Dental caries experience of disabled children & young adults | Kuwait | Increased dental caries prevalence |
| Zhou et al. (2019) | Oral health and associated factors among preschool CSHCN | Hong Kong | 30.3% caries, 89.6% gingival inflammation, 95% plaque |

Although most studies demonstrated that CSHCN have more dental caries or other dental problems, in contrast, a published study in Johannesburg, South Africa, noted a lower caries prevalence in CSHCN (Nqcobo et al., 2012). However, this was due to the Community Oral Health Outreach Programme (COHOP) team's visit to the sites which had an impact in imparting oral health knowledge resulting in positive attitudes and practices among the caregivers towards CSHCN (Nqcobo et al., 2012). This proves that oral health awareness programs play a pivotal role in reducing the caries rate among CSHCN.

In addition, in a comparative study carried out in Hong Kong comparing oral health behavioral and barriers to dental care among preschool children with and without Autism Spectrum Disorder (ASD) as well as evaluation of oral health knowledge and attitudes of their caregivers, it was found that ASD children had less caries experiences, better oral hygiene and gingival health than children without ASD. These findings were attributed to the fact that caregivers of children with ASD had better scores in oral health knowledge and attitudes thus influencing the oral health practices (Du et al., 2019). It is apparent in this instance that good oral health knowledge and attitudes do influence oral health practices.

Similarly, in another study, caries experience of autistic children compared to non-autistic children was assessed, it was found out that the prevalence of dental caries in autistic children was lower, however regarding plaque indices of the two groups, no statistically significant results were noted, (Kuter and Guler, 2019). This is indicative of the fact that prevalence of oral diseases is not the same in all types of disabilities.

### 2.3 Unmet healthcare needs and dental care access

Lewis et al. (2005) indicated that the most prevalent unmet healthcare need for CSHCN is dental care. Alamri, (2022); Alfaraj et al. (2021) highlighted that there are barriers to oral care provision to CSHCN and recommended that it is crucial to have measures in place to ensure that health care facilities are accessible to CSHCN. The barriers to dental care access noted were transportation challenges, lack of wheelchair access at the dental clinics, incompetent staff, distant dental clinics, communication challenges between the dentist and special needs

individual as well as the cost of dental care among others (Alfaraj et al., 2021; Da Rosa et al., 2020). Therefore, in order to meet the dental needs of CSHCN, dentists should have adequate training and knowledge to accommodate them (Alamri, 2022; Alfaraj et al., 2021; Da Rosa et al., 2020).

An association exists between CHSCN status and complexity with unmet dental needs whereby those with more complex conditions have increased dental need (Mayer et al., 2004; Norwood & Slayton, 2013; Iida et al., 2020). For example, children who are dependent on gastrotomy tube feedings have increased calculus formation as the normal cleansing action of the oral cavity cannot occur (Norwood & Slayton, 2013).

Moreover, children with quadriplegic cerebral palsy have a higher prevalence of periodontal disease and dental caries due to poor oral hygiene, enamel hypoplasia, poor nutritional status and sugar containing medicines (Norwood & Slayton, 2013). Therefore, involvement of caregivers in oral health strategies and ensuring that their oral KAP are good will assist in the overall improved oral health in CSHCN as they can implement certain preventive oral health strategies at home to alleviate some of the challenges above.

### 2.4 Caregivers oral health Knowledge, Attitudes and Practices

According to Jan & Jan (2016), oral health is the foundation for general wellbeing; therefore, caregivers must become knowledgeable and competent in-home oral health practices such as tooth brushing and flossing. This will greatly assist in preventing the occurrence or severity of dental diseases in children with CP (Jan & Jan, 2016). Moreover, caregivers must be taught the basics about daily oral hygiene practices and informed about power toothbrushes or floss holders which aid in simplifying oral care (U.S. Department of Health and Human Services, National Institutes of Health and National Institute of Dental and Craniofacial Research, 2009).

Oredugba & Akindayomi (2008) highlighted that most individuals with special needs may have great limitations in oral hygiene performance due to their manual dexterity, sensory and intellectual disabilities. Therefore, CSHCN would benefit

from parental education on diet modification, improvement of oral hygiene practices and regular dental visits (Oredugba & Akindayomi, 2008).

The oral health status of CSHCN is generally poor and therefore caregivers' oral health KAP are important if good oral health of CSHCN is to be maintained. Wyne (2007) reported that caregivers with good oral health knowledge play a better role in the maintenance of good oral health in CSHCN. Caregivers are responsible for supervision and maintenance of their children's oral hygiene as well as their dietary habits (Wyne,2007).

Oral health KAP of the caregivers has an impact on the oral health of CSHCN (Alyafei et al., 2020). Krishnan et al., (2019) highlighted that caregiver limited knowledge contributes to the deterioration of CSHCN health. The oral health knowledge and attitudes of caregivers of CSHCN cannot be overemphasized as in most but not all cases it is linked to their practices. Table 2.2 below summaries the reported findings regarding caregivers' oral health knowledge, attitudes, and practices in published studies.

**Table 2.2** Caregivers' oral health knowledge, attitudes and practices in India, Qatar, Saudi Arabia, Taiwan & Malaysia

| Author Year | Country | Study Title | Participants | Results |
|---|---|---|---|---|
| Bhandary et al. (2013) | India | Knowledge of care providers regarding the oral health care of visually impaired children | 221 | Unsatisfactory oral health knowledge |
| Krishnan et al. (2019) | India | Knowledge, attitude and behaviour about oral health among CSHCN | 120 | Poor oral health knowledge, attitudes and practices |
| Alfayei et al. (2020) | Qatar | Knowledge, attitudes, and behavior towards oral health care among parents/caregivers of children with disabilities | 94 | Good oral health knowledge, very positive attitude, favorable behavior |
| Al-Khalifa & Alfaraj (2021) | Saudi Arabia | Oral health awareness and practices of special needs caregivers | 186 | Good awareness and practices |
| Albullais et al. (2020) | Saudi Arabia | The knowledge, attitudes, and practices about oral health care at centers for intellectually disabled | 164 | Knowledge; 12.2% good, 61.6% fair, 26.2% poor<br>Attitudes; 9.8% good 58.5% fair, 31.7% poor<br>Practices; acceptable |
| Liu et al. (2017) | Taiwan | Caregivers 'oral health knowledge, attitude, and behavior (KAB) toward their children with disabilities | 503 | Good oral health KAB behavior. |
| Halim et al. (2020) | Malaysia | Oral health knowledge, attitude, and practices of the caregiver at the special needs boarding school | 41 | Sufficient oral health knowledge, unsatisfactory attitudes, and practices. |

Previous studies have shown that caregivers' oral health KAP towards their CSHCN were poor and unsatisfactory in India (Bhandary et al., 2013; Krishnan et al., 2019) whereas in Qatar and Saudi Arabia, caregiver's oral health KAP were good, positive, and favourable (Alyafei et al., 2020; Al-Khalifa & Alfaraj, 2021). Although this conclusion was drawn in India, in one of the studies, the sample size comprised of only 120 mothers at one centre in only one city and a convenient sampling strategy was utilised (Krishnan et al., 2019). This limits the generalisability of the study results.

In Saudi Arabia and Qatar, caregivers good, positive and favourable oral health KAP were attributed to the caregiver's high level of education (Alyafei et al., 2020; Al-Khalifa & Alfaraj, 2021). This is an indicator of the existence of a relationship between the level of education with oral KAP.

However, in another study in Saudi Arabia, out of the 164 participants, 26.2%, 61.6%, 12.2% had poor, fair and good knowledge levels respectively and 31.7%, 58.5% and 9.8% had poor, fair and good attitude respectively (Abullais et al., 2020a). These findings thereby denote a strong relationship between knowledge and attitude. Although a strong association between knowledge and attitude was found, the sample size was a limitation in this study, therefore there is a possibility of a different outcome if there were more participants.

Liu et al. (2017) in Taiwan found that the caregiver's knowledge determines the oral health practice as there was a significant positive correlation between the higher the knowledge scores attained and better oral health practices (Liu et al., 2017). Despite the non-participation of 8 out of the 18 special schools in the study, the sample size of 503 caregivers proves to be a good representative sample thereby validating the findings. Bridges et al., (2013) in Hong Kong reported similar results of a strong relationship between the caregiver's oral health knowledge and the oral health status of the children (Bridges et al., 2013).

In addition, (Bhandary et al., 2013) in an assessment study of the awareness of caregivers of visually impaired children regarding their oral hygiene, lack of knowledge of dental disease and prevention among the caregivers was noted. The general importance of dental hygiene was also found to be very low (Bhandary et

al., 2013). As a result, this renders CSHCN prone to a higher risk of dental disease as their caregivers are not well versed with oral diseases and prevention strategies.

Furthermore, the KAP of the caregivers about oral health care at centres of intellectually disabled children in Saudi Arabia was assessed. It was reported that caregivers in the younger age group and education above high school levels attained higher knowledge scores (Abullais et al., 2020). However, the study had its limitations as it was conducted only in the southern region of Saudi Arabia and only at centres for the intellectually disabled (Abullais et al., 2020). This has an impact on the generalizability of the study findings. The assumption is that if the study included other regions and a larger sample size, then the results could have been significantly different (Abullais et al., 2020).

In a study on oral health KAP among caregivers in Malaysia, the findings indicated that even though the caregivers had sufficient oral health knowledge, their attitudes and practices were unsatisfactory (Halim et al., 2020). Hands-on sessions to demonstrate oral hygiene measures could assist in translating the knowledge into practice and develop better attitudes among caregivers towards their CSHCN. The literature reviewed above indicates that there is a relationship between oral KAP of caregivers and oral health of the CSHCN, however good oral health knowledge level is not translated to positive attitudes and practices.

The literature review above shows that there are disparities in the level of oral health KAP among caregivers. In some studies, all variables of KAP were good, however in others oral health knowledge and attitude levels among most caregivers were fair. In some instances, although knowledge levels were satisfactory, oral health attitudes and practices were poor.

Regarding factors associated with oral health KAP, age and the level of education played a role as outlined in the literature review above.

## 2.5 Rationale of the study

There was a paucity of African studies reported on KAP of caregivers of CSHCN, hence this study was conducted in Zimbabwe to add to the body of knowledge regarding the KAP of caregivers.

The study is significant because it is the first oral health study among caregivers of CSHCN in Zimbabwe according to the Disabled People's Organizations. In addition, in the literature reviewed, there are no studies yet on oral health among caregivers of CSHCN in Zimbabwe. The findings may be used as a benchmark on the oral health strategies or interventions to assist caregivers in the oral health of CSHCN.

## 2.6 Aims and Objectives

### Aims

1. To describe the caregivers' oral health knowledge, attitudes and practices towards CSHCN.

### Objectives

1. To determine the demographic profile of the caregivers in terms of, gender and socioeconomic status.
2. To assess the caregivers' oral health knowledge, attitudes and practices towards CSHCN.
3. To assess relationships between caregivers' level of education, demographic characteristics and oral health KAP and factors related to oral health practices.

## CHAPTER THREE

# METHODOLOGY

### 3.1 Study design

A quantitative cross-sectional study design was used.

### 3.2 Study population, study location, study period

The study population included caregivers of CSHCN who attended support group meetings in Harare Province, Zimbabwe over a period of three months, November 2022 – January 2023.

### 3.3 Sampling strategy

In Zimbabwe, there are Disabled People's Organizations (DPO's). Disabled People's Organisations are advocacy organizations which work at the regional, national and/or international levels to change policies and ensure equal rights and equal opportunities for people with disabilities (Khasnabis et al., 2010). The DPO's have outreach sites where support group meetings are held and these meetings are coordinated by representatives of the DPO's. The purpose of these meetings include, discussions on challenges faced by people with disabilities, training programs and support caregivers in the care of CSHCN as well as physiotherapy sessions for CSHCN among others. Caregivers of CSHCN attend these support group meetings as scheduled by the coordinators.

A list of Disabled People's organizations was obtained from National Association of Societies for the Care of the Handicapped (NASCOH) which is an umbrella body for organizations of and for people with disabilities in Zimbabwe. In addition, other DPO's were identified online. Contact details of all the DPO's under this umbrella organization were obtained as well as those that were found online. Only those that were reachable and granted permission to participate in the study were included. Out of the eighteen disability centres where permission was sought, permission was granted by fourteen centres, however only twelve centres were accessible. Therefore, convenience sampling was used. The inclusion and exclusion criteria below was used at the support group meetings.

### 3.4 Inclusion criteria

a. All caregivers who attended support group meetings were invited to participate in the study.

### 3.5 Exclusion criteria

a. Caregivers who were less than 18 years.

### 3.6 Sample size

A sample size of 384 caregivers was calculated. The sample size was determined by a formula used in sample size calculation in cross-sectional studies (Pourhoseingholi et al., 2013).

$n = z^2 pq/(me)^2$, n = sample size

p = 0.50 (50%) (assumed estimate of good level of knowledge), q = 0.50 (50%) (complement of “p”)

z = 1.96 (scores at 95% confidence interval)

me = 0.05 (5%, margin of error)

### 3.7 Data collection and study instrument

A modified self-administered questionnaire (SAQ) adapted from Alyafei et al. (2020) was used for data collection purposes (Appendix 4). It consisted of a demographics section where the following questions were asked; caregiver’s age, level of education, gender, employment status, the caregiver’s relationship with the child with special needs and the disability type of the child.

The second section on the questionnaire comprised of three sub-sections on oral health knowledge, attitude and practice questions. There were eleven, seven and five questions on KAP respectively. The type of questions were close ended questions, whereby the caregivers ticked the best possible answer best describing their response regarding their knowledge on oral health in the box; either “yes”, “no” or “I don’t know” for the oral health knowledge and attitude questions and either “yes” or “no” for the oral health practice questions. The questionnaire was in the English language and a trained interpreter was present to provide clarification to the caregivers. The caregivers were also encouraged to ask questions if they

did not understand. The questionnaires were distributed at the support group meetings.

### 3.8 Data Analysis

Data from each questionnaire was entered into excel and analyzed using Stata data analysis software (V.16, Stata Corp, College Station, Texas, USA). Independent variables were age, gender, level of education and employment status. Dependent variables were knowledge, attitude and practice levels. Normality of continuous variables was tested by Shapiro-Wilk test.

Knowledge, attitude and practice were modelled as continuous outcomes derived from each response in the questionnaire. There were 11 questions on oral health knowledge, 7 questions on attitude and 6 questions on practices. The coding system for the responses was as follows; a “yes” response was coded as “1”, a no response was coded as 0 and an “I don’t know” response was coded as 2. A correct answer was awarded 1 point and an incorrect answer was awarded 0. “I don’t know” responses were included in the calculation of the scores. The following scoring system was adopted for categorizing the level of oral health KAP.

Scoring system

Oral health knowledge score; good: 8-11, fair: 5-7, poor: 0-4

Oral health attitude score; good: 5-7, fair: 3-4, poor: 0-2

Oral health practice score: good: 5-6, fair:3-4, poor: 0-2

A total score was obtained in each category and percentages were calculated. Good oral health KAP; 71%$^{+}$, 41-70% fair and 0-40% poor.

The two-sample t test and ANOVA were used to compare means of caregivers’ KAP of independent groups.

Descriptive data was presented as frequencies and percentages for categorical variables and as means and standard deviation for continuous variables.

Multiple linear regression models were used to assess the continuous outcome (scores) and multivariate logistic regression was used to assess binary outcomes

(yes/no) for the assessment of the caregivers' oral health practice and demographics.

Multiple linear regression model was used to assess the association between caregivers' oral health knowledge, attitude, practice and demographic characteristics. Only variables with $p<0.15$ in the univariate model were included in the multiple linear and and multivariate logistic regression models.

Apriori variables such as age, gender, education level, knowledge and attitude were selected for multivariate logistic models. All variables with $p<0.05$ were considered statistically significant.

### 3.9 Ethical Considerations

Prior to commencing the study, permission letters were issued by the relevant bodies in Zimbabwe and South Africa. The Disabled People's Organisations issued permission letters to access the support group meeting centres and the participants for the data collection to take place. Thereafter, ethical approval was sought from and granted by the Medical Research Council of Zimbabwe (MRCZ) (Appendix 1) and finally the Human Research Ethics Committee (MEDICAL) (HREC-M) (Appendix 2) approved the study. MRCZ/B/2383 and HREC – M 220525 respectively.

The participants were given a Participant Information Sheet (PIS) outlining the details of the research and Informed Consent Form (ICF) (Appendix 3) prior to completion of the SAQ (Appendix 4). No names were appearing on the questionnaires to ensure anonymity and confidentiality of the participants.

### 3.10 Budget

The research was self-sponsored.

| **Expense** | **Amount (ZAR)** |
|---|---|
| Printing articles, questionnaires, consent and information sheets, final report, binding | 7000.00 |
| Medical Research Council Fees | 950.00 |
| Transport costs to data collection sites | 4320.00 |
| Interpreter | 5000.00 |
| Refreshments | 2720.00 |
| **Total** | 19 990.00 |

## CHAPTER FOUR

# RESULTS

### 4.1 Response Rate

Out of the eighteen disability centres where permission was sought, permission was granted by fourteen centres however data was collected at twelve centres which were accessible. Out of the 384 calculated sample size, 302 participants completed the SAQ, however 295 participants met the criteria and fully completed the SAQ. The response rate was therefore 76.8% (n=295).

### 4.2 Demographics

These include age, gender, caregivers' relationship with the child, child's disability, level of education and employment status. One third (33.6%) of the caregivers belonged to the 31-40 years old category and almost ninety percent (89.2%) of the caregivers were female. Nearly three quarters (72.5%) of the caregivers were the mothers of CSHCN and almost half (45.8%) of the caregivers were taking care of children with cerebral palsy. A quarter (25.8%) of the children had blindness, deafness, mental retardation, hydrocephalus, delayed development, spina bifida, mutism, attention deficit hyperactivity disorder and sickle cell anaemia. Employed caregivers were slightly lower than half (46.8%) of the study participants. The demographics of the caregivers are summarised in table 4.1 below.

**Table 4.1** Demographics of Caregivers

| Variable | Category | n=295 n (%) |
|---|---|---|
| **1. Age (years)** | 18-30 | 55 (18.6) |
| | 31-40 | 99 (33.6) |
| | 41-50 | 77 (26.1) |
| | 51+ | 64 (21.7) |
| **2. Gender** | Female | 263 (89.2) |
| | Male | 32 (10.8) |
| **3. Relationship with the child** | Mother | 214 (72.5) |
| | Father | 17 (5.8) |
| | Legal guardian | 25 (8.5) |
| | Other | 39 (13.2) |
| **4. Disability of the child** | Down syndrome | 53 (18.0) |
| | Cerebral palsy | 135 (45.8) |
| | Autism | 19 (6.4) |
| | Epilepsy | 12 (4.1) |
| | Other | 76 (25.8) |
| **5. Level of Education** | No school | 13 (4.4) |
| | Primary school | 60 (20.3) |
| | High school | 182 (61.7) |
| | College | 22 (7.5) |
| | University | 18 (6.1) |
| **6. Employment Status** | Employed | 138 (46.8) |
| | Not employed | 157 (53.2) |

### 4.3 Caregiver's Oral health knowledge responses

Almost two-thirds (n=190, 64.4%) of the caregivers were aware that general health can be affected by oral health. The majority, (n=232,78.6%) indicated that inadequate tooth brushing could cause tooth decay. Regarding the use of fluoride, (n= 182, 61.7%) indicated that not using toothpaste with fluoride could result in tooth decay. However, regarding whether syrup medicine can cause tooth decay, slightly over forty percent (n=130, 44.1%) of the caregivers lacked knowledge on this.

Almost 70% (69.8%, n=206) of the caregivers knew that dental plaque could cause tooth decay and almost half (n=147, 49.8%) of the caregivers indicated that tooth decay can be a consequence of lack of regular dental check-ups. Over three quarters (n=234, 79.3%) of the caregivers, knew that lack of brushing after eating sweets could cause tooth decay and almost half (n=141, 47.8%) of the caregivers knew that holding food in the mouth for a long time can cause tooth decay. Only 78 (26.4%) of caregivers knew that problems in milk teeth could affect permanent teeth, and only a few 58 (19.7%) of the caregivers were aware that modified tooth cleaning aids are available for people with disabilities. The caregivers' responses to the knowledge questions are outlined in Table 4.2 below.

**Table 4.2** Caregivers' oral health knowledge responses

| Question | Yes n (%) | No n (%) | I Don't know n (%) |
|---|---|---|---|
| 1. Does oral health affect general health? | 190 (64.4) | 62 (21.0) | 43 (14.6) |
| 2. Does inadequate tooth-brushing cause tooth decay? | 232 (78.6) | 34 (11.5) | 29 (9.8) |
| 3. Tooth decay is caused by not using toothpaste with fluoride? | 182 (61.7) | 65 (22.0) | 48 (16.3) |
| 4. Is tooth decay caused by sweet and acidic food? | 228 (77.3) | 30 (10.2) | 37 (12.5) |
| 5. Can syrup medicine cause tooth decay? | 83 (28.1) | 130 (44.1) | 82 (27.8) |
| 6. Does dental plaque cause tooth decay? | 206 (69.8) | 45 (15.3) | 44 (14.9) |
| 7. Does lack of regular check-ups cause tooth decay? | 147 (49.8) | 93 (31.5) | 55 (18.6) |
| 8. Does lack of brushing after eating sweets cause tooth decay | 234 (79.3) | 34 (11.5) | 27 (9.2) |
| 9. Does holding food in the mouth for a long-time cause tooth decay | 141 (47.8) | 91 (30.8) | 63 (21.4) |
| 10. Can problems in milk teeth affect permanent teeth | 78 (26.4) | 115 (39.0) | 102 (34.6) |
| 11. Are modified tooth cleaning aids available for people with disabilities | 58 (19.7) | 100 (33.9) | 137 (46.4) |

### 4.3.1 Overall distribution of the caregiver's level of oral health knowledge

Forty-five percent (n = 134) of the participants had fair oral health knowledge and almost a quarter (24.1%, n = 71) had poor oral health knowledge and 30.5% (n=90) had good oral health knowledge. The overall distribution of the caregiver's level of oral health knowledge is illustrated in figure 4.1 below.

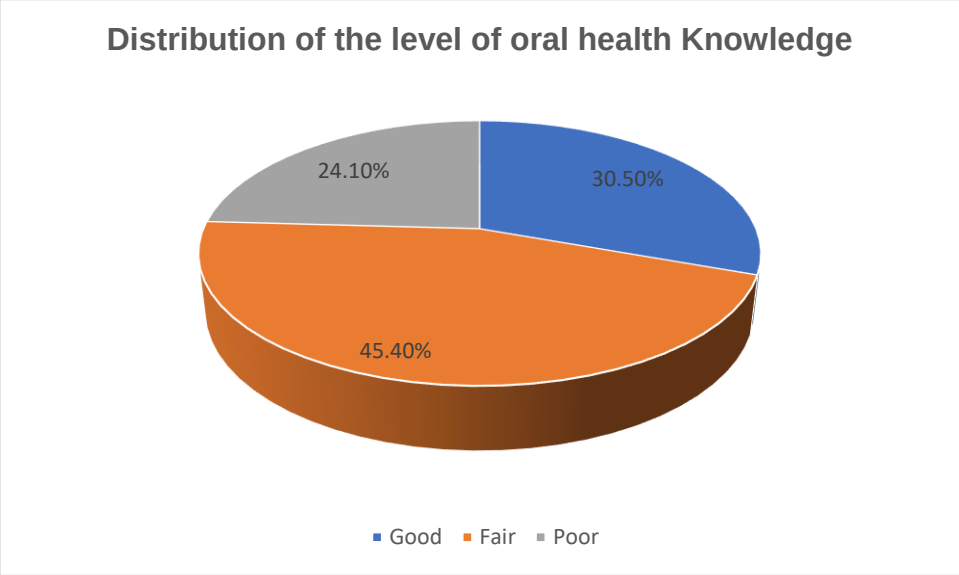


**Figure 4.1** Level of knowledge distribution among caregivers

### 4.3.2 Distribution of mean knowledge scores with respect to demographics

There was a statistically significant association between the mean oral health knowledge of the caregivers and the educational level (p=0.001). Whereas, the oral health mean knowledge of the caregivers and age, gender and employment status were not significant as outlined in table 4.3 below.

**Table 4.3** Distribution of mean knowledge with respect to demographics

| **Characteristic** | **Knowledge Mean (SD)** | **p-value** |
|---|---|---|
| **Age (years)** | | 0.094 |
| 18-30 | 5.8±2.41 | |
| 31-40 | 5.67±2.35 | |
| 41-50 | 6.43±2.34 | |
| 51+ | 6.33±2.13 | |
| **Gender** | | 0.380 |
| Female | 5.99±2.34 | |
| Male | 6.38±2.23 | |
| **Education level** | | 0.001* |
| No School | 6.62±2.53 | |
| Primary School | 5.40±2.32 | |
| High School | 5.97±2.31 | |
| College | 6.41±1.74 | |
| University | 7.87±2.08 | |
| **Employment Status** | | 0.180 |
| Employed | 6.22 ±2.37 | |
| Not employed | 5.86 ±2.28 | |
| **Significant *p<0.05** | | |

### 4.4 Caregiver's Oral health attitude responses

This section focuses on the caregiver's oral health attitude, distribution, and related factors.

Assessment of the caregiver's attitude revealed that the caregiver's generally had a good attitude towards oral health. The majority of the caregivers gave positive responses regarding the fact the child's tooth decay can be prevented (n=207, 70.2%) and gum disease (n=210,71.2%). In addition, most caregivers also indicated that treatment of both tooth decay (n=204, 69.2%) and gum (n= 244, 82.7%) disease was possible. Regarding the importance of cleaning the children's teeth more than once daily, positive responses were highlighted as well as the fact that cleaning the child's teeth more than once daily was necessary as well as changing the toothbrush every three months or when the bristles fray. Table 4.4 below summaries the caregivers' responses to the oral health attitude questions.

**Table 4.4** Caregiver Oral Health Attitude Responses

| Question | Yes n (%) | No n (%) | I don't know n (%) |
|---|---|---|---|
| 1. Do you think it is possible to prevent the child's tooth decay? | 207 (70.2) | 38 (12.9) | 50 (16.9) |
| 2. Do you think it is possible to prevent the child's gum disease? | 210 (71.2) | 28 (9.5) | 57 (19.3) |
| 3. Do you think it is possible to treat the child's tooth decay? | 204 (69.2) | 44 (14.9) | 47 (15.9) |
| 4. Do you think it is possible to treat the child's gum disease? | 244 (82.7) | 12 (4.1) | 39 (13.2) |
| 5. Do you think it is important to clean the child's teeth more than once daily? | 244 (82.7) | 38 (12.9) | 13 (14.4) |
| 6. Do you think it is necessary to change the tooth brush every three months or when the bristles fall apart? | 260 (88.1) | 19 (6.4) | 16 (5.4) |
| 7. Do you think buying a toothbrush is necessary? | 281 (95.3) | 9 (3.1) | 5 (1.7) |

### 4.4.1 Overall distribution of the caregiver's oral health attitude

The majority (79.7%, n = 235) had good oral health attitude, (14.9%, n = 44) had a fair oral health attitude and 5.4% (n=16) had a poor oral health attitude illustrated in Figure 4.2 below.

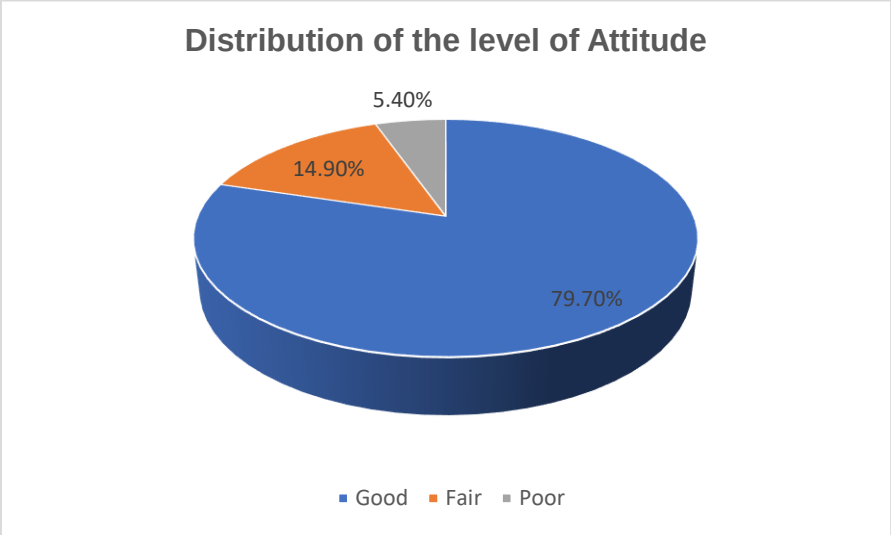


**Figure 4.2** Caregivers Oral Health Attitude distribution

### 4.4.2 Distribution of mean attitude scores with respect to demographics

There was a statistically significant association between the mean oral health attitude and level of education and employed caregivers, (p = 0.001) and (p=0.003) respectively. Table 4.5 below summarises the distribution of mean attitude with respect to demographics.

**Table 4.5** Distribution of mean attitude scores with respect to demographics.

| Characteristic | Attitude Mean (SD) | p-value |
|---|---|---|
| **Age (years)** | | 0.770 |
| 18-30 | 5.55±1.45 | |
| 31-40 | 5.49 ± 1.39 | |
| 41-50 | 5.73 ±1.49 | |
| $51^{+}$ | 5.63 ±1.73 | |
| **Gender** | | 1.000 |
| Female | 5.59 ±1.48 | |
| Male | 5.59 ± 1.66 | |
| **Education level** | | 0.001* |
| No School | 4.23 ±1.83 | |
| Primary School | 4.98 ±1.80 | |
| High School | 5.71 ±1.34 | |
| College | 6.05 ±1.05 | |
| University | 6.83 ±0.51 | |
| **Employment** | | 0.003* |
| Employed | 5.87 ± 1.37 | |
| Not employed | 5.35 ± 1.57 | |
| ***p<0.05 Statistically significant** | | |

### 4.5 Caregiver's Oral health practices results

This section focuses on the oral health practices distribution and distribution of mean scores with respect to demographics.

Slightly more than three quarters (n=225,76.3%) of the caregivers checked the children's teeth regularly. Almost a quarter (n=70, 23.7%) of the caregivers did not check the children's teeth regularly, and out of these 37(12.5%) checked the children's teeth only when they were in pain. Just over a quarter (n=79, 26.8) of the caregivers had taken the children to the dentist, however only 34 (11.5%) took the children to the dentist every six months. Ninety percent (n=267) of the caregivers used toothpaste to clean the children's teeth and out of these just over three quarters (77.6%, n=229) used toothpaste with fluoride to clean the children's teeth. Table 4.6 below summarizes the caregiver's oral health practices towards CSHCN.

**Table 4.6** Caregiver's oral health practice responses

| **Question** | **Yes**<br>**n (%)** | **No**<br>**n (%)** |
|---|---|---|
| 1. Do you check the child's teeth regularly? | 225 (76.3) | 70 (23.7) |
| 2. Do you check the child's teeth only when s/he is in pain? | 37 (12.5) | 258 (87.5) |
| 3. Have you taken the child to the dentist before? | 79 (26.8) | 216 (73.2) |
| 4. Do you take the child to the dentist every six months? | 34 (11.5) | 261 (88.5) |
| 5. Do you use toothpaste to clean the child's teeth? | 267 (90.5) | 28 (9.5) |
| 6. Do you use toothpaste with fluoride to clean the child's teeth | 229 (77.6) | 66 (22.4) |

### 4.5.1 Distribution of the caregiver's oral health practices

Sixty two percent (n=183), 27.5% (n=81), 10.5% (n=31) of the participants had fair, poor and good oral health practices respectively. Figure 4.4 below illustrates the distribution of the caregiver's oral health practices.

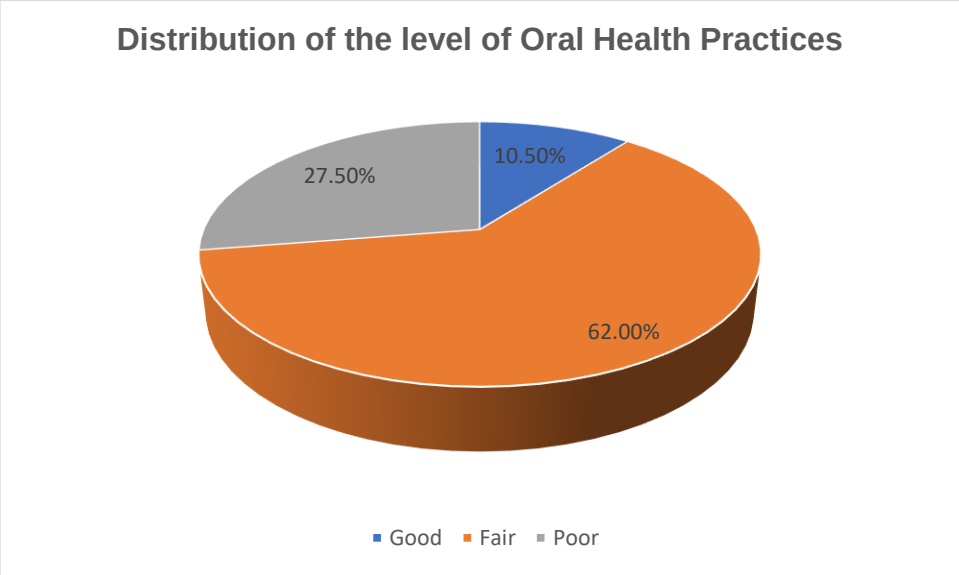


**Figure 4.3** Caregiver's Oral health practices distribution

### 4.5.2 Distribution of mean practice scores with respect to demographics

There was an association between the mean oral health practice scores with respect to age, gender, educational level and employment status, however there was no statistical significance as shown in table 4.7 below.

**Table 4.7** Distribution of mean practice scores with respect to demographics

| Characteristic | Practice Mean (SD) | p-value |
|---|---|---|
| **Age (years)** | | 0.540 |
| 18-30 | 2.85±1.11 | |
| 31-40 | 2.93 ±1.10 | |
| 41-50 | 3.10 ±1.02 | |
| 51+ | 2.89 ±1.14 | |
| **Gender** | | 0.340 |
| Female | 2.93 ±1.11 | |
| Male | 3.13 ± 0.94 | |
| **Education level** | | 0.870 |
| No School | 2.92 ±1.44 | |
| Primary School | 2.90 ±1.02 | |
| High School | 2.93 ±1.13 | |
| College | 3.09 ±1.11 | |
| University | 3.17±0.62 | |
| **Employment** | | 0.060 |
| Employed | 3.08 ± 1.13 | |
| Not employed | 2.84 ± 1.05 | |

### 4.5.3 Analysis of factors related to caregivers KAP.

Multivariate logistic regression models were used for analysis of factors related to caregiver's oral health practices. A summary of the results is outlined in Table 4.8 below.

**Table 4.8** Multivariate logistic regression of analysis of factors related to caregivers' oral health practice towards children with special health care needs.

| Variable | Model A | | Model B | | Model C | |
|---|---|---|---|---|---|---|
| | **AOR(95%CI)** | **p value** | **AOR(95%CI)** | **p value** | **AOR(95%CI)** | **P value** |
| **Age (years)** | | | | | | |
| 18-30 | reference | | reference | | Reference | |
| 31-40 | 0.57 (0.24-1.39) | 0.220 | 1.35(0.45-4.11) | 0.595 | 2.14(0.96-4.74) | 0.061 |
| 41-50 | 0.79 (0.31-2.02) | 0.624 | 1.03(0.32-3.26) | 0.961 | 2.48(1.02-6.00) | 0.045* |
| 51+ | 0.27(0.11-0.67) | 0.005* | 1.94(0.64-5.92) | 0.243 | 1.83(0.72-4.67) | 0.205 |
| **Gender** | | | | | | |
| Female | reference | | reference | | Reference | |
| Male | 0.60(0.26-1.40) | 0.236 | 1,75(0.64-4.83) | 0.277 | 2.56(0.80-8.22) | 0.114 |
| **Education level** | | | | | | |
| No/primary | reference | | reference | | Reference | |
| High school | 1.83(0.82-4.08) | 0.138 | 0.35(0.14-0.87) | 0.024* | 0.47(0.15-1.46) | 0.193 |
| College/ University | 1.97(0.76-5.11) | 0.161 | 0.49(0.16-1.46) | 0.199 | 0.57(0.16-2.03) | 0.388 |
| **Knowledge** | 1.00(0.88-1.14) | 0.956 | 1.08(0.91-1.28) | 0.383 | 1.19(1.04-1.36) | 0.009** |
| **Attitude** | 1.09(0.90-1.33) | 0.381 | 1.01(0.77-1.32) | 0.924 | 1.29(1.06-1.57) | 0.011* |

**Significant: *p<0.05, **p<0.01, ***p<0.001. AOR was adjusted caregivers' gender, age and educational level; Model A: Regular check of child's teeth (yes/no); Model B: Check of child's teeth when s/he has a toothache (yes/no); Model C: do you use toothpaste with fluoride (yes/no . OR>1 more likely. OR<1 less likely**

These factors were age, gender, level of education, oral health knowledge and attitude. The models revealed that, older caregivers (51+ years) were less likely to do regular check-ups of the children's teeth as compared to those aged between 18-30 years old (AOR: 0.27, 95% CI: 0.11-0.67).

In addition, caregivers who had high school education level checked the child's teeth regularly and not only when the child had a toothache compared to those with no education and those with primary school education (AOR:0.35, 95% CI:0.14-0.87).

Furthermore, caregivers aged 41-50 years were more likely to use tooth paste with fluoride as compared to those aged 18-30 years old (AOR: 2.48, 95% CI:1.02-6.00).

Regarding oral health knowledge and practice, for one-unit increase in knowledge, the odds of caregivers using toothpaste with fluoride to clean the child's teeth increase by 1.19 (95% CI: 1.04 -1.36). Similarly, for one-unit increase in oral health attitude, the odds of caregivers using toothpaste with fluoride to clean the child's teeth increase by 1.29 (95% CI: 1.06-1.57).

As per data analysis plan, multiple linear regression was used to assess the association between caregivers' KAP and demographic characteristics. The results are outlined in table 4.9 below.

**Table 4.9** Multiple linear regression models of the association between knowledge, attitude and practice, and caregivers' demographic profile.

| | Knowledge | | | Attitude | | | Practice | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variable** | Unadjusted model | Adjusted model | p-value | Unadjusted model | Adjusted model | p-value | Unadjusted model | Adjusted model | p- value |
| **Age (years)** | | | | | | | | | |
| 18-30 | Reference | reference | | reference | | | Reference | | |
| 31-40 | -0.143(-0.91-0.62) | 0.04(0.68-0.77) | 0.904 | (-0.05(-0.55-0.45) | | | 0.07 (-0.29-0.44) | | |
| 41-50 | 0.63(-0.18-1.43) | 0.58(-0.17-1.34) | 0.131 | 0.18 (-0.34-0.71) | | | 0.25 (-0.13-0.63) | | |
| 51+ | 0.53(-0.31-1.37) | 0.53(-0.28-1.34) | 0.202 | 0.08 (-0.47-0.62) | | | 0.04 (-0.36-0.43) | | |
| **Gender** | | | | | | | | | |
| Female | Reference | | | reference | | | Reference | | |
| Male | 0.39 (-0.47-1.24) | | | 0.001(-0.55-0.55) | | | 0.19(-0.21-0.60) | | |
| **Relationship with child** | | | | | | | | | |
| Parents | Reference | reference | | reference | Reference | | Reference | | |
| Legal guardian | 0.92(0.28-1.56)** | 0.57 (-0.05-1.19) | 0.072 | 0.36(-0.06-0.78) | 0.03(-0.36-0.42) | 0.085 | 0.20 (-0.10-0.50) | | |
| **Education level** | | | | | | | | | |
| No/primary | Reference | reference | | reference | Reference | | Reference | | |
| High school | 0.35(-0.28-0.98) | 0.02(-0.61-0.66) | 0.942 | 0.86(0.48-1.25)*** | 0.80(0.43-1.17) | <0.001 | 0.03(-0.27-0.33) | -0.27-0.33) | |
| College/university | 1.46(0.57-2.35)*** | 0.64(-0.27-1.55) | 0.165 | 1.55(1.00-2.10)*** | 1.26(0.72-1.80) | <0.001 | 0.22(-0.20-0.64) | | |
| **Attitude** | 0.62(0.47-0.78)*** | 0.44(0.26-0.61) | <0.001 | 0.29(0.22-0.36)*** | 0.18(0.11-0.25) | <0.001 | 0.12(0.07-0.18) | 0.09 (0.03-0.14) | 0.003*** |
| **Practice** | 0.56 (0.32-0.79) *** | 0.25(0.02-0.48) | 0.036 | 0.38(0.23-0.54)*** | 0.11 (-0.03-0.26) | 0.128 | 0.18(0.11-0.26) | 0.13(0.05-0.21) | 0.002*** |

**Significant: *p<0.05, **p<0.01, ***p<0.001**

The factors associated with the caregivers' practice were their knowledge and attitude. For a unit increase in knowledge, the caregivers' oral health practice had an average increase of 0.09 (95% CI: 0.03-0.14, $p<0.0001$) and also a unit increase in attitude had a mean increase of 0.13 (95% CI: 0.05-0.21, $p<0.001$) on the caregivers' oral health practice.

Furthermore, multiple linear regression models revealed that oral health practice, oral health related knowledge and attitude have a strong relationship. The factors associated with caregivers' attitude was their knowledge and educational level. For a unit increase in attitude, the caregiver's knowledge increased by a mean of 0.62, $p<0.001$.

Moreover, as the level of education level increased, the attitude of the caregivers also increased, high school [$\beta = 0.86$ (95% CI: 0.48-1.25)] and college/university [$\beta = 1.55$ (95% CI: 1.00-2.10)].

## CHAPTER FIVE

# DISCUSSION

This study sought to describe the caregivers' oral health knowledge, attitudes and practices towards CSHCN and had three objectives. Firstly, to determine the caregivers' demographic profile in terms of age, gender and socioeconomic status. Secondly, to assess the caregivers' oral health knowledge, attitudes and practices towards CSHCN. Lastly, to assess relationships between caregivers' level of education, demographic characteristics and oral health KAP and factors related to oral health practices.

The study enrolled 295 caregivers. The majority of the caregivers were female and mothers constituted the majority of the study participants. Most of the participants belonged to the 31 – 40 years age category. Most of the caregivers had good oral health attitude, however their knowledge and practices were fair. Factors associated with caregivers' attitude were their knowledge and level of education, and the caregivers' practices were associated with knowledge and attitude.

The majority of the caregivers were female (n=263, 89.2%). This finding was also reported in other studies, where 74.75%, 64.5%, 73.2% and 73.5% of the caregivers in Taiwan, Saudi Arabia, Malaysia, and Qatar respectively were female, (Al-Khalifa and Alfaraj, 2021; Alyafei et al., 2020; Halim et al., 2020; Liu et al., 2017b). These findings clearly highlight that females are usually the primary caregivers of CSHCN. However, this contrasts with another study in Saudi Arabia where more male caregivers (53%) participated in the study, (Abullais et al., 2020). This finding could be attributed to cultural or religious reasons or familial practices in the Southern region of Saudi Arabia.

Mothers constituted the majority (n=214, 72.5%) of the study participants and this was similar to a study in Qatar, (Alyafei *et al*., 2020) where 83% of the participants were mothers. This result highlights the fact that caregivers of CSHCN are mostly mothers which is indicative that mothers play a pivotal role as the primary caregiver. However, in other studies, the caregiver's relationship with the CSHCN was not assessed, (Abullais et al., 2020b; Halim et al., 2020), and in other studies only mothers were invited to participate, (Krishnan et al., 2019), therefore a comparison could not be made.

In this study, the highest number of the participants were in the 31-40 years age range (33.6%), compared to other studies where their highest number of participants were in the ≥36 years age group, 30-39 years age group and 35-44 years age group respectively (Abullais et al., 2020; Al-Khalifa and Alfaraj, 2021; Liu et al., 2017).

In terms of the level of education, in this study, almost two thirds (61.7%) of the caregivers were educated up to high school level, in contrast to a study in Saudi Arabia where only 36% of the caregivers had attained high school education, (Al-Khalifa and Alfaraj, 2021). In the 'no school category', in this study only 4.4% had no school whereas the number of participants with no formal education were higher in Qatar and India where 18% and 47.8% of the caregivers respectively had no formal education (Alyafei et al., 2020; Krishnan et al., 2019).

Regarding employment, in this study, just below fifty percent (46.8%) of the caregivers were employed. However, this variable was not assessed in the studies reviewed. In this study, employment had an association with the caregivers' oral health attitude, whereby employed caregivers had a higher mean attitude compared to unemployed caregivers.

The majority of the caregivers, (45.8%) were taking care of children with cerebral palsy. This finding is in line with the prevalence of cerebral palsy in Zimbabwe estimated to be at 1.55 per 1000 and 3.3 per 1000 in rural and urban areas respectively, (Finkenflugel et al., 1996). However, this contrasts with a study in India whereby nearly one third (28.9%) of the CSHCN had cerebral palsy and the majority of the CSHCN had learning disabilities (40.5%) such as autism and attention hyperactivity disorder, (Krishnan et al., 2019).

Regarding caregivers' oral health knowledge, generally, the results in this study highlighted that most caregivers of CSHCN in Harare, Zimbabwe had fair oral health knowledge. This outcome could have been due to oral health campaigns on radio during the world oral health day commemorations or via social media where the dental association shares oral health information. This outcome is similar to a study in Saudi Arabia, where the majority of the caregivers also had fair oral health knowledge, (Albullais et al., 2020). However, good oral health knowledge and

awareness was noted in Qatar and in a different study in Saudi Arabia, (Alfayei et al., 2020; Al-Khalifa & Alfaraj, 2021).

Good oral health knowledge and awareness noted in the Qatar study could have been as a result of the caregivers' level of education since 82% had some form of education. In contrast, unsatisfactory and poor oral health knowledge was found in India, (Bhandary et al., 2013; Krishnan et al., 2019). This finding was attributed to the fact that, caregivers were apathetic towards oral health and perhaps prioritizing other medical conditions the CSHCN had. In addition, the importance of maintenance of good oral health and dental treatment needs may not be well understood by the caregivers of CSHCN, (Bhandary et al., 2013).

In this study, the majority of the caregivers were aware that general health can be affected by oral health and this outcome is similar to a study in Taiwan, Alyafei et al., (2020) and also in Qatif, where caregivers' perception regarding oral health and overall health was assessed, (Alalshaikh et al., 2022). However, in a study by Krishnan et al., (2019) most of the caregivers had no knowledge regarding this. Knowledge on whether general health can be affected by oral health could have been obtained from various sources such as television, internet, books or from other people and perhaps from general discussions on health at the support group meetings.

In addition, most caregivers had knowledge on whether inadequate tooth brushing could cause tooth decay, this result was also found in a Qatar study, (Alyafei et al., 2020). Regarding the question on whether not using toothpaste with fluoride could cause tooth decay, in this study, the majority of the caregivers had knowledge on this, whereas, in other studies most of the caregivers were not aware, (Alyafei et al., 2020; Krishnan et al., 2019). Knowledge on the above could be attributed to access to information on oral health information via different social media platforms.

Whereas in a study in India, regarding fluoride, none of the caregivers were knowledgeable on fluoride therapies in the prevention of dental caries, (Bhandary et al., 2013). This finding could be due to the fact that information on fluoride as a preventative measure is not widely available.

Concerning sweet and acidic foods as causative agents of tooth decay, most caregivers knew that they are causative agents. However, in a Malaysian study, all caregivers were aware of this, (Halim et al., 2020). The reason for being knowledgeable on this aspect could be due to oral health information being available during oral health campaigns when information is shared in newspapers or social media platforms.

The question on whether medicines such as syrups could cause tooth decay, most caregivers had no knowledge on this and a similar outcome was also reported in another study, (Alyafei et al., 2020). In terms of dental plaque being a causative agent of tooth decay, roughly 70% of caregivers in this study were knowledgeable on this aspect, and this finding is consistent with a published study in Qatar where almost a similar percentage of caregivers were aware of this (Alyafei et al., 2020) whereas in an Indian study, only 54.7% of the caregivers were aware of this, (Bhandary et al., 2013). The question on whether lack of regular check-ups could cause tooth decay, almost 50% of the caregivers were aware, however in a similar study, almost three quarters had knowledge on this, (Alyafei et al., 2020).

Moreover, in the same study in Qatar, almost three quarters of the caregivers were aware of the fact that holding food in the mouth for a long-time could cause tooth decay compared to the outcome in this study where almost 50% had knowledge on this, (Alyafei et al., 2020). In this study, roughly three quarters of the caregivers were not knowledgeable on whether problems in milk teeth could affect permanent teeth, whereas in Qatar, the majority of the caregivers were knowledgeable, (Alyafei et al., 2020).

Regarding, the availability of modified cleaning aids for people with disabilities in this study, most caregivers were not aware of these, whereas in a similar study it was reported that just over three quarters of the caregivers were aware, (Alyafei et al., 2020).

In terms of oral health attitude, good oral health attitude was noted in this study and this finding was also found in Qatar and Taiwan, (Alfayei et al., 2020; Liu et al., 2017). However, in India and Malaysia, poor and unsatisfactory oral health attitudes were noted respectively, (Krishnan et al., 2019; Halim et al., 2020).

Regarding oral health practices towards CSHCN, most studies revealed that the oral health practices were good, (Alfayei et al., 2020; Al-Khalifa et al., 2021., Abullais et al., 2020; Liu et al., 2017). However, in this study the caregivers' oral health practices towards CSHCN were fair.

In this study, it was noted that the majority (73.2%) of the caregivers had not taken the child to the dentist before and in a similar study 42.2% of the caregivers had never taken the child to the dentist as well, (Bhandary et al., 2013). This finding could be a result of caregivers not being aware of the importance of good oral health and the importance of dental visits or perhaps prioritizing disability care more than oral health care.

This study also explored on relationships between oral health knowledge, attitude, practices and demographic characteristics, that is age, gender, and the caregivers level of education. A number of associations were actually noted, for example, older caregivers aged 41-50 and 51+ age categories had higher oral health mean knowledge scores as compared to younger caregivers aged 40 or less years, even though no statistically significant difference was observed (p=0.094). Probably this is attributed to experience in the older age group regarding oral health knowledge. This outcome is similar to a study in India whereby caregivers in the 41-50 age group had higher mean knowledge scores, (Krishnan et al., 2019).

Similarly, in a study in Taiwan, it was reported that the older age group had better oral health knowledge whereas the younger caregivers had limited oral health knowledge, (Liu et al., 2017). However, in a study in Saudi Arabia it was noted the younger caregivers' oral health awareness was better although the outcome was not statistically significant (p=0.182), (Al-Khalifa & Alfaraj, 2021). This finding could be attributed to the younger caregivers having access to sources of oral health information and their ability to comprehend information provided by the dentists, (Al-Khalifa & Alfaraj, 2021).

Regarding the association between oral health knowledge and gender, although there were no statistically significant results in caregiver knowledge, in both genders oral health knowledge was comparable, (Al-Khalifa & Alfaraj, 2021). This

is in line with this study as there were no statistically significant results between the level of oral health knowledge and gender.

Results in this study revealed that caregivers with college/university education had higher mean knowledge compared to those with high school or lower (p=0.001). Similarly, caregivers with a higher level of education in India, Saudi Arabia and Taiwan also had higher mean knowledge, (Abullais et al., 2020b; Krishnan et al., 2019; Liu et al., 2017). A significant association between knowledge and level of education was noted, (Abullais et al., 2020b; Liu et al., 2017). Similarly, in Qatar, higher knowledge mean scores were noted in caregivers with better education and this finding was attributed to the fact that an increase in the level of education, could result in better understanding of the causes of oral diseases as these could have been learnt at school, (Alyafei et al., 2020).

According to (Al-Khalifa & Alfaraj, 2021), caregivers with high school education level had a better comprehension of the effect of fluoride than those without. However, caregiver education had no significant effect on any other aspect of awareness of dental health as there were no significant differences noted between those who did and did not complete high school or university (p=0.063), (Al-Khalifa & Alfaraj, 2021).

The results in this study indicated that, the factors associated with caregivers' oral health attitude was their knowledge and educational level. Similarly, in a study in Taiwan, the factor that had an association with oral health knowledge was the caregiver's level of education, (Liu et al., 2017). Moreover, oral health attitude was also associated with the caregiver's oral health knowledge, (Liu et al., 2017).

The results in this study demonstrated that caregivers with university education had a higher mean attitude compared to those caregivers with a lower education level, and the outcome was statistically significant. As the educational level increased, the oral health attitude of the caregivers also increased. This outcome was comparable to a study in India where mothers with a higher level of education also had better attitude scores when compared to mothers with lower educational qualifications, (Krishnan et al., 2019).

Concerning employment status of the caregivers and oral health attitude, an association was actually found in this study. Employed caregivers had a higher

mean attitude compared to unemployed caregivers (5.87 vs 5.35, p=0.003). This finding could be attributed to the discussions people may have at the work environment regarding health in general. Employed caregivers may also have better access to information at the work place and further have an influence on oral health attitude. In addition, an association was found between the caregiver's oral health attitude and practices. An increase in the oral health attitude, had a mean increase on the caregiver's oral health practice. This is an indicator that oral health attitude can determine oral health practices as concluded in a Taiwan study, (Liu et al., 2017).

# CHAPTER SIX

## LIMITATIONS, CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Limitations

The results of this study cannot be generalised as there were limitations in the sample size and the convenience sampling method used in this study as well as other factors.

Firstly, due to the COVID19 pandemic, some of the centres had not resumed public gatherings therefore, support group meetings were not being held and it is at these meetings that caregivers of CSHCN attend.

Secondly, some of the centres did not respond to the request to participate in the study. Therefore, without permission, data collection could not be done at some sites.

In addition, some of the centres who had granted permission had a poor turn out and some of the caregivers who attended the support group meetings did not consent to participate in the study, further affecting the sample size.

Moreover, some of the questionnaires were not fully completed and had to be excluded from the study as some of the demographic information was incomplete.

Furthermore, some of the caregivers may not be members of disabled people's organisations and have no access to support group meetings where data collection was taking place.

Therefore, the results cannot be generalised as the outcome could have been significantly different if there were more participants and permission granted by more centres.

### 6.2 Conclusions

In conclusion, it was found out that caregivers had fair oral health knowledge, good attitudes towards oral health and fair oral health practices towards CSHCN. Caregivers with a higher level of education had a better attitude towards oral health. Employed caregivers' oral health knowledge, attitude and practices were also better than unemployed caregivers. Regarding knowledge generally,

caregivers with tertiary education had higher oral health knowledge, attitude and practices compared to those with high school or lower.

Even though the study was not inclusive of all provinces in Zimbabwe, the findings may be used as a benchmark concerning the oral health strategies to assist caregivers in the oral health of CSHCN.

### 6.3 Recommendations

This section focuses on recommendations emanating from this study. The recommendations have been divided into three sub-sections, that is recommendations to the Disabled Peoples Organisation's, caregivers of CSHCN and dental professionals. Collective efforts among the three will have an impact in the general improvement of oral health KAP of caregivers in order to ensure that CSHCN oral health needs are met, and oral diseases are prevented where possible.

#### 6.3.1 Recommendations to Disabled People's Organisations

Disabled People's Organisations should invite dental professionals on a regular basis to the support group meetings. The dental professionals' role would be to educate caregivers of CSHCN on the importance of good oral health to ensure that caregivers of CSHCN's are well versed with good oral health practices to avoid preventable oral diseases where possible. This will improve oral health knowledge and practices among caregivers.

If resources allow, it would be ideal for coordinators of DPO's to consider having on site oral health facilities to cater for CSHCN, so that the caregivers can also bring the CSHCN to some of the support group meetings for oral health checks as it was noted in this research that the majority of caregivers had not taken the CSHCN to the dentist before. Perhaps an on-site dental facility would assist in alleviating this as there might be experiencing challenges in accessing dental facilities due to either financial or nonfinancial barriers.

In addition, the coordinators must find out the challenges that the caregivers have and support them.

Lastly, coordinators of DPO's can also liaise with dental health professional bodies to request for dental check-ups for CSHCN during the period when oral health campaigns are commemorated. This will assist as hands-on demonstrations on oral care can be done to improve the oral health practices of caregivers towards CSHCN.

### 6.3.2 Recommendations to the caregivers of CSHCN

Apart from focusing on the child's main disability, the caregivers should also pay attention to the oral health. General health can be affected by oral health therefore, caregivers should take the initiative to assist or supervise CSHCN with practicing good oral health habits such as brushing teeth twice daily, dental flossing after meals since they may have limitations because of their debilitating conditions.

In addition, those caregivers' who have better oral health knowledge and practices may share their knowledge and practices with other caregivers during support group meetings.

### 6.3.3 Recommendations to Dental Professionals

Dental professionals should also include caregivers of CSHCN and the CSHCN in outreach programs, as it was noted by some of the centres that dental professionals had never visited their centres for outreach programs. Focused oral health education to young, unemployed mothers especially in antenatal clinics for anticipatory guidance as part of primary prevention would have a positive impact in the oral health of CSHCN.

Moreover, dental professionals should also conduct research on a larger scale, in all provinces if possible, or dental screening on CSHCN. Research studies are to be conducted to gather baseline data on the oral health status of the CSHCN in Zimbabwe to inform policy makers in planning interventions to prevent oral diseases in this vulnerable population. This will greatly assist to have a better understanding on the prevalence of oral disease in CSHCN in Zimbabwe and identify any challenges or barriers that the caregivers and CSHCN face and find ways to alleviate these, as it was noted that this was the first time a dental professional had conducted research on oral health among caregivers of CSHCN at the centres visited.

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# Appendix 1: Ethical Approval from the Medical Research Council of Zimbabwe

Telephone: 08644073772/791193
E-mail: mrcz@mrcz.org.zw
Website: http://www.mrcz.org.zw

Medical Research Council of Zimbabwe
20 Cambridge Road
Avondale
Harare
Zimbabwe

**APPROVAL**

MRCZ/B/2383 **29 August, 2022**

**Vimbai Mashanda**
Block 2, Corner Burton and Princess Roads
Belvedere
**Harare**

**RE:-Caregivers' Oral Health_Knowledge. Attitudes and Practices Towards Children with Special Health Care Needs**

Thank you for the application för review of research activity that you submitted to the Medical Research Council of Zimbabwe (MRCZ). Please be advised that the Medical Research Council of Zimbabwe has **reviewed** and **approved** your application to conduct the above titled study.

This approval is based on the review and approval of the following documents that were submitted to MRCZ for review:

- Completed MRCZ 101 new application form
- Full Protocol
- English and Shona Informed Consent Forms
- Data collection tools

- **APPROVAL NUMBER** : **MRCZ/B/2383**

This number should be used on all correspondence, consent forms and documents as appropriate.

- **TYPE OF MEETING** **: EXPEDITED**
- **APPROVAL DATE** **: 29 August, 2022**
- **EXPIRATION DATE** **: 28 August, 2023**

After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the MRCZ offices should be submitted three months before the expiration date for continuing review.

- **SERIOUS ADVERSE EVENT REPORTING:** All serious problems having to do with subject safety must be reported to the Institutional Ethical Review Committee (IERC) as well as the MRCZ within 3 working days using standard forms obtainable from the MRCZ Offices or website.
- **MODIFICATIONS**: Prior MRCZ and IERC approval using standard forms obtainable from the MRCZ Offices is required before implementing any changes in the Protocol (including changes in the consent documents).
- **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the MRCZ using standard forms obtainable from the MRCZ Offices or website.
- **QUESTIONS**: Please contact the MRCZ on Telephone No. (0242)791193, 0864407377203 or by e-mail on mrcz@mrcz.org.zw

**Other**

- Please be reminded to send in copies of your research results for our records as well as for Health Research Database.
- You're also encouraged to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study.
- In addition to this approval, all clinical trials involving drugs, devices and biologics (including other studies focusing on registered drugs) require approval of Medicines Control Authority of Zimbabwe MCAZ) before commencement.

Yours Faithfully

MRCZ SECRETARIAT
FOR CHAIRPERSON
MEDICAL RESEARCH COUNCIL OF ZIMBABWE

MEDICAL RESEARCH COUNCIL OF ZIMBABWE
29 AUG 2022
APPROVED
20 CAMBRIDGE ROAD, AVONDALE, HARARE

**PROMOTING THE ETHICAL CONDUCT OF HEALTH RESEARCH**

## Appendix 2: Ethical Approval from the Human Research Ethics Committee (Medical)

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R49 Dr V Mashanda

**HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)**
**CLEARANCE CERTIFICATE NO. M220525**

| | |
|---|---|
| **NAME:** **(Principal Investigator)** | Dr V Mashanda |
| **DEPARTMENT:** | School of Oral Health Sciences<br>Department of Paediatric and Restorative Dentistry<br>Dental School<br>University |
| **PROJECT TITLE:** | Caregivers' oral health knowledge, attitudes and practices towards children with special health care needs in Harare Province, Zimbabwe |
| **DATE CONSIDERED:** | 2022/05/27 |
| **DECISION:** | Approved unconditionally |
| **CONDITIONS:** | |
| **NOTE:** | If contact information regarding student study participants is required, please contact the Registrars office - Nicoleen.Potgieter@wits ac.za0 |
| **SUPERVISOR:** | Drs C Malau and S Tootla |
| **APPROVED BY:** | Dr CB Penny, Chairperson, HREC (Medical) |
| **DATE OF APPROVAL:** | 2022/10/11 |

**This Clearance Certificate is valid for 5 years from the date of approval. An extension may be applied for.**

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**DECLARATION OF INVESTIGATORS**

TO be completed in duplicate and ONE COPY returned to the Research Office secretariat on the 3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report.** When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in May and therefore reports and re-certification will be due in the month of May each year. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).

Signature of Principal Investigator

26/10/2022
Date

**Appendix 3: Participant Information Sheet and Informed Consent Form**

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

***Research Title: CAREGIVER'S ORAL HEALTH KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS CHILDREN WITH SPECIAL HEALTH CARE NEEDS***

Principal Investigator: Dr. Vimbai Mashanda
Phone number(s) 0713211222, Email: 1561082@students.wits.ac.za

**What you should know about this research study:**

- We give you this consent so that you may read about the purpose, risks, and benefits of this research study.
- Routine care is based upon the best-known treatment and is provided with the main goal of helping the individual patient. The main goal of research studies is to gain knowledge that may help future patients.
- We cannot promise that this research will benefit you. Just like regular care, this research can have side effects that can be serious or minor.
- You have the right to refuse to take part or agree to take part now and change your mind later.
- Whatever you decide, it will not affect your regular care.
- Please review this consent form carefully. Ask any questions before you make a decision.
- Your participation is voluntary.

**PURPOSE**

You are being asked to participate in a research study of caregivers' oral health knowledge, attitudes, and practices towards children with special health care needs*.* The purpose of the study is to determine:

1. The demographic profile of the caregivers in terms of age, gender, and socioeconomic details,
2. To assess the caregivers' oral health knowledge, attitudes, and practices towards children with special healthcare needs.
3. To assess relationships between the caregivers' level of education, demographic characteristics and oral health knowledge, attitudes and oral health knowledge, attitudes and practices and factors related to oral health practices*.*

You were selected as a possible participant in this study because in most cases, caregivers' play a pivotal role in the maintenance of oral health of children with special health care needs since they may have limitations*.* The approximate number of participants from the Disabled People's Organisations in the study in Harare Province, Zimbabwe is 384.

**PROCEDURES AND DURATION**

If you decide to participate, you will answer a set of questions on the questionnaire. Questions on your age, gender, type of disability of the child, oral health knowledge, attitude and practices will be asked. Approximately twenty minutes of your time will be required**.**

**RISKS AND DISCOMFORTS**

There is no risk or discomfort if you decide to participate. However, in the event that and you become distressed during the completion of the questionnaire, please stop completing the questionnaire immediately and inform the principal investigator. If you require counselling services, please call the Friendship Bench on 0784 845 294 for free counselling.

**BENEFITS AND/OR COMPENSATION**

We cannot and do not guarantee or promise that you will receive any benefits from this study. However, the longer-term benefit is imparting oral health knowledge, attitudes and practices depending on the outcome of the study.

**CONFIDENTIALITY**

If you indicate your willingness to participate in this study by signing this document, we plan to write a research report which will be submitted to University of the Witwatersrand to fulfil the requirements of the master's degree and publish in an accredited journal. All information that is obtained in connection with this study is confidential and anonymous as no names will appear on the questionnaires.

**ADDITIONAL COSTS**

There will be no additional costs to the participant.

**IN THE EVENT OF INJURY**

There is no risk of injury by participating in this study.

**VOLUNTARY PARTICIPATION**

Participation in this study is voluntary. If you decide not to participate in this study, your decision will not affect your future relations with the Disabled People's Organization you are affiliated to. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty.

**ADDITIONAL ELEMENTS**

There will be no penalties if you decide to withdraw your participation.

**SIGNATURE PAGE**

***Research Title: CAREGIVER'S ORAL HEALTH KNOWLEDGE, ATTITUDES AND PRACTICES TOWARDS CHILDREN WITH SPECIAL HEALTH CARE NEEDS***

**OFFER TO ANSWER QUESTIONS**

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

**AUTHORIZATION**

You are making a decision whether or not to participate in this study. Your signature indicates that you have read and understood the information provided above, have had all your questions answered, and have decided to participate.

Name of Research Participant (please print) Date

Signature of Participant or legally authorized representative Time

**YOU WILL BE OFFERED A COPY OF THIS CONSENT FORM TO KEEP.**

If you have any questions concerning this study or consent form beyond those answered by the investigator, including questions about the research, your rights as a research participant or research-related injuries; or if you feel that you have been treated unfairly and would like to talk to someone other than a member of the research team, please feel free to contact the Medical Research Council of Zimbabwe (MRCZ) on telephone (04)791792 or (04) 791193 and cell phone lines 0784 956 128. The MRCZ Offices are located at the National Institute of Health Research premises at Corner Josiah Tongogara and Mazowe Avenue in Harare.

**Appendix 4: Questionnaire: Caregivers' Oral Health Knowledge, Attitude and Practices towards Children with Special Health Care Needs in Harare Province, Zimbabwe**




*Place a cross in the box that best describes your response.*

1. What is your Age? 18 -30 ☐ 31-40☐ 41-50☐ 51+☐
2. What is your gender? ☐Male ☐Female
3. What is your relationship to the child? ☐ Mother ☐Father ☐Legal guardian ☐Other (specify) _____
4. What is the disability of the child? ☐ Down's syndrome ☐Cerebral Palsy ☐Autism

☐Epilepsy ☐Other (specify) _____

5. Socioeconomic details
   a) What is your level of education?

☐No school ☐Primary school ☐High School ☐College/ ☐University ☐Other, specify_____

   b) Employment status

☐ Yes ☐ No ☐ Self-employed ☐ Other, please explain_____

**PARENT/CARE-GIVER KNOWLEDGE**

*Place a cross in the box that best describes your response.*

1. Does oral health affect general health? ☐ Yes ☐No ☐Don't know
2. Does inadequate tooth brushing cause tooth decay? ☐ Yes ☐No ☐Don't know
3. Tooth decay is caused by not using tooth paste with fluoride? ☐ Yes ☐No ☐Don't know
4. Is tooth decay caused by sweet and acidic food? ☐ Yes ☐No ☐Don't know
5. Can syrup medicine cause tooth decay? ☐ Yes ☐No ☐Don't know
6. Does dental plaque cause tooth decay? ☐ Yes ☐No ☐Don't know
7. Does lack of regular dental check-ups cause tooth decay? ☐ Yes ☐No ☐Don't know
8. Does lack of brushing after eating sweets cause tooth decay? ☐ Yes ☐No ☐Don't know
9. Does holding food in the mouth for a long-time cause tooth decay? ☐ Yes ☐No ☐Don't know

10. Can problems in milk teeth affect permanent teeth? ☐ Yes ☐No ☐Don't know
11. Are modified tooth cleaning aids available for people with disabilities? ☐ Yes ☐No ☐Don't know

**PARENT/ CAREGIVER ATTITUDE**

12. Do you think it is possible to prevent the child's tooth decay? ☐ Yes ☐No ☐Don't know.
13. Do you think it is possible to prevent the child's gum disease? ☐ Yes ☐No ☐Don't know
14. Do you think it is possible to treat the child's tooth decay? ☐ Yes ☐No ☐Don't know.
15. Do you think it is possible to treat the child's gum disease? ☐ Yes ☐No ☐Don't know.
16. Do you think it is important to clean teeth more than once daily? ☐ Yes ☐No ☐Don't know
17. Do you think it is necessary to change the tooth brush every 3 months or when the bristles fall apart? ☐ Yes ☐No ☐Don't know
18. Do you think buying a toothbrush and toothpaste is necessary? ☐ Yes ☐No ☐Don't know

**PARENT/CARE-GIVER PRACTICE**

19. Do you check the child's teeth regularly? ☐ Yes ☐No
20. Do you check the child's teeth only when he/she has a tooth ache? ☐ Yes ☐No
21. Have you taken the child to a dentist before? ☐ Yes ☐No
22. Do you take the child for dental check-ups every 6 months? ☐ Yes ☐No
23. Do you use tooth paste to clean the child's teeth? ☐ Yes ☐No
24. Do you use toothpaste with fluoride (a substance that reduces decay) to clean the child's teeth? ☐ Yes ☐No