

https://dspace.org/

Oral health status of special olympics athletes in four provinces of South Africa

Mokhine, Ingrid Masello Ntombenhle

2016-02-26
http://hdl.handle.net/10539/19757

Downloaded from a DSpace repository. https://dspace.org/

ORAL HEALTH STATUS OF SPECIAL OLYMPICS ATHLETES IN FOUR PROVINCES OF SOUTH AFRICA

Ingrid Masello Ntombenhle Mokhine

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 Dentistry

Johannesburg, 2015

DECLARATION

I, Ingrid Masello Ntombenhle Mokhine, declare that this research report is my own work. It is being submitted in partial fulfilment for the degree of Master of Science in Dentistry at the University of the Witwatersrand, Johannesburg, South Africa. It has not been submitted for any other degree or examination at this university or any other university.

.....

.....day of 2015

DEDICATION

This is dedicated to my mother

Alice Phumzile Mokhine

I thank the Lord that He strengthens me through you

And my nieces Lathitha and Malaika, your presence in my life gives me more reasons to want make a difference.

ABSTRACT

Background: The Special Olympics/Special Smiles has been significant in highlighting the oral health needs of people with intellectual disabilities. The programme covers over 165 countries; its focus was aimed at improving the quality of life of the disabled individuals by addressing various health concerns through sports. The **Objectives** of the study were to determine the dental caries, oral hygiene status and other factors that contribute to the oral health status of Special Olympics athletes. The study also aimed to determine the demographic characteristics of Special Smiles Olympics athletes. **Method**: In this retrospective study, data collected between 2008 and 2011 as part of the Special Smiles programme, was secondarily analysed. Recorded data from 591 participants was used. The oral health status was measured using DMFT index for dental caries; and the Silness and Loe gingival and plaque indices were used for oral hygiene status. Categorical variables were compared using the chi-squared statistics or the Fisher's exact test as appropriate. Statistical significance was inferred at $p< 0.05$. **Results**: The mean age of the subjects was 18 years, with the majority being males at 54.65% (n=323) and females at 45.35% (n= 268) with the overall caries prevalence at 56.5%. The dmft/DMFT scores across the four provinces showed significant differences. The highest scores were in Mpumalanga and Gauteng, while Kwa Zulu-Natal had the lowest scores. This indicated KwaZulu-Natal as having the lowest caries prevalence. There was a correlation between the age and DMFT scores, with DMFT scores increasing with the increase in participants' age. Overall, the results showed that 46.56% (n=567) of the participants had a PI score of 0 and only 31.39 % (n=178) had a PI score of 1; and the majority of participants were

found to have mild gingivitis 27.32% (n=153). **Conclusion**: The athletes were found to have high caries prevalence and the prevalence was highest in Mpumalanga and Gauteng province. The lowest prevalence was found in Kwa Zulu Natal. Caries prevalence, plaque accumulation and gingivitis were high regardless of the frequency of tooth brushing.

ACKNOWLEDGEMENTS

I would like to thank my supervisor Prof. S.L. Shangase for her guidance, patience and encouragement.

Prof. M.J. Rudolph your support and motivation means a lot to me.

I would like to extend my gratitude to SASO for providing access to the data of South African Special Olympic athletes.

Mrs. T.R.M.D. Ralephenya and Dr C.B. Nqcobo, thank you for the sacrifice, support and reminding me that nothing is impossible.

Many thanks to Dr D.M. Thekiso and Dr G.M. Thokoane.

Prof. F Owotade, thank you for sharing your knowledge on statistics with me.

To all my colleagues and friends who kept me motivated on this project, thank you.

TABLE OF CONTENTS

DECLARATION ii
DEDICATION iii
ABSTRACT iv
ACKNOWLEDGEMENTS vi
TABLE OF CONTENTS vii
LIST OF FIGURES x
LIST OF TABLES xi
ABBREVIATIONS AND ACRONYMS xii
CHAPTER 1 1
INTRODUCTION 1
1.1 Background information on Special Olympic 1
1.2 History of Special Olympics in South Africa 2
1.3 Statistics on Disability in South Africa 3
1.4 Oral Health Research on disabilities 4
CHAPTER 2 5
LITERATURE REVIEW 5
2.1 Definition and classification of disabilities 5
2.2 Prevalence of disabilities in South Africa 7
2.3 Disability and oral health 9
2.4 Studies from developing countries 11
Objectives 12
CHAPTER 3 13
METHODOLOGY 13
3.1 Study design 13
3.2 Study sample 13
3.3 Study instrument and data gathering methods 14

3.4 Inclusion criteria 14

3.5 Data and Statistical Analysis 15

3.7 Ethical consideration 15

CHAPTER 4 16

RESULTS 16

4.1 Demographics 16

4.1.1 Distribution of participants by gender 16

4.1.2 Distribution of participants by age 17

4.1.3 Distribution by provinces 18

4.2 Oral health status 18

4.2.1 Dental Caries status 19

4.2.2 Oral hygiene status 21

CHAPTER 5 24

DISCUSSION 24

5.1 Demographics 24

5.2 Dental caries status 25

5.3 Oral Hygiene Status 29

5.4 Limitations 31

5.5 Recommendations 32

5.6 Conclusions 33

REFERENCES 35

APPENDIX I: SCREENING FORM 41

APPENDIX II: SPECIAL OLYMPICS CONSENT 45

APPENDIX III: ETHICS CLEARANCE CERTIFICATE 46

LIST OF FIGURES

Figure 4.1: Distribution of participants by gender…….16

Figure 4.2: Distribution of participants by provinces…….18

Figure 4.3 Distribution of dental caries prevalence per province……..19

Figure 4.4: Distribution of DMFT, PI AND GI……..20

Figure 4.5: Linear relationship between gingival index and Age……22

Figure 4.6: Linear relationship between Plaque index and Age……23

Figure 4.7: Linear relationship between dmft /DMFT and Age…… 23

LIST OF TABLES

Table 4.1: Number and percentage of participants by age group……..17

Table 4.2: Number and percentage of plaque accumulation amongst

the participants.. …….20

Table 4.3: Number and percentage of participants with gingival inflammation……..21

ABBREVIATIONS AND ACRONYMS

BILD	British Institute of Learning Disability
COHOP	Community Oral Health Outreach Programme
CP	Cerebral Palsy
CSHCN	Children with Special Health Care Needs
DMFT	Decayed Missing Filled Teeth (permanent dentition)
GI	Gingival Index
LD	learning disability
MD	mental disability
NCOHS	National Children's Oral Health Survey
OHI	Oral Hygiene Index
PI	Plaque index
(SD)	standard deviation
SHCNS	Special Health Care Needs School
USA	United States of America
UTN	unmet treatment needs
WHO	World Health Organization

CHAPTER 1
INTRODUCTION

1.1 Background information on Special Olympic

Special Olympics were launched in 1968 by the Joseph P. Kennedy Jnr foundation. The aim of the programme was to increase the quality of life, through sports and training. Feldman et al [1] described the key objectives of the programme as improved access of Special Olympics athletes to health care and their proper referral to local healthcare practitioners. Special Olympics is the world's largest programme of sports training and athletic competition for children and adults with intellectual disabilities. The available data indicates that the programme serves between 2.5 – 3.4 million persons with disabilities and has more than 200 programmes in more than 165 countries [2]. It has the world's largest database on the health status of people with intellectual disabilities.

Results from preliminary research data gathered from the United States of America and Peru indicates that the Healthy Athletes programme has an extremely beneficial effect on the health behaviour of the athletes[3]. The evidence also shows that positive changes were observed from the professional volunteers that provided the screenings of the athletes [3].

The Special Smiles programme was established in 1993 at the Boston University Goldman School of Dental Medicine. It was first implemented at Massachusetts Special Olympics summer games. The Special Smiles programme began to highlight and address various oral health concerns of people with special needs, as a result screening events involved dental healthcare professionals who conducted screenings and gave one-on-one oral hygiene

instructions to participants verbally and in writing. Athletes also received a list of local dentists who could treat people with special needs[1,2,3] .

The dental screenings are used as a means to increase awareness of the state of the athlete's oral health for the athletes themselves including their parents and / or caregivers [3]. During screening the athletes are educated on healthy lifestyles choices to help them identify problems that may need additional follow-up.

1.2 History of Special Olympics in South Africa

The Healthy Athletes programme in South Africa (SA) was started in 1997 as a public health organization that focused on the health needs of people with intellectual disabilities. The programme offers free health screenings in the following health areas: vision, oral health, healthy lifestyles, general fitness, and podiatry and sports physicals. The findings observed at the events indicate that significant preventable health issues such as skin conditions, obesity, poor oral health, low bone density and reduced vision and hearing can be experienced by athletes [2]. These documents indicate that 40% of people with intellectual disabilities have a 40% risk of having these preventable health conditions which is higher than that of the general population[2].

Areas served in SA are the Free State, Gauteng, Kwa-Zulu Natal, Limpopo, Mpumalanga, Eastern Cape, Northern Cape and Western Cape provinces. The Special Smiles programme, as part of the Healthy Athletes programme, focuses on oral health screenings. The collection of data started in 1997 and there are currently four screenings carried out per annum. To date no results have been reported to indicate the oral health needs of the athletes in South Africa.

The setting of the current study is based on the data previously collected from the four provinces: Gauteng, Limpopo, KwaZulu-Natal and Mpumalanga within the Special Smiles programme. Gauteng is the smallest province in the country, yet it has the largest population (12 million). It is the economic hub of the country and densely populated [4]. Limpopo is the fifth largest of the nine provinces in the country with a population of 5.4 million people[5] .It is mainly a developing province economically. Kwazulu-Natal takes up 7,7% of South Africa's land area with a population of 10.3 million [6]. Mpumalanga province is a second smallest province with a population of over 4 million people; occupying up to 6.3% of South Africa's land area [7].

1.3 Statistics on Disability in South Africa

According to the South African Census 2001, a total of 2 255 982 persons reported having some kind of disability that prevented them from participating in life activities. This number constituted 5% of the total population[8]

KwaZulu-Natal was indicated to be the province with the highest number of people with disabilities (470 588), whilst the Northern Cape had the lowest number (46 973). In terms of the prevalence the Free State province had the highest percentage at 6.8% and the provinces with the lowest prevalence of disability were Western Cape at 4.1% and Gauteng at 3.8%. The Census 2001 indicated that a higher rate of disabilities was observed among women at 1 173 939 compared to men at 1 082 043. The disabilities affected 2% of persons aged 0-9 years, and the percentage increased steadily with age among those aged less than 40 years, with a rapid increase thereafter [8].

1.4 Oral Health Research on disabilities

Anders and Davis [9] indicated that poor oral health can lead to pain, difficulty with eating, sleep disturbance and decreased self-esteem which can have a dramatic impact on an individual's quality of life. Dental caries and periodontal disease were found to be the most common secondary conditions affecting people with intellectual disabilities [9].

Other studies indicate that the prevalence and severity of poor oral health status is high in children with disabilities[10]. The reasons for this high prevalence include limited understanding on the importance of oral health management, difficulties in communicating oral health needs, disease due to lack of motivation, anticonvulsant medications, fear of oral health procedures and difficulty in accessing healthcare facilities [11].

Studies conducted in different parts of the world show varying results on the oral health status of children with disabilities and the same applies to Africa. Contradictory results have been shown with regards to the oral health status of children with disabilities versus 'normal' children [12,13].

Oredugba and Ankindayomi in their study conducted in Nigeria [12] reported that individuals with special health care needs had poorer oral hygiene and periodontal status, more untreated caries and fewer remaining teeth. It also indicated that their oral health might be influenced by age, severity of impairment and living conditions. Impairment posed great limitations in oral hygiene performance due to potential motor, sensory and intellectual disabilities [12].

CHAPTER 2
LITERATURE REVIEW

The literature review was based on an electronic search of Google Scholar, PubMed and other electronic sources and journals of literature relating to the objectives of the study. The keywords searched during the literature review were “Special smiles reports” and “Oral health status of individuals with disabilities”.

2.1 Definition and classification of disabilities

Children with Special Health Care Needs (CSHCN) are defined as “children who have an increased risk for a chronic physical, developmental, behavioural, or emotional condition and require health and related services of a type or amount beyond that required by children generally” [14]

Bernier (1990) stated that the American Health Association defines a child with a disability as a child who for various reasons, cannot fully make use of all his or her physical, mental and social abilities – in other words, a child who cannot play, learn or do things other children his or her age can. Intellectually disabled children are defined by the American Academic of Pediatric Dentistry Council on Clinical Affairs (2004) as individuals who have physical, mental, sensory, behavioral, cognitive, emotional and chronic medical conditions which require health care beyond that which is considered routine, and this involves specialized knowledge, increased awareness, attention and accommodation.

Leonardi et al [15] defined disability as an umbrella term for impairments where there is limitation of activity, restriction of participation with negative aspects on interactions between the disabled individual and their personal environment. Disabilities are classified into major

divisions which are developmental, sensory impairment, orthopaedic disorder, medical disability, cognitive impairments or mental illness, degenerative nervous system disorder and communication disorders [16].

The International Classification of Functioning, Disability and Health developed by the World Health Organization (WHO) 2001 defines a disabled child as one with a health or medical condition resulting in difficulty in performing one or more functional activities or having "activity limitations".

Disabilities may present in different forms, for example, Down's Syndrome; Cerebral Palsy; Epilepsy and Autism amongst others. The characteristics of mental retardation include Down's syndrome and presents difficulties with learning, critical thinking and skill development [16]. Cerebral Palsy according to Rosenbaum [17] "describes a group of disorders of the development of movement and posture, causing activity limitations that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain[17]. The motor disorders of Cerebral Palsy are often accompanied by disturbances of sensation, cognition, communication, perception, and/or behavior, and/or by a seizure disorder". Epilepsy is characterized as a disorder caused by chemical imbalance in the brain and it is associated with head injuries, infection and developmental disorders [16]. Autism is regarded as a "lifelong neurologic disability and it is associated with mental retardation" [16] .

The challenge that people with special needs and intellectual disabilities experience during dental treatment is difficulty to cooperate when treatment provided on the chair. This was confirmed by Hennequin et al [18] who emphasized the need not to provide special needs patient with complex treatment options that cannot be provided in a normal dental operatory, as they

may necessitate performance under general anesthesia. It has therefore been deemed important to conduct studies among people with disabilities to facilitate prevention and early detection of treatment needs; as this will help minimize the challenges accessing oral health care services. Where there is a need for specialist treatment, structured systems should be in place for such to be rendered [18].

Oral health care should essentially be accessible to all without discrimination on the basis of ability / disability or age. Children are a recognized priority in planning for health programmes, and should be even more so if they are disabled. A normal child gets the benefit of love and care from parents and society whereas less privileged children such as physically handicapped, mentally handicapped and socially handicapped are often neglected [19]. Therefore, plans for prevention and intervention should also prioritize individuals with disabilities

2.2 Prevalence of disabilities in South Africa

According to the WHO statistics, individuals with disabilities comprise 10% of the population in developed countries and 12% in developing countries [11].

The prevalence of disability among children in South Africa is estimated to be between 5.2% and 6.4% in children under the age of 9 years [8]. Three other studies carried out among children with motor, sensory and intellectual disabilities in the rural areas reported similar results [20,21,22].

The first National Disability Survey in 1999 yielded the prevalence for all disabilities at 5.9% and that of intellectual disability of 1.1% [21].The second study was part of the National Census Survey and indicated the prevalence of overall disabilities at 5% and intellectual disability at

0.5% [22]. The third study involved the National Survey in 2007 which indicated that the prevalence of severe intellectual disability or learning disability was 0.27 % [23].

There is a lack of reliable information on the nature and prevalence of disability in South Africa as discussed in the White Paper on South Africa's Integrated National Disability Strategy [24] . Reasons given for the lack of information include the fact that disabilities were viewed as health and welfare frameworks and not integrated in the government mainstream statistical processes. (White Paper on South Africa's Integrated National Disability Strategy) [24]. Lansdown [25], in the report on the Rights for Disabled Children in South Africa indicated the reasons for the unreliable statistics to be as follows:

- "There are different definitions of disability, with no clarity of distinctions between degrees of severity of impairment or need and assessment"
- "Different survey technologies are used to collect information"
- "Some of the data has excluded people living in institutions and therefore make the data collection skew"
- "Lack of screening and early identification services led to a lack of awareness of disability among the children"
- "There are negative traditional attitudes towards people with disabilities which have led to their exclusion when records are compiled"
- "There is a poor service infrastructure for people with disabilities in some of the underdeveloped areas which have led to a lack of awareness of disabled people"
- "Violence levels in some areas have impeded the collection of data affecting the overall picture"

Despite the problems stated above regarding gathering the data of people with disabilities, information from the South African Demographic Health and Survey [26] can be utilized to give an understanding of the situation.

2.3 Disability and oral health

Individuals with special needs are more likely to receive inappropriate and inadequate treatment or be denied health care altogether [27]. Persons with disabilities who do not receive adequate preventive care and routine health care maintenance may require more expensive tertiary care. They may also develop secondary conditions that may further limit their functioning, quality of life and life expectancy [27]

Amour et al [28] indicated that oral health is important to the general health and well-being of all citizens. There is concern that for some people with disability, unmet oral health needs coupled with disability could result in medical complications that decrease the level of activity, increase functional dependence and in turn, increase health-care expenditures [28]. Despite this concern, there has been no systematic national surveillance of oral health among people with disabilities.

There is a burden of oral health disease in the world and Petersen [29] indicated that dental caries and periodontal diseases have an impact among underprivileged groups in the developed and developing countries. Peterson et al [30] indicated that poor oral health may have a profound effect on general health, and several oral diseases are associated with chronic diseases like diabetes mellitus amongst others. Several studies have highlighted the significance of good oral hygiene, which if not maintained may lead to pain, problems with eating, chewing, digestion, speech, smiling and communication due to missing, discolored or damaged teeth

and appearance which may have a major impact on people's daily lives and well-being [11,19,30]. All these may restrict activities at school, work and home which has the probability to cause millions of school and work hours to be lost throughout the world[30].

Parents of Children with Special Health Care Needs (CSHCN) have reported that excess costs were the most common impediment to their children receiving needed care, and the financial burden for health care costs and out of pocket care expenses amongst this group was perceived to be higher than for children without special needs [31].

Disparities between the health of persons with disabilities and the general population have been shown to exist. Johnson and Woll [27] described disparity as "differences in quality of health care received by a segment of the population (in comparison with the general population) that is not due to access-related factors or clinical needs, preferences, and appropriateness of interventions. Similarly, differences in the levels of oral diseases between the general population and people with intellectual disabilities have been reported; and the need for dental preventive and treatment service has been shown to be substantially unmet[32]. To a large extent, the unmet oral needs among intellectually disabled people have been shown to be associated with poverty [33].

A need for a protocol to serve as a guideline in the prevention of oral disease for individuals with special needs has been established. Such a protocol would facilitate prevention thus reducing the need for treatment and unmet treatment needs; which may manifest in pain [35, 36, 37].

2.4 Studies from developing countries

Results of studies conducted in the developing countries are no different from the studies conducted elsewhere in the world, confirming a high prevalence of oral diseases among individuals with disabilities [38, 39]. In these studies dental caries, fluorosis, pain, missing teeth, gingival and periodontal conditions were highlighted in the findings. The analysis on treatment needs indicated that 15.8% required urgent extraction, urgent endodontic treatment or surgical management[39]. Unmet dental care needs in this region were reported and ascribed to poverty [12].

Salojee et al [20] indicated that childhood disability in South Africa has failed to receive adequate attention from governmental agencies such as health, education and social welfare departments, despite there being more than 1 million disabled children in the country. There is a need to gather data in Africa as most of the literature is from the studies done in Europe and America.

The Special Olympics Special Smiles programme is significant in highlighting oral health needs and oral health status of people with intellectual disabilities and it enhances referral of these individuals for appropriate oral health care. There is therefore a need to analyze data gathered on Special Olympic athletes, as this will help identify the oral health needs of the Special Olympics Athletes and inform the planning of oral health services for this vulnerable group of athletes.

The aim of this study therefore, was to determine the Oral Health Status of Special Olympic Athletes in four provinces of South Africa i.e. Gauteng, Limpopo, KwaZulu-Natal and Mpumalanga.

Objectives

1. To determine the caries status and the oral hygiene status of Special Olympics athletes.

2. To determine factors contributing to the caries and oral hygiene status of Special Olympics athletes.

3. To determine the demographic characteristics of Special Smiles Olympics athletes.

CHAPTER 3
METHODOLOGY

3.1 Study design

This was a retrospective descriptive study, based on secondary analysis of data collected for the SA Special screenings in Gauteng, Mpumalanga, Limpopo and KwaZulu during 2008-2011.

3.2 Study sample

The sample size was initially 591 participants, however due a smaller group of subjects less than 6 years of age, the three subjects in this group were excluded; thus reducing the sample size to 588.

The selection criteria were based on selected questionnaires of participants aged between six years and fifty five years (see Appendix I). Only questionnaires that were completed in full were included in the study and made up the study sample. The sample was grouped according to the WHO standard age groups in order to standardize with other studies on people with disabilities and thus facilitate comparison. The age groups were as follows: 6-9 years, 10-19 years, 20-29 years, and 30-49 years [40].The age group 30-49 was expanded to 30-55 in order to accommodate the outliers.

The smaller age groups of less than 6 years were excluded, thus in this study the selection criterion was based on questionnaires of participants of ages of 6-55years. This was done to maintain inclusion criteria consistency.

The sample size was estimated with the aid of statistical software and the following formula was used for the calculation of the sample size:

N = 4zα2S2 ÷ W2 where N is the sample size, zα is 1.96 (standard normal deviate for a confidence level of 95%), S is the standard deviation and W is the desired total width N = 4(1.96)2x52 ÷ 1=384. Therefore the minimum number of the data to be analysed was of 384 athletes from the four provinces. The STATA 11 software was utilized to analyze the data that was gathered. All statistical significance was calculated at the 5% ($p < 0.05$) significance level.

3.3 Study instrument and data gathering methods

A data capturing spreadsheet was designed to record the following variables: participants' age, gender, province, decayed missing filled teeth (DMFT) in permanent dentition, Gingival Index (GI), Plaque Index (PI) from the screening forms used in the Special Olympics (Appendix I).

In the SA Special's screening, examiners used headlamps or flash lights along with disposable mirrors to detect carious tooth surfaces visually based on cavitation. No probing was done to detect caries on the tooth surfaces.

3.4 Inclusion criteria

All the questionnaires of participants in the Special Olympics programme between the ages of 6 – 55 years that were completed in full were included in the study.

3.5 Data and Statistical Analysis

The data was cleaned and entered into the excel spread sheet. Descriptive statistics was used to determine the demographic characteristics of the participants. Frequency tables were used to present the categorical variables and measures of central tendency were used to present continuous variables. Non parametric statistics was used to analyze the variables which were not normally distributed. The confidence level for this study was set at 95%. The DMFT, PI and GI were compared between male and female within the same provinces using a T-test as these were paired variables. To compare the DMFT, PI and GI across the four provinces the ANOVA test were used. The Chi square test was used to evaluate the association between categorical variables.

To determine demographic correlates, that is; age, gender and province to the caries and oral hygiene status of Special Olympics athletes, a T-test, Kruskal-Wallis test and Mann-Whitney U test were used where required/where data was not normally distributed.

3.7 Ethical consideration

Permission to use data collected during the Special Olympics meetings was sought and obtained from the Foundation (Appendix II). To protect the identities of the participants of the Special Olympics, the data collection sheets were numbered. The ethical approval to conduct the study was provided by the University of the Witwatersrand, Johannesburg Faculty of Health Sciences Ethics Committee: Approval no M120266, (Appendix III).

CHAPTER 4
RESULTS

4.1 Demographics

The results of the demographic characteristics of the Special Smiles Olympics athletes were analysed based on the gender, age and province of the participants. The total sample of the study population consisted of 588 participants.

4.1.1 *Distribution of participants by gender*

Figure 4.1 describes the distribution of the participants by gender which indicate that there were more males at 54.6% (n=321) compared to females at 45.4% (n= 267) participating in the study.

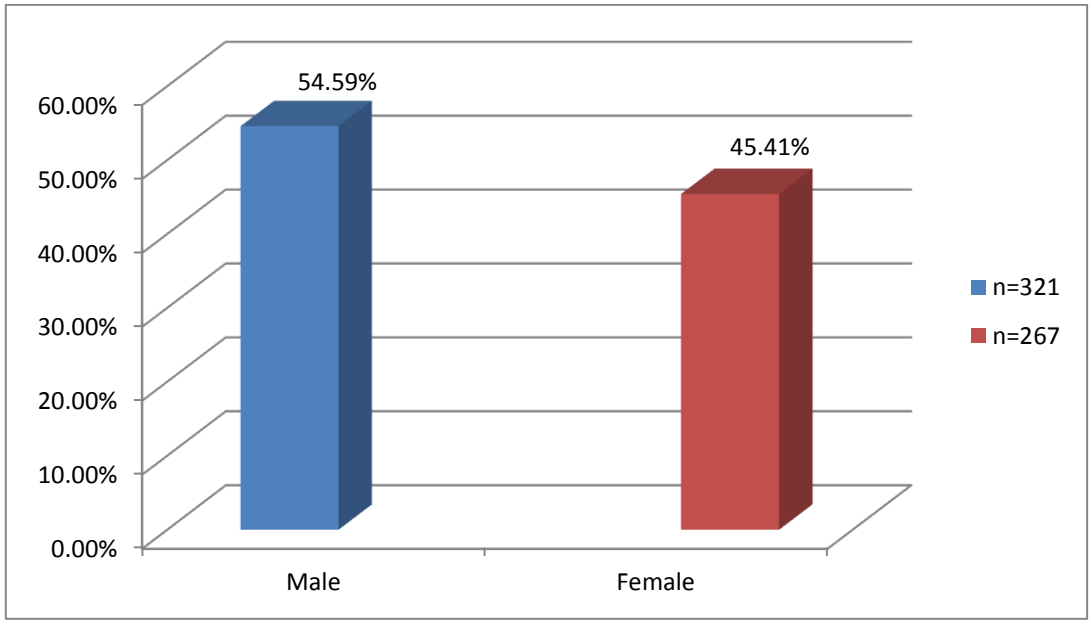


Figure 4.1: Distribution of participants by gender

4.1.2 Distribution *of participants by age*

The athletes were aged between 6 to 55 years with a median age of 17 years (IQR 14-21years). Table 4.1 shows the distribution of the age groups, which indicates the majority to be in the 10-19 year group 64.29 % (n=378) followed by the 20-29 year group at 26, 53% (n=156).

Table 4.1: Number and percentage of participants by age group

Age group	n	%
6-9	24	4.08
10-19	378	64.29
20-29	156	26.53
30-55	30	5.10
Total	588	100.00

4.1.3 Distribution *by provinces*

The study participants were from four provinces as indicated in Figure 4.2; namely Gauteng, Limpopo, KwaZulu-Natal and Mpumalanga. The province with the highest number of participants was Limpopo with 56.8% (n=325) and Mpumalanga had the least number of participants which was 5.57% (n=33).

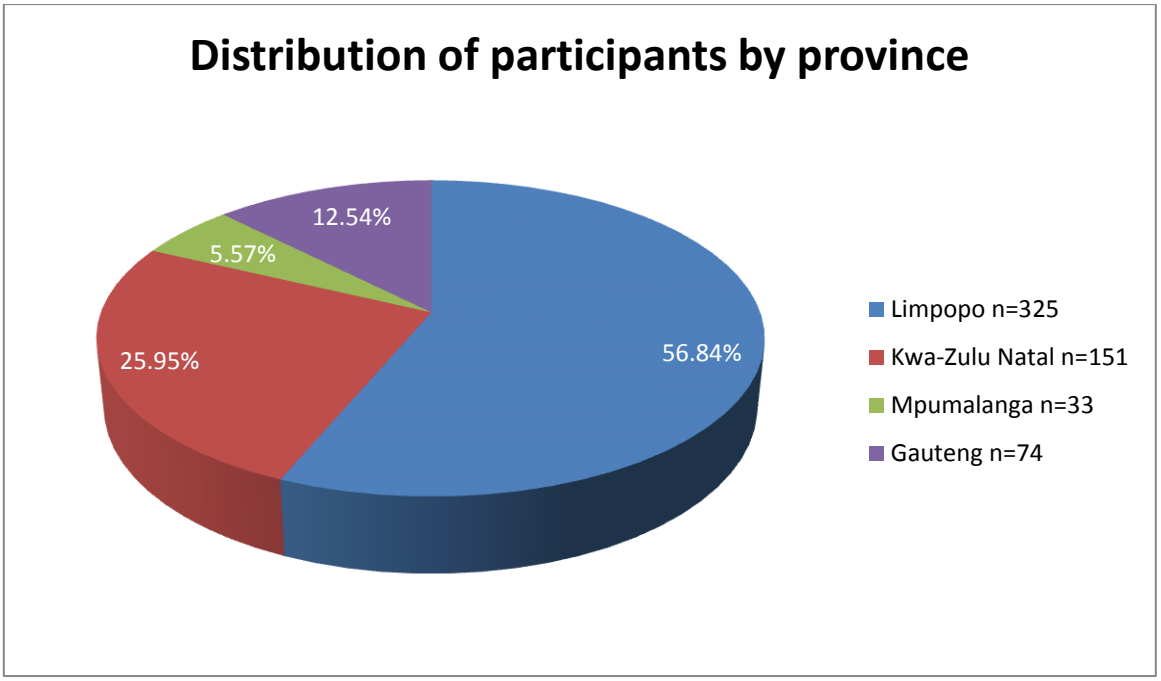


Figure 4.2: Distribution of participants by provinces

4.2 Oral health status

4.2.1 *Dental caries status*

The overall caries prevalence was 56.5% and the gender distribution of the caries prevalence was higher among the females at 52.80% (n= 141) compared to males at 47.19% (n=126). However, the difference in the caries prevalence was not statistically significant (p=0.10). Figure 4.3 describes the dental caries prevalence per province. The highest prevalence was found in Mpumalanga (87.88%) and Gauteng province (84.93%) and the least was in

KwaZulu-Natal province.

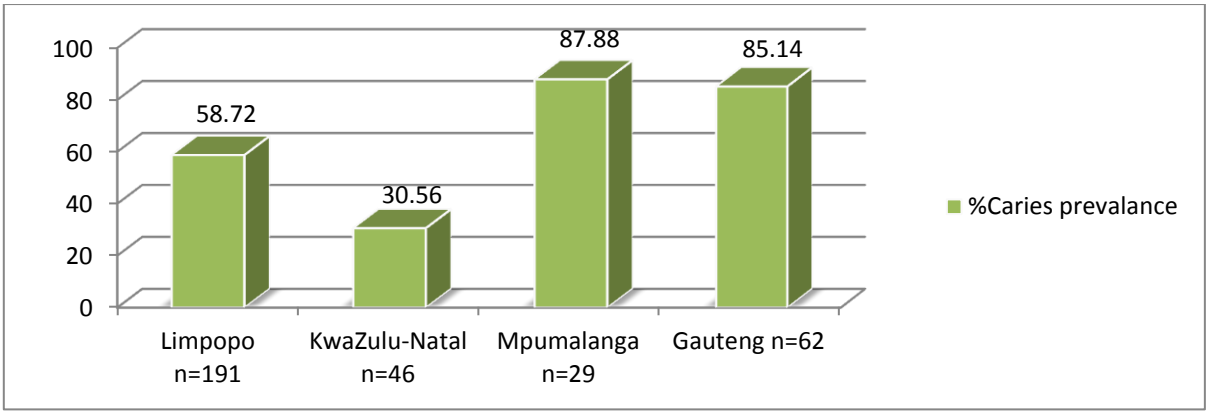


Figure 4.3: Dental caries prevalence per province (p = 0.000).

The overall mean DMFT score was 0.98 SD 0.12. The DMFT scores for males was found to be 0.10 SD 0.13 and for females was 0.09 SD 0.12.There was a significant differences in the DMFT scores between the males and females (p=0.028). There were significant differences in the DMFT scores between the provinces (p=0.000) as indicated in Figure 4.4. The post hoc test indicated significant differences between Kwa-Zulu Natal and the three provinces namely Limpopo, Mpumalanga and Gauteng respectively (p=0.000).Significant differences in the DMFT were also found among the different age groups (p=0.001).

The three provinces; Gauteng, Mpumalanga and Limpopo had more or less similar DMFT scores, Kwazulu-Natal province was observed to have significantly lower DMFT scores compared to the three provinces.

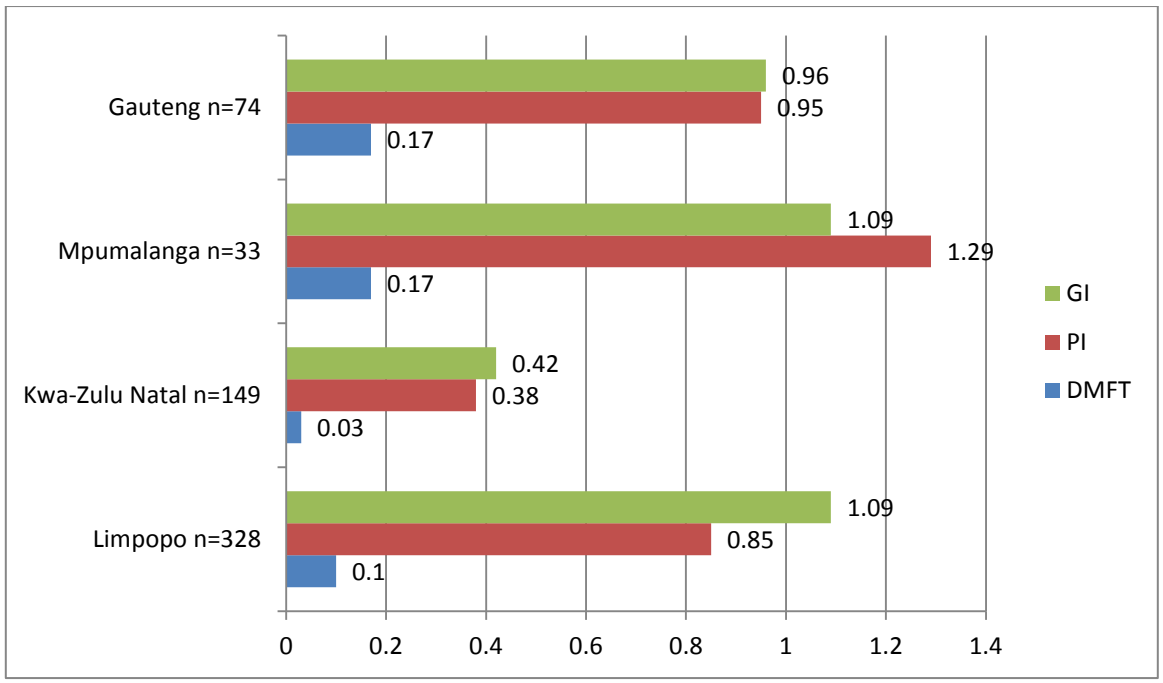


Figure 4.4: Distribution of DMFT, PI AND GI

4.2.2 *Oral hygiene status*

Tables 4.2 and 4.3 describe the distribution of participants by plaque accumulation and gingival inflammation respectively. From the whole sample, the results showed that 46.56% (n=262) of the participants had a PI score of 0 and only 3.19 % (n=18) had a PI score of 3 which means they had abundant accumulation of plaque.

Table 4.2: Number and percentage of plaque accumulation among the participants

PI	n	%	Scores
No plaque	262	46.45	0
thin film	178	31.56	1
Moderate accumulation	106	18.79	2
abundant accumulation	18	3.19	3
Total	564	100.00	

The analysis on gingival inflammation indicates that 54.40% (n=303) of the participants were found to have normal healthy gingiva as depicted on Table 4.3. Further analysis on gingival inflammation indicates that mild gingival inflammation was observed in 27.47% (n=153) of the participants and only 6% had severe gingival inflammation as illustrated in Table 4.3.

Table 4.3: Number and percentage of participants with gingival inflammation

GI	n	%	Scores
Normal gingiva	303	54.40	0
Mild inflammation	153	27.47	1
Moderate inflammation	66	11.85	2
Severe inflammation	35	6.28	3
Total	557	100.00	

Figure 4.4 describes the mean PI and GI scores per province and both Mpumalanga and Limpopo had the same GI score of 1.09. When comparing the PI scores per province, Mpumalanga province maintained the highest PI score of 1.29 (SD 0.78) and KZN had the lowest PI score of 0.38 (SD 0.80).

The study indicated that 61.51% of the female participants had normal gingiva compared to 48.70% of males. About 29% of male participants had mild gingivitis however there was no significant difference in gingival inflammation between the male and females.

In terms of the analysis of the frequency of brushing, of all those who responded to the question on their brushing frequency (n=580), 84.7% (n=490) reported brushing once or more a day, with 6.4 % (n=90) uncertain of their brushing frequency per day. Of those that were brushing once or more a day, 58.57% had DMFT scores of less than 1. The results also

indicated that some participants brushed less than once per week 0.7 % (n=4) and were shown to have higher DMFT scores.

The results indicated that the participants who were brushing once or more per day presented with a mean PI score of 0.7 (SD 0.80) and GI score of 0.89 (SD 3.84).

When assessing the relationship between age and oral hygiene status, the results showed that there was a linear relationship which was significant from the age of 20 as seen in figure 4.5 and 4.6 below.

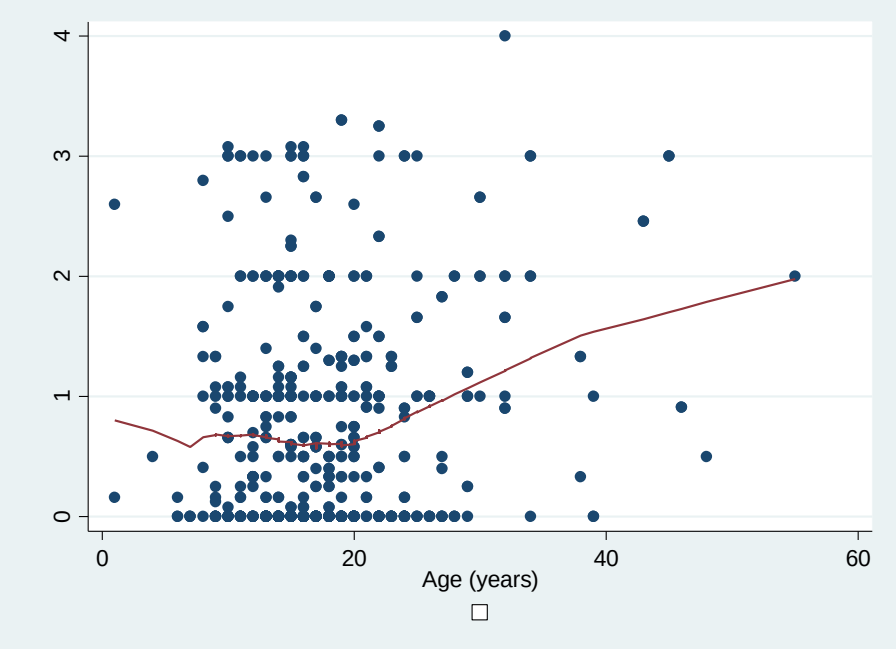


Figure 4.5: Linear relationship between gingival index and Age

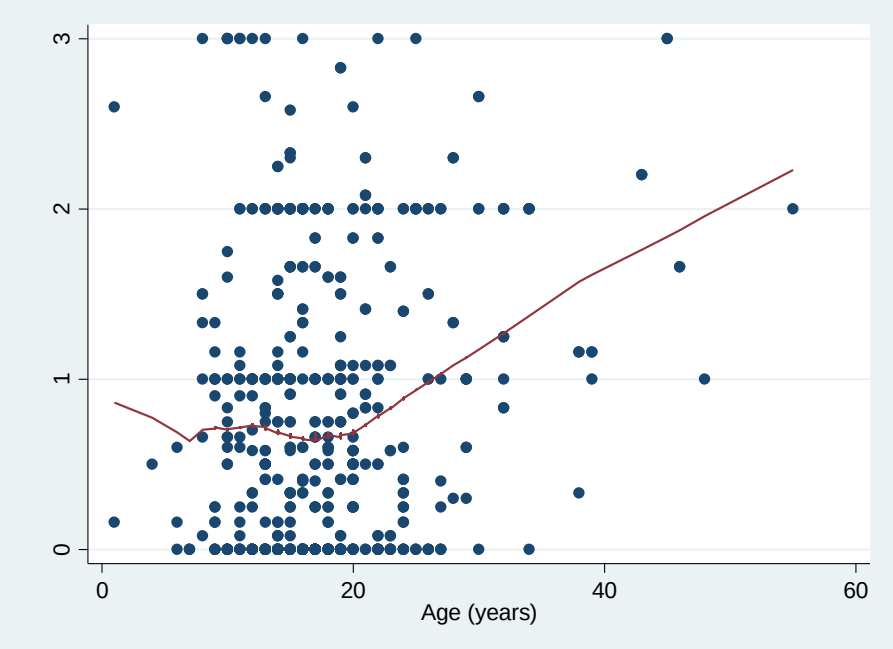


Figure 4.6:Linear relationship between Plaque index and Age

.

CHAPTER 5
DISCUSSION

This was a retrospective descriptive study, analyzing data collected for the SA Special Olympics and the findings indicated the importance of the screenings as they highlighted the oral health status of people with special needs.

Data collected in most developing and developed countries has revealed a high need for treatment among athletes participating in the Special Olympics[2, 39, 41].

The focus of this study was on Special Olympics' athletes with varying disabilities.

5.1 Demographics

The gender distribution in this study was similar to previous studies where there were more male participants than females [32, 39]. This could be attributed to differences in preference between males and females in general with regards to participation in sporting activities.

The median age of the participants in the study was 17.96 years and the majority was in the 10-19 year group at 63.9 %. According to Statistics SA and Census 2001 the province with the highest number of disabled persons is Kwazulu-Natal (470 588) while Northern Cape had the lowest (46 973). Free State had highest percentage (6. 8%) in terms of prevalence whilst Western Cape had the lowest (4.1%). This study indicated that the province with the highest number of participants was Limpopo with 56.35%, followed by Kwa-Zulu Natal with 25.55%, Gauteng with 12.52% and Mpumalanga had the least number of participants which was 5.58%. This is however in contrast to Statistics South Africa [8]which reported Kwazulu-Natal

as the province with the highest number of disabled persons. The reason for this could be that fewer individual presented for screening and publicity of the special smiles screenings might have been limited in certain provinces. The difference in the presentation of the results i.e. numbers (Statistics SA) versus percentages (current study) could also be a contributing factor to the difference in results. Percentages represent parts of the whole whilst numbers have no reference to the whole.

5.2 Dental caries status

The overall caries prevalence was 56.5% and the results also showed an increasing trend in the prevalence across the provinces ranging between 30% - 87%. Mpumalanga and Gauteng provinces had the highest prevalence of dental caries at 87.88% and 85.14% respectively. The caries prevalence in the Gauteng province in the current study is higher than the one reported in a study that was conducted among children with special needs in Johannesburg, Gauteng [42].The differences in the caries prevalence could be linked to the smaller sample sizes or the availability of oral health services for the various groups. The results of the study among children with special needs by Nqcobo et al [42] showed that the caries prevalence in the permanent dentition was 33% which is much lower than the prevalence rate of 85.14% reported in this study. The province with the least prevalence of dental caries was Kwa-Zulu Natal which had a rate of 30.56%. However this current study is different to Nqcobo et al study where participants were mostly institutionalized compared to the current study where participants were not institutionalized. The Nqcobo et al study followed the WHO guidelines to detect caries under natural light, using a mirror and a probe; a tooth was considered carious if it had a frank cavity. In this study caries was detected by visual examination and no probing

was done. Given the difference in caries assessment protocols between the two studies, the current study should have expectedly reported less caries prevalence as no probing was done. However the observation that the cohort seen by Nqcobo et al was mostly institutionalized subjects may account for this discrepancy as they may have been subjected to an oral hygiene routine, hence the low caries prevalence. A study by Alaki and Bakry [43] in accounting for high caries prevalence postulated that uncooperative behaviour in the dental setting made it difficult to provide ideal dental treatment.

The overall mean DMFT score was 0.98 SD 0.01 and there was no difference between the DMFT scores for males compared to females as the scores were 0.10 and 0.09 respectively.
The post hoc test indicated significant differences between Kwa-Zulu Natal and the other three provinces (p=0.000). Significant differences in the DMFT was also found among the different age groups (p=0.001).

The Gauteng Province has the fastest growing population resulting from provincial migration. This influx increases the oral disease burden on resource availability to support the population in the province, and negatively impacts on the ability to purchase oral hygiene aids and access to oral health. The Mpumalanga province has a viable bio-fuel industry and is rich in agricultural resources, however, the majority of the population lives in low economic areas and is poor. These low economic areas have poor infrastructure and have high concentrations of poverty which also limit access to oral hygiene aids and oral health services, for the general population including those with special needs. Similarly, despite being driven by the mining industry, the Limpopo province is faced with high unemployment rate especially amongst the

youth. The province has a large number of rural dwellers whose households are run by individuals depending on social grants. KwaZulu-Natal is the second most densely populated province and has a diverse growing economy. Due to rising unemployment rate there is reduced household income [5]. Set against this background one can therefore understand the high prevalence of caries reported in the current study. The socio-economic factors such as low household income, poverty, unemployment and overpopulation can play a major role in preventing individuals from accessing health facility and therefore resulting in unmet treatment needs as reflected by high caries prevalence among others.

The high dental caries prevalence, reported in this and other studies with similar findings are most likely as a result of individual physical limitations due to physical disability, intellectual disability, social background and support systems. The study conducted in Nigeria by Oregduba [12] concluded that social background, physical limitation and intellectual disability contribute to unmet oral health needs including high dental caries prevalence. This concurred with research conducted by Altun [11] in Turkey that indicated that there is high prevalence (84.6%) of caries among CSHCN. This study is also in agreement that there is a high prevalence (56.5%) of caries amongst children with disabilities.

The DMFT index has been commonly used to evaluate the caries prevalence in communities. However the relationship between the two has not always been aligned. The findings of low caries prevalence in countries which were found to have high/very high DMFT scores were spotted to have a skewed distribution of caries prevalence. Based on this, it is evident that DMFT scores do not have an accurate effect on the skewed distribution; thus leading to the misconception that caries is well controlled whilst the population is still suffering from high caries prevelance[44]. The findings in the current study confirm this as shown by high caries

prevalence in provinces (Gauteng and Mpumalanga) that were otherwise reported to have low DMFT scores of less than 1.

Despite the availability of data on the rate of caries prevalence in children, there is little evidence to suggest that caries amongst disabled persons is effectively addressed through policy in South Africa [45]

5.3 Oral Hygiene Status

The data analysis indicated that the overall prevalence of gingival inflammation was 45.60% and the prevalence of plaque accumulation was 53.44%.The participants in the study were shown to have a high prevalence of gingival inflammation. A Similar study conducted by Morgan et al [46] in the United States reported a gingival inflammation prevalence of 18% when evaluating the oral health status of adults with intellectual and developmental disabilities [46].This latter study in United States of America is however a first world country, hence the different findings in our study are not surprising.

As indicated in the results section, the data from the current study indicated that there were more male participants (n=323) than female participants (n= 268). Female participants were found to have less gingival signs of periodontal disease compared to male subjects. This is possibly due to females being more likely to be conscious in following set routine in self-care, and oral care is no different. These findings are in agreement with the study conducted in nine states of Nigeria by Oregduba et al[39] which reported different scores in the PI and GI of the participants in the nine states and attributed their findings to poverty and lack of policy implementation, and hence decreased access to oral health care[39].

Figure 4.4 in the results section described the mean PI and GI scores per province which indicated that Mpumalanga and Limpopo had the same GI scores of 1.09, thus indicating mild gingivitis which is a form of periodontal disease affecting only the gingiva with mild inflammation. Results from a study by Lopez et al [38] conducted in Puerto Rico concluded that 60% of the participants showed signs of periodontal disease. This is somewhat contrary to the

current study as only 45.60% of the participants had gingivitis as determined by the GI scores of 1 to 3. This comparison is however not accurate as the periodontal index was not used in the current study to assess the periodontal status.

This study found that 58.57% of the participants who reported that they were brushing once or more a day were found to still have significant dental caries (p=0.000), even though the levels were lower among those who brush less frequently. The reason for dental caries prevalence could be the multifactorial aetiologic nature of dental caries which includes factors like diet (consumption of cariogenic fermentable carbohydrates), and reduced salivary flow in addition to the presence of plaque. Secondly the participants were possibly using ineffective brushing methods given their physical limitations linked to the disability. The third and subjective reason could be the bias self-reporting by the participants of the study. The findings among participants who brushed once or more per day indicated that 26% had mild gingival inflammation.

The high caries prevalence and poor gingival health (45.60%), as seen in the current cohort of people with disabilities, result in greater demand for oral health professionals, preventative care services, oral health promotion, equipment, oral health facilities and the financial resources to cater for the such needs [47].

The creation of Special Smiles Healthy Athletes screening programs, presents a simple way to assess the oral health status and offer dental services to persons with special needs. It is also an opportunity to stimulate dental practitioners in treating person with special needs [41].

5.4 Limitations

Due to the nature of the study design which focused on secondary data analysis there was limited information. The screening form used in the study did not indicate the various forms of disabilities. As a result, we could not investigate the associations between oral health status and different types of disabilities. The use of secondary data was limiting as it did not provide information on how the DMFT, PI and GI were measured. Individual components of D, M, and T were not determined, though part of the screening form; this therefore limited the study in addressing the unmet treatment needs of the participants.

Even though there were participants who were on primary dentition dmft was not recorded.

The periodontal status of the participants was not adequately determined in the screening form as the GI does not provide a full clinical picture of the periodontal status of the participants that could be observed in other epidemiologic survey such as the CPITN.

The fact that the data was sourced from the screenings only involved the Special Olympics athletes, makes the results fall short in giving a bigger picture of oral health status of disabled individuals in South Africa. Not all individuals with disabilities participate in the Special Olympics which render the sample used in the current study not representative of individuals with disabilities in South Africa nor their oral health status and needs.

5.5 Recommendations

Despite the availability of data on caries prevalence rates in children with disabilities which concurs with the findings in this study, there is little evidence to suggest that caries amongst disabled persons is effectively addressed through policy in South Africa [45]. Therefore a strong recommendation is made that oral health survey are to be conducted which extend and include individuals with disabilities, who are not participants in the Special Olympics in all nine provinces of the country. This would give a much broader picture of oral health status of people with disabilities in South Africa. The survey should not only focus on dental caries and oral hygiene but should also include appropriate periodontal health assessment tools, malocclusion and assessment of oral mucosal health.

The screening forms can be modified to include questions that indicate the different disabilities of the athletes in the Special Smiles as there are differences in the oral health status of individuals with different disabilities. The screening form should also include caries measuring according to WHO guidelines in order to enable possible comparison.

Quantitative and qualitative studies that focus on the impact of oral health disease on Quality of Life could be conducted among the athletes. As discussed in the literature review, Anders and Davis [9] indicated that poor oral health led to pain, difficulty with eating, sleep disturbance and decreased self-esteem which had a dramatic impact on the individual's Quality of Life. More research to provide better insight on this aspect is therefore justified and recommended.

Further longitudinal studies are recommended to analyse the impact of the dental screening and health promotion activities in the Special Smiles programme on the oral health status of

the athletes. This will provide information on whether the athletes referred for dental treatment attend to the recommendations made during the screening to improve the high unmet treatment needs.

We recommend that health promotion and prevention strategies be put in place in all four provinces in order to prevent any risk to high caries prevalence among the Special Smiles athletes.

Oral health professionals should receive training as part of their formal training, in management of people with special needs in a dental chair. This would ensure that the treatments needs of these individuals are addressed.

Collaboration between the Special Smiles programme, Departments of Oral Health and oral health science professionals should be encouraged to provide treatment for the athletes that have been screened including maintenance. Provision of oral health care services should also be extended to people with special needs who are in centres of care and who cannot attend Special Smiles activities.

5.6 Conclusions

The study offered the opportunity to investigate the dental caries and oral hygiene status of athletes participating in the Special Smiles programme. The athletes as a group were found to have high caries prevalence though low DMFT scores and the prevalence were higher in Mpumalanga and Gauteng province. The lowest prevalence was found in Kwa Zulu Natal.

Caries prevalence, plaque accumulation and mild gingival inflammation were high regardless of the frequency of tooth brushing and unmet treatment needs.

The socio-economic factors such as poverty, low household income, unemployment and limited resources have a negative impact on oral health.

This highlights a need within the context of South Africa to address the needs of people with disabilities. Oral health is important to the general health and well-being of people with disabilities. The results of this study should be interpreted with caution due to the small number of participants and the highlighted limitations and therefore cannot be generalized.

REFERENCES

1. Feldman C A, Giniger M, Sanders M, Saporito R, Zohn H K, Perlman S P. Special Olympics, Special Smiles: Assessing The Feasibility Of Epidemiologic Data Collection. *The Journal of the American Dental Association* **1997,** *128* (12), 1687-1696.

2. Olympics, S. History. http://www.specialolympics.org/history.aspx (accessed October 2014).

3. Olympics, S. Healthy Athletes. http://resources.specialolympics.org/Topics/Research/Program_Research_Toolkit/Special_Olympics_Initiatives__Healthy_Athletes.aspx (accessed July 2014).

4. SouthAfrica.info Gauteng province, South Africa. http://www.southafrica.info/about/geography/gauteng.htm#.VeNDOaMaLDc (accessed July 2015).

5. SouthAfrica.info Limpopo province, South Africa. http://www.southafrica.info/about/geography/limpopo.htm#.VeNFi6MaLDc (accessed August 2015).

6. SouthAfrica.info KwaZulu-Natal province, South Africa. http://www.southafrica.info/about/geography/kwazulu-natal.htm#.VeNEkqMaLDc (accessed August 2015).

7. SouthAfrica.info Mpumalanga province, South Africa. http://www.southafrica.info/about/geography/mpumalanga.htm#.VeNGNaMaLDc (accessed August 2015).

8.STATS SA Profile of persons with disabilities in South Africa Statistics. http://www.statssa.gov.za/?p=3180 (accessed July 2015).

9. Anders P L, Davis E L. Oral health of patients with intellectual disabilities: a systematic review. *Special Care in Dentistry* **2010,** *30* (3), 110-117.

10. Simon E, Matee M I, Mathee M, Scheutz F. Oral health status of handicapped primary school pupils in Dar es Salaam, Tanzania. *East African medical journal* **2008,** *85* (3), 113-117.

11. Altun C, Guven G, Akgun O M, Akkurt M D, Basak F, Akbulut E. Oral health status of disabled individuals attending special schools. *European journal of dentistry* **2010,** *4* (4), 361.

12. Oredugba F A, Akindayomi Y. Oral health status and treatment needs of children and young adults attending a day centre for individuals with special health care needs. *BMC oral health* **2008,** *8* (1), 30.

13. Nahar S G, Hossain M A, Howlader M B U, Ahmed A. Oral health status of disabled children. *Bangladesh Medical Research Council Bulletin* **2010,** *36* (2), 61-63.

14. McPherson M, Arango P, Fox H, Lauver C, McManus M, Newacheck P, Perrin J, Shonkoff J B S. A new definition of children with special health care needs. *Pediatrics* **1998,** *102* (1), 137-140.

15. Leonardi M, Bickenbach J, Ustun T B, Kostanjsek N, Chatterji S, Consortium M. The definition of disability: what is in a name? *The Lancet* **2006,** *368* (9543), 1219-1221.

16. Darby M L, Walsh M. *Dental hygiene: theory and practice*. Elsevier Health Sciences: 2014.

17. Rosenbaum P, Paneth N, Leviton A, Goldstein M, Bax M, Damiano D, Dan B, Jacobsson B. A report: the definition and classification of cerebral palsy April 2006. *Dev Med Child Neurol Suppl* **2007,** *109* (suppl 109), 8-14.

18. Hennequin,M, Faulks D, Roux D. Accuracy of estimation of dental treatment need in special care patients. *Journal of dentistry* **2000,** *28* (2), 131-136.

19. Siddibhavi M. Oral Health Status of Handicapped Children Attending Various Special Schools in Belgaum City Karnataka. **2012**.

20. Saloojee G, Phohole M, Saloojee,H, Ijsselmuiden C. Unmet health, welfare and educational needs of disabled children in an impoverished South African peri-urban township. *Child: care, health and development* **2007,** *33* (3), 230-235.

21. Schneider M. Disability and the environment. *Disability and social change: A South African agenda* **2006**, 8-18.

22. STATSSA Prevalence of disability in South Africa. http://www.statssa.gov.za/census/census_2001/disability/Disability.pdf (accessed August 2015).

23. STATSSA Community Survey, 2007. http://www.statssa.gov.za/publications/P0301/P0301.pdf (accessed July 2015).

24. NDoH, Integrated National Disability Strategy White Paper. Health, Depertment of Health., Ed. Pretoria, 1997.

25. Lansdown G. Disabled Children in South Africa: Progress in implementing the Convention on the Rights of the Child. *Rights for Disabled Children* **2002**.

26. NDoH, South African Demographic Health and Survey Health, D. o., Ed. Pretoria, 2003.

27. Johnson J, Woll J. A national disgrace: health disparities encountered by persons with disabilities. *Disability Studies Quarterly* **2003,** *23* (1).

28 .Armour B S, Swanson M, Waldman H B, Perlman S P. A profile of state-level differences in the oral health of people with and without disabilities, in the US, in 2004. *Public health reports* **2008,** *123* (1), 67.

29. Petersen P E. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century–the approach of the WHO Global Oral Health Programme. *Community Dentistry and oral epidemiology* **2003,** *31* (s1), 3-24.

30. Petersen P E, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bulletin of the World Health Organization* **2005,** *83* (9), 661-669.

31. Beil H, Mayer M, Rozier R G. Dental care utilization and expenditures in children with special health care needs. *The Journal of the American Dental Association* **2009,** *140* (9), 1147-1155.

32. White J, Beltran E, Malvitz D, Perlman S. Oral health status of special athletes in the San Francisco Bay Area. *Journal of the California Dental Association* **1998,** *26* (5), 347-354.

33. Pezzementi M L, Fisher M A. Oral health status of people with intellectual disabilities in the south eastern United States. *The Journal of the American Dental Association* **2005,** *136* (7), 903-912.

34. Miller C E. Preventing dental disease for people with special needs: the need for practical preventive protocols for use in community settings. *Special Care in Dentistry* **2003,** *23* (5), 165-167.

35. Reid B C, Chenette R, Macek M D. Prevalence and predictors of untreated caries and oral pain among Special Olympic athletes. *Special Care in Dentistry* **2003,** *23* (4), 139-142.

36. Reidpath D D, Allotey P. Infant mortality rate as an indicator of population health. *Journal of epidemiology and community health* **2003,** *57* (5), 344-6.

37. Turner S, Sweeney M, Kennedy ; Macpherson L. The oral health of people with intellectual disability participating in the UK Special Olympics. *Journal of Intellectual Disability Research* **2008,** *52* (1), 29-36.

38. Lopez del Valle L M, Waldman H B, Perlman S P. Puerto Rican athletes with special health care needs: an evaluation of oral health status. *Journal of dentistry for children (Chicago, Ill.)* **2007,** *74* (2), 130-2.

39.Oredugba F A, Perlman S P. Oral health condition and treatment needs of Special Olympics athletes in Nigeria. *Special care in dentistry : official publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry* **2010,** *30* (5), 211-7.

40. Benhamgar L, Leclercq M-Hl, Bourgeois D, McCombie B, Barmes D . Standard descriptive tables in WHO oral health epidemiological studies. **1994**.

41. Dellavia C, Allievi C, Pallavera A, Rosati R Sforza C. Oral health conditions in Italian Special Olympics athletes. *Special Care in Dentistry* **2009,** *29* (2), 69-74.

42. Nqcobo C, Yengopal V, Rudolph M, Thekiso M, Joosab Z. Dental caries prevalence in children attending special needs schools in Johannesburg, Gauteng Province, South Africa: research. **2012**.

43.Alaki S M, Bakry N S. Dental pain in children with intellectual disabilities: caregivers' perspective. *International journal of dentistry* **2012,** *2012*.

44.WHO Significant caries Index, 2008

http://www.whocollab.od.mah.se/sicdata.html (accessed November 2015)

45. Singh S, Myburgh N G, Lalloo R. Policy analysis of oral health promotion in South Africa. *Global health promotion* **2010,** *17* (1), 16-24.

46. Morgan J P, Minihan P M, Stark P C, Finkelman M D, Yantsides K E, Park A, Nobles C J, Tao W, Must A. The oral health status of 4,732 adults with intellectual and developmental disabilities. *The Journal of the American Dental Association* **2012,** *143* (8), 838-846.

47. Thema L. Integrated primary oral health services in South Africa: The role of the PHC nurse in providing oral health examination and education *African Journal of Primary Health Care & Family Medicine Vol 5, No 1 (2013), 4 pages. doi:* **2013,** *5* (1).

APPENDICES

APPENDIX I: SCREENING FORM





Date : 24 September 2008	**O Male O Female**	**DoB:**	**Age (years) O Not sure**
Event	Location : Elandsdoorn Sports Grounds	O Athlete O Unified partner	Sport
Delegation :		SO Program	
Ethnic group			
Screener's name		Examiner Code:	

Dental History

1. Fill out this section for each athlete even if edentulous

How often do you clean your mouth?

O Once or more a day

O 2 to 6 times per week

O Once per week

O Less than once per week

O Not sure

2. Pain inside mouth

O Yes O No

☐ Teeth

☐ Other

3. O **Athlete refused/could not screen**

4. Extra Oral and Intra Oral Examination

4.1 Extra Oral Examination

Facial symmetry: Symmetrical ☐ Asymmetrical ☐

Skin colour_____

Lesions/swellings_____

Lymph nodes:

Submandibular _____

Sublingual _____

Pre- & Postauricular_____

Eyes: _____

TMJ:

Crepitus_____

Clicking_____

Pain_____

Malocclusion (Angle's classification)

I ☐

II ☐

III ☐

4.2 Intra Oral Examination

Lips_____
Frenum_____
Buccal mucosa_____
Palate _____
Tonsils _____
Tongue_____
Tori _____
Floor of Mouth _____

5. Dental Caries and Treatment Need – Adult and Child

		O/I	B	M	L	D	Rt	T			O/I	B	M	L	D	Rt	T
	18									48							
	17									47							
	16									46							
55	15								85	45							
54	14								84	44							
53	13								83	43							
52	12								82	42							
51	11								81	41							
61	21								71	31							
62	22								72	32							
63	23								73	33							
64	24								74	34							
65	25								75	35							
	26									36							
	27									37							
	28									38							

STATUS

Permanent teeth
0 = Sound
1 = Decayed
2 = Filled
3 = Filled and decayed
4 = Missing due to caries
5 = Missing, any other reason
6 = Sealant, varnish
7 = Bridge abutment or special crown
8 = Unerupted tooth
9 = Excluded tooth
10 = Fracture
11 = Other

Primary teeth
A
B
C
D
E

F
G

H
I

TREATMENT

0 = None
1 = Caries arresting or sealant care
2 = One surface filling
3 = Two or more surface filling
4 = Crown or bridge abutment
5 = Bridge element
6 = Pulp care
7 = Extraction
8 = Need for other care……

6. DMFT (Klein, Palmer and Knutson)

D	M	F	DMFT

7. DMFS (Klein, Palmer and Knutson)

D	M	S	DMFS

8. Plaque Index (Silness and Loe)

B				
L				
	16	11		24
	44	41		36
L				
B				

0=none

1=<1/3

2=>1/3

9=Not recorded

9. Gingival Index (Loe and Silness)

B				
L				
	16	11		24
	44	41		36
L				
B				

0=normal gingiva

1=mild marginal gingivitis, slight colour change and oedema

2=moderate gingival inflammation, redness and glazing

3=a distinct red band along the marginal gingiva from papilla to papilla

4=severe inflammation, marked redness and oedema, with ulceration or spontaneous bleeding

10. History of oral problems

10.1	Have you ever had any sores/ulcers in your mouth?	Yes	No	Don't know
10.2	If yes, what problem, sores, ulcers did you have?			
10.3	If yes, when did you have them?			
10.4	If yes did they cause you pain or discomfort?	Yes	No	Don't know
10.5	If yes, please explain how			
10.6	Are you having any pain or discomfort with your mouth now?	Yes	No	Don't know
10.7	If yes, please explain			
10.8	If yes, is this pain/discomfort causing difficulty with:			
10.8.1	Eating	Yes	No	Don't know
10.8.2	Drinking	Yes	No	Don't know
10.8.3	Swallowing	Yes	No	Don't know
10.8.4	Speaking	Yes	No	Don't know
10.8.5	Working	Yes	No	Don't know
10.8.6	Sleeping	Yes	No	Don't know
10.8.7	Other (specify)	Yes	No	Don't know

11. Screening

11.1 Edentulous

O Yes **(-> stop here)** ☐ **Exam completed**

O No **(answer all questions 5 thru 14)**

11.2 Untreated decay

O Yes O No

☐ Anterior(s)

☐ Premolar(s)

☐ Molar(s)

11.3 Filled teeth

O Yes O No

11.4 Missing teeth

O Yes O No

☐ Anterior(s)

☐ Molar(s)

11.5 Sealant(s)

O Yes O No

11.6 Injury

O Yes O No

11.7 Fluorosis

O Yes O No

11.8 Gingival signs

O Yes O No

11.9 Treatment urgency

O Maintenance

O Non-urgent

O Urgent

11.10 Mouthguard recommended

O Yes O No

☐ Mouthguard delivered

11.11 ☐ Exam completed

APPENDIX II: SPECIAL OLYMPICS CONSENT

Special Olympics
South Africa

Faculty of Health Sciences
Ethics Clearing Committee
University of the Witwatersrand
Johannesburg

19 September 2011

To whom it may concern:

I hereby give permission for the retrospective and prospective use of all data stemming from Special Olympics Special Smiles screenings in South Africa from 2008 onwards.

The dental screening form has been approved by Special Olympics International as non-invasive and consent has been received from the participants to have their data used anonymously.

For further queries, please contact me on the following numbers: 011 783 8533 or via Annemarie@specialolympics.org.za

Sincerely,

Annemarie van Wieringen
Chief Executive Officer
Special Olympics South Africa

Dr. Mathews Phosa
Chairman

Dr. Danisa Baloyi
Deputy Chairperson

3rd Floor Twin Towers West, Sandton City, Cnr 5th and Rivonia Roads, Johannesburg, South Africa, 2196
+(27) 11 783 8533 (T) / +(27) 11 783 8510 (F)
Created by the Joseph P. Kennedy, Jr. Foundation for the Benefit of Persons with Intellectual Disabilities
www.specialolympics.org / info@specialolympics.org.za

APPENDIX III: ETHICS CLEARANCE CERTIFICATE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Dr IMN Mokhine

CLEARANCE CERTIFICATE	**M120266**
PROJECT	Oral Health Status of Special Olympics Athletes in South Africa
INVESTIGATORS	Dr IMN Mokhine.
DEPARTMENT	Paeds & Restorative Dentistry
DATE CONSIDERED	24/02/2012
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 24/02/2012 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Prof MJ Rudolph

DECLARATION OF INVESTIGATOR(S)
To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...