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A framework for integrated school oral health promotion within the Health Promoting Schools Initiative in KwaZulu-Natal

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A framework for integrated school oral health promotion within the Health Promoting Schools Initiative in KwaZulu-Natal

Moganavelli Reddy

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A thesis submitted to the Discipline of Dentistry, Faculty of Health Sciences, University of KwaZulu-Natal, Westville, for the degree of Doctor of Philosophy in Health Sciences.

This thesis is presented in a manuscript format. This presentation comprises of seven chapters which include an Introduction, Literature Review, Conceptual Framework, Methodology, Results and Discussion, Manuscript Presentation and Conclusions and Recommendations. The first and second manuscripts have been published in peer-reviewed journals and the third manuscript is under review.

This is to certify that the contents of this thesis are the original research work of Ms Moganavelli Reddy.

As the candidate's supervisor, I have approved this thesis for submission.

Supervisor:

Signed:  Date: 07 April 2016

Dr S. Singh

ABSTRACT

Introduction

Schools can provide a perfect setting for the implementation of health and oral health promotion activities. However, a change in focus was needed at schools from the traditional topic-based approach to health education to a more holistic approach to health and oral health promotion. The Health Promoting School Initiative provides an integrated, holistic, collaborative and co-ordinated approach to health. This initiative can therefore provide a platform for the integration of oral health promotion activities within health promotion activities at these schools. However, the extent to which oral health promotion is incorporated into health promotion activities and whether oral health ,promotion programmes have been implemented at these schools is unclear in South Africa.

Aim

This study set out to develop a framework to use a systematic approach to critically assess the viability of including oral health promotion elements within the Health Promoting School Initiative to establish the appropriateness of this mechanism for school-based oral health service delivery.

Methods

This study was explorative and since the integration of oral health promotion into the school programme is multifaceted, a combination of both qualitative and quantitative data was collected. It was conducted in three phases. Qualitative data was obtained through indepth interviews and self administered questionnaires in the first phase of the study. The second phase of the study comprised of the implementation of an intervention based on the findings in the first phase of the study. The third phase of the study obtained qualitative data using focus group discussions.

A situational analysis was conducted in the first phase of the study. All policy documents, strategic plans and reports from the national and provincial departments of health and education that were relevant to oral health were reviewed in this study. The purpose of this was to ascertain priorities and strategies for oral health promotion at schools. Quantitative data was obtained using the World Health Organization Decayed Missing Filled Teeth (WHO DMFT) Tool to determine dental needs of the learners. A self administered questionnaire and data capture sheet was also included. Quantitative data were quantified according to codes, and verified. The data was analysed with SPSS version 21.0. Inferential techniques used for data analysis included correlations and chi-square test values which were interpreted using p-values.

The transcription obtained from interviews in Phase 1 and focus group discussions in Phase 3, and qualitative responses to the questionnaire were analysed separately. Responses from interviews and focus group discussions were first transcribed verbatim and organised according to the questions. The raw data was then checked and verified for quality purposes. Triangulation was used for evaluation of the data. Thematic data analysis using inductive and iterative techniques was used for qualitative data. Open coding, axial coding and selective coding was used to analyse the data.

Objectives

1. To identify current policies or priorities for health promotion and oral health promotion in policies, strategic plans and annual reports of the Department of Health and Department of Education.
2. To conduct a situational analysis of existing services and an epidemiological profile to determine unmet oral health needs of six year old learners at the selected Health Promoting Schools in KwaZulu-Natal using a questionnaire, interview schedule, data capture sheet and the WHO DMFT Tool.
3. To determine the presence or absence of school based oral health promotion programmes at the selected schools using a questionnaire and interview schedule.
4. To introduce oral health promotion programmes in schools where there are no or interrupted oral health service delivery to determine the feasibility of these programmes.
5. To determine the opportunities and barriers for the incorporation of oral health promotion within the Health Promoting School Initiative through focus group discussions.
6. To compare this programme to schools that have existing oral health promotion programmes.

Results and Discussion

The results obtained in the three phases of the study were integrated, discussed and then coherently presented in this chapter. The qualitative and quantitative data obtained from Appendices 1, 2, 3, 4 and 5 are described and discussed in accordance with objectives 1, 2 and 5 of the study. The inextricable link between these objectives is demonstrated appropriately throughout the analysis. Four salient themes emanated from the data. These themes were aligned to objectives 1, 2 and 5 of the study. The data are presented as categories that are linked into a framework of consistent behaviour, connections and consequences that are relevant to a particular phenomenon.

The framework used to guide this study provided a systematic and negotiated approach to the planning, implementation and review of the oral health promotion intervention to achieve the desired goals in an appropriate period of time. The framework also provided a multi-level approach for oral health care delivery that included macro, meso and micro influences. The framework identified critical areas for assessment for those involved in planning and implementing integrated school health

programmes. Potential target areas for oral health promotion interventions were also identified. Processes that advocate and encourage social cohesion, partnership development and resource sharing were also identified. Process evaluation investigated how well the planned intervention had been implemented. It also identified the factors that facilitated or impeded the implementation.

In this study, 27% of the six year old children were caries-free giving a caries rate of 73%. The mean dmft for the study sample was 3.65. The average dmft per school ranged from a high of 6.8 to a low of 1.1 with both these extremes recorded in the rural districts. Overall 94% of the learners required some type of treatment with the majority (90%) requiring preventive care. The Unmet Treatment Need (UTN) was 97%.

Although the Health Promoting School Initiative was chosen because it provides a supportive environment to improve health, several barriers were present for the successful integration of oral health promotion into this initiative. The study findings indicated an absence of oral health promotion initiatives in the curriculum. Educators also noted that they were restricted to what was prescribed in the curriculum and therefore found it difficult to include oral health promotion as suggested by the researcher. Additionally, almost 70% of study participants (educators) lacked knowledge and skills in oral health promotion. This resulted in a lack of confidence in the implementation of an oral health promotion programme. The study findings also noted a lack of in-service training provided in oral health promotion to educators. These factors therefore impacted on the integration of oral health promotion into the school programme.

It was further noted that if oral health promotion activities such as tooth brushing and fluoride rinses are included in the school programme, this would have implications in terms of time management for educators as these activities would encroach upon their teaching time. Sustainability of these activities would also be a problem as a result of inadequate resources, funding, knowledge and supporting structures.

The study findings indicate that the barriers identified in this study are similar to what has been reported more than ten years ago. This implies that although the Department of Health in collaboration with the Department of Education has adopted the Health Promoting School Initiative, they have not provided the necessary resources to sustain these programmes. It was therefore suggested that a multilayered approach to health and oral health promotion be implemented as opposed to a blanket programme so that a greater mix of available strategies could be considered from district to district.

Although there were many limitations to this programme some benefits were identified. All (100%) participants identified the importance of the inclusion of oral health promotion into the curriculum, especially in rural areas. Educators at two schools (15%) were of the opinion that oral health education should be reinforced in the curriculum by introducing examples and activities. Some educators (46%) also felt that this programme was of benefit to them as it had created awareness to oral health. This therefore empowered educators to take control of the programme by creating awareness to the importance of oral health and providing guidance on the implementation of the programme.

Conclusions and Recommendations

The aim was achieved by developing and using a conceptual framework to integrate oral health promotion within the context of the Health Promoting Schools Initiative. This framework provided a systematic and negotiated approach for the planning, implementation and review of the oral health promotion intervention based on the needs of the six year old learners at the identified schools. The strength of this framework was underpinned in its multi-level approach to ensure quality of oral health care delivery. The limitations of this framework were that it was not tested for effectiveness to bring about behaviour change as this was a long term goal. Additionally, the cost-effectiveness of this framework was not investigated.

Although current policies and strategic plans (100%) in South Africa and KwaZulu-Natal have prioritised primary prevention and promotion, integrated approach and the common risk factor approach, study findings indicate that not all these strategies have been translated into practice. This therefore suggests that current oral health services are inconsistent and fragmented.

Currently there is inequality and inequity in the delivery of oral health services in schools. Strategies for oral health promotion have not been translated into practice indicating that oral health services are currently not properly aligned. Lack of collaboration between the Department of Health and Department of Education has resulted in a lack of coordination between the Health Promoting Schools Initiative and School Health Services in terms of policy and guidelines with education policies and guidelines. It was established from research findings that oral health promotion is not incorporated into general health promotion in the school curriculum.

Current water supplies and sanitation are still inadequate (50%) in rural schools. Although most (71.4%) of the schools in the rural areas have access to a community clinic, resources are limited and poor road conditions and transport prevent attendance at these clinics. The majority (87%) of the schools currently have limited control over what is being sold at their tuck shops and by vendors.

There is also a lack of support from the Department of Education in terms of funding for oral health promotion programmes.

An increase in the prevalence of dental caries suggests that this has not been adequately addressed in KwaZulu-Natal. The decrease in fillings suggests that there is a decrease in oral health service provision for restorative procedures. There is therefore a need for improvement in oral health service delivery.

As a result of the current focus being on policy formulation and not the translation of policy into sustainable programmes, it was recommended that there was a need for multiple stakeholder involvement in policy monitoring with specific strategies for implementation and evaluation of oral health promotion activities. There was also a need to ensure stakeholder involvement in the development of oral health learning material at school level. More research needs to be done to explore the mechanism to support and address inequity in oral health promotion related service delivery at schools and to test the adaptability of the framework in other health related settings both provincially and nationally.

DECLARATION 1 – PLAGIARISM

I, Moganavelli Reddy, declare that

1. The research reported in this thesis, except where otherwise indicated, is my original work.
2. This thesis has not been submitted for any degree or examination at any other university.
3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
4. This thesis does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted:
    a. Their words have been re-written, but the general information attributed to them has been referenced.
    b. Where their exact words have been used, then their writing has been placed in italics and inside quotation marks, and referenced.
5. This thesis does not contain text, graphics or tables copied from the Internet, unless specifically acknowledged, and the source being detailed in the thesis and in the references section.

   A detail contribution to publications that form part and/or include research presented in this thesis is stated (include publications submitted, accepted, in press and published).

Signed

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DECLARATION 2 – LIST OF PUBLICATIONS

1. Reddy, M., Singh, S. Viability in delivering oral health promotion activities within the Health Promoting Schools Initiative in KwaZulu-Natal. South African Journal of Child Health 2015; 9(3):93-97.

   Contribution:
   Moganavelli Reddy: Author – contributed to the project by performing all literature reviews, data collection and data analysis, interpretation of the results as well as manuscript preparation and writing.
   Shenuka Singh: Supervisor

2. Reddy, M., Singh, S. Dental caries status in six-year-old children at Health Promoting Schools in KwaZulu-Natal, South Africa. South African Dental Journal 2015; 70(9):396-401

   Contribution:
   Moganavelli Reddy: Author – contributed to the project by performing all literature reviews, data collection and data analysis, interpretation of the results as well as manuscript preparation and writing.
   Shenuka Singh: Supervisor

3. Reddy, M., Singh, S. The promotion of oral health within the Health Promoting Schools in KwaZulu-Natal. **(Submitted for review with South African Journal of Child Health)**

   Contribution:
   Moganavelli Reddy: Author – contributed to the project by performing all literature reviews, data collection and data analysis, interpretation of the results as well as manuscript preparation and writing.
   Shenuka Singh: Supervisor

RESEARCH OUTPUT

A. PUBLICATIONS

1. Reddy, M., Singh, S. Viability in delivering oral health promotion activities within the Health Promoting Schools Initiative in KwaZulu-Natal. South African Journal of Child Health 2015; 9(3):93-97.

2. Reddy, M., Singh, S. Dental caries status in six-year-old children at Health Promoting Schools in KwaZulu-Natal, South Africa. South African Dental Journal 2015; 70(9):396-401

B. CONFERENCES

1. Poster presentation "A situational analysis of the viability of delivering oral health promotion activities within the Health Promoting Schools Initiative in KwaZulu-Natal" – College of Health Sciences Research Symposium 2014, September 11-12, 2014 – University of KwaZulu-Natal – Won Staff Poster – International Category (R30 000) – to attend international conference.

2. Poster presentation "A situational analysis of the viability of delivering oral health promotion activities within the Health Promoting Schools Initiative in KwaZulu-Natal" – 3rd Euro Congress and Expo on Dental and Oral Health, June 16-18, 2015 – Alicante Spain.

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CONTENTS

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List of Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
ANUG	Acute Necrotising Ulcerative Gingivitis
BASCD	British Association for the study of Community Dentistry
DMFT	Decayed, Filled, Missing Teeth
HEBS	Health Education Board for Scotland
HIV	Human Immunodeficiency Virus
HPS	Health Promoting School
IUHPE	International Union for Health Promotion and Education
UTN	Unmet Treatment Need
WHO	World Health Organization

CHAPTER 1
INTRODUCTION TO THE STUDY

1.1 Introduction

The association between health and daily settings of individuals was identified at the First International Conference on Health Promotion in 1986 and subsequently highlighted in the Ottawa Charter (World Health Organization, 1986):

"Health is created and lived by people within the settings of their everyday life; where they learn, work, play and love. Health is created by caring for oneself and others, by being able to make decisions and have control over one's life circumstances, and by ensuring that the society one lives in creates conditions that allow the attainment of health by all its members" (World Health Organization, 1986:3).

A strategy that has evolved from the concept of the 'settings approach' and launched by the World Health Organization (WHO) in 1995 is the Health Promoting School (World Health Organization, 1996b, Baric, 1993, World Health Organization, 1984). It is defined *"as a school that is constantly strengthening its capacity as a healthy setting for living, learning and working. Health Promoting School communities make a positive contribution to health and learning outcomes through the interrelationship of three important areas: curriculum, teaching and learning practices; school organisation, ethos and environment; partnerships and services"* (World Health Organization, 2003b:3). This holistic approach encompasses an extensive health education curriculum that is upheld by the school ethos and environment. The Health Promoting School therefore does not only focus on behavioural changes of learners but prioritises changes in its organisation and policy. This would entail improvements in curriculum, methods of teaching and learning in addition to the physical and social environments of the school. This supportive environment for health therefore improves health literacy. This is achieved by assisting learners improve their management of the determinants of health whilst building their personal, cognitive and social skills for the maintenance of good health (Lee, 2009, Bandura, 1998).

Most high risk behaviours adopted by learners early in life affect their health later in life. The Health Promoting School therefore provides a platform to empower learners to make informed decisions about their health early in life by educating them about disease prevention and health promotion (Elfituri, 2011). The school setting is therefore considered effective as school based programmes can reach over a billion learners globally. Moreover, it has a positive impact on the health of educators,

families and the community (Department of Education and Early Childhood Development, 2014, St. Leger, 1999, World Health Organization, 1996c). This setting has therefore been identified as the most creative and cost-effective way for the improvement of health, including oral health, thereby improving the quality of life (Petersen, 2004a, Veiga et al., 2015).

Oral health, an integral component of general health, is considered a basic human right. The high burden of oral diseases currently experienced worldwide impacts severely on public health as the cost of treatment is high (Petersen and Kwan, 2010, World Health Organization, 2006a). Many oral diseases are preventable and can be reversed in the early stages of disease (Kwan et al., 2005). There are many risk factors associated with oral diseases, some of which are shared with common non-communicable diseases. These modifiable risk factors that are related to lifestyle include tobacco use, the consumption of alcohol and an unhealthy diet (Steyn and Damasceno, 2006, Petersen, 2003). Therefore, one of the oral health strategies recommended by the World Health Organization for oral health promotion and disease prevention was an integrated approach to oral and general health using the common risk factor (Petersen and Kwan, 2009, Petersen, 2004a).

This strategy was also adopted by the African countries including the Department of Health in South Africa. Consideration was therefore given to the integration of oral health promotion programmes into existing general health promotion programmes (World Health Organization, 2006a). The Health Promoting School framework that provided an integrated, holistic, collaborative and co-ordinated approach to health and oral health promotion was therefore adopted by South Africa (Kirsten et al., 2009, Department of Health: Health Promotion, 2000, Ogunbodede et al., 1999). Current evidence in a number of countries has demonstrated that the Health Promoting School model has a positive impact on the lives of children and their community by changing their attitudes to health thereby reducing the burden of disease (World Health Organization, 1998a, World Health Organization, 1997c). This would ultimately reduce costs for healthcare in the long term (Macnab, 2013).

However, many gaps still exist worldwide, including South Africa, that affect the sustainability of school health programmes. These include unavailability of long-term funding, absence of vision and strategic planning, lack of ownership and resources, time constraints and a lack of support and collaboration from the education sector. In addition, the sustainability of these programmes have not been evaluated (Petersen and Kwan, 2010). For effective oral health promotion interventions, oral disease profiles which are not identical across communities, would have to be investigated to ensure that interventions implemented are based on the local needs of the individual communities (Myburgh et al., 2004). Dental caries in particular, is one of the most common conditions affecting children in South Africa and therefore needs to be addressed (Hamissi, 2012, National Department of Health and all Oral Health Stakeholders, 2010). However, current health inequities between and within provinces

needs to be taken into consideration prior to the implementation of any programmes (Coovadia et al., 2009). This would therefore entail acquiring evidence on the effects of social determinants on oral health to inform public policies in order to ensure success in implemented oral health promotion interventions (Petersen, 2009, Petersen, 2008, Watt et al., 2001).

1.2 Problem statement

Evidence in the literature suggests that current health and oral health services in South Africa has been affected by previous discriminations and inequities that have prevailed in the apartheid era (Coovadia et al., 2009). Consequently these factors that now affect the post apartheid population need to be addressed prior to the development and execution of any interventions (World Health Organization, 2004b). This would mean that new strategies and interventions would have to be based on the socio-economic status of the populations for them to be effective (van Wyk and van Wyk, 2010). However, literature searches have revealed a paucity of information on oral health service delivery in KwaZulu-Natal. Moreover, current oral health promotion service deliveries are interrupted due to constraints in human resources in the public sector as less than 20% of oral health practitioners' work in the public sector (Department of Health, 2003b). This has therefore had a negative impact on the sustainability of school-based oral health promotion programmes (Department of Health - KwaZulu-Natal, 2012) .

A further limitation reviewed in the literature is that current strategies to oral health have failed to recognise the oral health needs of the population at a district level (Myburgh et al., 2004, World Health Organization, 1998e). This applies to South Africa, especially KwaZulu-Natal, as currently there is a paucity of epidemiological information available to inform oral health promotion programmes (Singh, 2011, van Wyk and van Wyk, 2010). A number of studies have been conducted in South Africa, but most have focused on dental caries in children with only a few studies designed for the adult population. Data obtained from the three national studies conducted in South Africa included dental caries, periodontal diseases, edentulousness, malocclusion and dental fluorosis (van Wyk and van Wyk, 2004, Department of Health, 2003c). However, these national results do not address the local needs of the communities (World Health Organization, 2001, Lalloo et al., 1999). Therefore, the relevance of current data is questionable as new interventions that are implemented, such as school-based preventive and promotive programmes, may not apply to the present situation.

Comprehensive preventive and promotive school-based oral health programmes have been prioritised by the Department of Health to address the oral health needs of children in KwaZulu-Natal. (Department of Health - KwaZulu-Natal, 2012, Department of Health and Basic Education, 2012). Evidence in literature suggests that well planned integrated school oral health programmes could

promote healthy behaviours in children (St. Leger, 1999, Green and Kreuter, 1991). However, an evidence-based approach would be required for effectiveness and efficiency (Mc Queen and Jones, 2007, Rychetnik and Wise, 2004). This would therefore require the use of multiple theories and models for the development of a framework for school-based interventions. Although school-based oral health promotion programmes have been prioritised in KwaZulu-Natal, there is currently no evidence of frameworks for the implementation of these programmes or evidence that they have been evaluated. Moreover, there is no evidence that these interventions are based on the needs of the learners. Current reports indicate the provision of school-based oral health promotion programmes (Department of Health - KwaZulu-Natal, 2012). However there is no evidence of the adoption of a systematic approach. It would therefore seem that current programmes are haphazard, inconsistent and fragmented.

1.3 Purpose of the study

The complex practice of health promotion would require multilevel and comprehensive interventions for the development of effective programs. Theories are therefore needed for the support of multilevel interventions so that reliable outcomes can be produced (Raingruber, 2013). Theories assist in explaining the necessity of an intervention, how to conduct the intervention and then evaluate for success (Glanz and Rimer, 2005). For quality studies, it is important to ensure that the evaluation methodologies used consider both process and outcome measures based on a sound theoretical framework (Green, 2000).

The focus on outcomes and effectiveness is imperative to inform strategic planners and policy makers (Wimbush and Watson, 2000). For effectiveness, indicators would have to be developed. However, these indicators would have to be placed within a framework that would permit the link between the planned action and desired outcome over a period of time (Ralls and Thomson, 2000). Frameworks proposed for health promotion are based on the idea that changes occur over a period of time and that time dimensions therefore need to be used for the differentiation of outcomes. They also suggest that various actions aimed at different levels are required for health promotion interventions.

A strategy developed to promote health was the ‘settings approach’ which focuses on systems and organisations compared to the previous individualistic approach to health (Baric, 1993, Tannahill, 1990). The school as a ‘setting’ therefore provides an effective platform for health and oral health promotion activities reaching over a billion children globally (Kwan et al., 2005). These activities can also benefit the health and well-being of school staff, parents and community members (Kwan et al., 2005, St. Leger, 1999, World Health Organization, 1996c). Schools as a setting offer children and adolescents the opportunity to improve their health by shaping their behaviours and social values (International Union for Health Promotion and Education, 2009, St. Leger, 1999). In order to assist

the school in addressing health issues, the concept of the Health Promoting School was developed to provide a multifaceted approach to school health (Lee et al., 2003, Stewart-Brown, 2001, St. Leger, 1999).

The Health Promoting School focuses on the learners and communities ability to understand and influence their lifestyle and living conditions (Barnekow, 2006). This approach facilitates the development of policies for health, improves the physical and social environment of the school that includes the curriculum and methods of teaching and learning (St Leger et al., 2010, World Health Organization, 1999). Evidence in the literature suggests that the Health Promoting Schools Initiative has shown improvement in the health and well-being of the entire school community (Valois et al., 2011, Buijs, 2009).

This approach differed from the traditional schools. Health promotion at these schools was more school-based. Formal instructions were given on health education and health issues were addressed individually and according to the needs of the learners. Additionally, programmes were planned in isolation of normal school planning and development (National Health and Medical Research Council, 1996, Young and Williams, 1989). With structures and systems already in place, the Health Promoting School was therefore chosen over the traditional schools for the implementation of the programme.

Evidence-based practice has been advocated to improve the quality and cost-effectiveness of interventions for health promotion (Rychetnik and Wise, 2004, Green, 2000). Evidence in the literature suggests that empirical evidence cannot be used in isolation to direct practice and that an alternate approach would be required. It was therefore suggested that a more descriptive and analytical process using theory was imperative for programme and evaluation designs to improve understanding of complex situations. Moreover, these understandings would need to be responsive to contextual factors and be informed by the experience of practitioners and communities (Green, 2000).

Many countries including South Africa have adopted an evidence-based approach to health promotion (Department of Health, 2010a, Lynagh et al., 2002, Green, 2000). Policy makers and programme planners would therefore have to make informed decisions when drawing up policies and planning programmes. This would therefore require high quality evaluations to inform decision makers on the most effective and efficient programmes to implement for target populations (Davies and Macdowall, 2006).

As noted in Section 1.2 there is a lack of evidence on a systematic approach to current school-based oral health promotion programmes. Furthermore, the current delivery of oral health services in

KwaZulu-Natal is not sustainable due to huge constraints in human resources, lack of resources for oral health services and budgetary constraints (Department of Health - KwaZulu-Natal, 2012, Singh et al., 2010). Moreover, oral diseases and conditions, which have become a major public health concern in South Africa due to their high cost of treatment, further impacts on oral health service delivery (Department of Health, 2010a). Many oral diseases can be prevented or improved through behavioural changes if children are provided with basic knowledge and skills in health care practices in the formative years of their lives (Jurgensen and Petersen, 2013, Petersen, 2004b).

The purpose of this study was to provide a systematic approach to addressing oral health promotion planning, implementation and evaluation within the school setting.

The value of this approach would be more a cost-effective strategy compared to major investments in oral health services, training of relevant oral health practitioners or the building of new infrastructure (Macnab, 2015). The significance of using the Health Promoting Schools for this programme is its ability to reach the wider community (World Health Organization, 2003b). It is therefore hoped that by incorporating oral health promotion into schools, the benefits of this preventive approach would reach the community thereby lessening dependence on oral health services. This would therefore be a more affordable approach compared to the high cost of treatment (Sparks, 2013).

By using a clearly defined planning and implementation framework, the study hopes to provide a uniform and transparent process for funding and human resource allocation based on local oral health unmet need.

The purpose of creating a framework for an integrated approach to oral health promotion at schools based on the needs of the learners was to ensure that it was contextual and grounded in sound theoretical models (Kwan et al., 2005). The benefit of using this approach is that it could add value to oral health service delivery by ensuring more effective, efficient and sustainable oral health interventions (Petersen and Kwan, 2004). This framework could provide opportunities for the community and other stakeholders to participate in the planning and implementation of programmes (Gilliam et al., 2002). This could therefore provide a mechanism for the shared responsibility for oral health care. The involvement of communities and other stakeholders could further contribute to ensuring sustainability of oral health promotion programmes (Kwan et al., 2005).

It is hoped that the benefits of using this framework would add value to future health and oral health promotion planning in the Department of Health. It is anticipated that this framework could also be used for existing programmes in the Department of Health in addition to being applied in other

settings. The results obtained in this study would therefore have implications for future human resource requirements and resource allocations in the Department of Health.

A short term evaluation and monitoring of the implemented programme was conducted to explore whether this approach could substitute or complement service delivery. It is hoped that these study findings would contribute to learning and knowledge acquisition by informing future curriculum planning, undergraduate learning and service delivery.

As there are currently very few Health Promoting Schools in KwaZulu-Natal, it is hoped that this framework could also be extended to traditional schools so that more children, especially the disadvantaged, can be reached. This study also hopes that the developed framework can be adapted to other settings both locally and nationally.

1.4 Research Questions

1. What is the current context of oral health service delivery at health promoting schools in KwaZulu-Natal?
2. Is oral health service delivery aligned to the Integrated School Health Policy and Oral Health Strategy?
3. Is there coordination between the Health Promoting Schools, School Health Services and Department of Education policies and guidelines?
4. Is there incorporation of oral health promotion into general health promotion in the school curriculum and teaching practices of the Health Promoting School?
5. What are the opportunities and barriers for the incorporation of oral health promotion activities within the Health Promoting School Initiative?

1.5 Aim and Objectives

Aim

To develop a framework to assess the viability of integrating oral health promotion activities within the Health Promoting School Initiative and to establish the appropriateness of this framework as a mechanism for school-based oral health service delivery.

Objectives

1. To identify current policies or priorities for health promotion and oral health promotion in policies, strategic plans and annual reports of the Department of Health and Department of Education.
2. To conduct a situational analysis of existing services and an epidemiological profile to determine unmet oral health needs of six year old learners at the selected Health Promoting Schools in KwaZulu-Natal using a questionnaire, interview schedule, data capture sheet and the WHO DMFT Tool.
3. To determine the presence or absence of school based oral health promotion programmes at the selected schools using a questionnaire and interview schedule.
4. To introduce oral health promotion programmes in schools where there are no or interrupted oral health service delivery to determine the feasibility of these programmes.
5. To determine the opportunities and barriers for the incorporation of oral health promotion within the Health Promoting School Initiative through focus group discussions.
6. To compare the findings of this programme to that of schools having existing oral health promotion programmes.

1.6 Research assumptions made in this study

The focus of the study is on the planning framework and its feasibility in addressing the various components of oral health planning and implementation. The study used a systematic approach for the planning and implementation of the programme. The focus of the study was on issues associated with feasibility, implementation and monitoring but did focus on effectiveness, health outcomes or health outputs.

Several assumptions have been identified for this study.

1. The philosophy of Health Promoting Schools is designed to develop competencies in understanding and influencing lifestyles and living conditions of children and young people. It is assumed that this approach enhances community health and oral health.
2. The settings approach is crucial in driving the process of health and oral health promotion activities therefore the school will provide a significant platform for health and oral health programmes.
3. Integration of oral health promotion elements is supported in health policy documents in South Africa. This is in line with the World Health Organization recommendations and therefore integration is important.

4. Oral health care is fragmented and not properly integrated within the School Health Services in KwaZulu-Natal.

1.7 Format of the Thesis

This thesis adopted the manuscript approach. An overview of the chapters is presented below.

Chapter 1: Introduction

This chapter provided a background to the incorporation of oral health promotion into the Health Promoting Schools Initiative. The Health Promoting Schools Initiative, which is one of the strategies that has evolved from the concept of the 'settings approach', is introduced. An integrated approach to oral health promotion at Health Promoting Schools using the common risk factor is then discussed followed by the successes and limitations of this initiative. A brief background to the current status of the delivery of oral health services in KwaZulu-Natal and the relevance of current data is provided. The problem statement was presented which informed the research questions, aims and objectives of the study.

Chapter 2: Literature Review

The second chapter will review international and local literature on health promotion, oral health promotion and Health Promoting Schools. This chapter traces the development of health promotion, school health education, oral health education and oral health promotion and shows the link between them. Oral health strategies are then presented. The Health Promoting Schools Initiative and its importance are then discussed. This is then followed by a discussion on health and oral health promotion at schools. A model for the integration of oral health into coordinated school health programmes is then presented. The discussion on the Health System in South Africa includes the impact that apartheid has had on the health system followed by the transformation of the health system in post apartheid South Africa. The infrastructure and challenges experienced are then presented followed by the development of primary health care and district health services in South Africa. Oral health service delivery in South Africa is then discussed followed by the results of the National Oral Health Survey. Lastly, a detailed situational analysis of KwaZulu-Natal is discussed. This includes the socio-demographic profile, burden of disease, health promoting schools, school health services and oral health services that are currently present. This chapter therefore provides an outline of all aspects related to the study.

Chapter 3: Conceptual Framework

This chapter discusses the relevance of using a mixed methods approach for evaluation of oral health promotion programmes and provides a rationale as to why this approach was used. The principles and differences between qualitative and quantitative methods are then discussed. The various tools that were used for the collection of qualitative and quantitative data are then presented. The development of the conceptual framework is then presented by first discussing the theoretical basis of this framework. This is followed by a detailed discussion of the three models that were used for the development of this framework. The conceptual framework is then presented followed by a discussion of the three phases of this framework. The three phases of the model provides the framework for data collection and data analyses.

Chapter 4: Methodology

This chapter firstly provides the study design of this research project. A motivation for the choice of mixed methods and triangulation for this study is then presented followed by a discussion on data collection. The table for the methodology is then presented followed by a discussion of the three phases of the methodological approach (Assessment, Implementation, and Review) of the study. The study population, selection procedures and tools used for data collection are presented separately and discussed in detail for each phase of this study. Ethical issues, which include ethical approval, gatekeeper permission, informed consent and confidentiality is then provided. The techniques employed for qualitative and quantitative data analysis are then discussed separately. Validation of qualitative and quantitative data is then discussed in detail.

Chapter 5: Overall Results and Discussion

In this chapter, comprehensive results from all three phases of the study are presented according to the objectives of the study. Data obtained from both the quantitative and qualitative methods are presented. Qualitative data obtained from all phases of the study was combined and coded into themes and then presented as categories. The categories included policy and priorities, situational analysis and opportunities and barriers. The challenges, strategies, barriers and benefits are embedded within these categories. The quantitative data was aligned to the various categories and reported accordingly. Direct narratives from the participants were also presented. The data was critiqued with evidence obtained from the literature. The strengths and limitations of the framework and integrated oral health promotion intervention are then presented.

Chapter 6: Manuscript Presentation

This chapter presents the manuscripts that were written for publication in this study.

The first manuscript, which has been published in the South African Journal of Child Health (2015), was developed from the situational analysis conducted in the first phase of the study to understand the contextualised delivery of oral health service provision within the Health Promoting School. This manuscript reports on the policy document review, situational analysis and priorities for health and oral health promotion. It addresses objectives 1 and part of object 2 of the study which is to identify current policies or priorities for health promotion and oral health promotion and to conduct a situational analysis of existing services provided at these schools.

The second manuscript, which has been published in the South African Dental Journal (2015) reports on the investigation of dental caries status and unmet oral health needs of six-year-old children at twenty-three Health Promoting Schools in KwaZulu-Natal that was obtained in the first phase of the study. It addresses a part of objective 2 of the study which is to conduct an epidemiological profile using the WHO DMFT Tool to determine unmet oral health needs of six year old learners at selected Health Promoting Schools in KwaZulu-Natal.

The third manuscript reports on the evaluation of the implemented tooth brushing programme at selected Health Promoting Schools in KwaZulu-Natal. It assesses the feasibility and sustainability of the tooth brushing programme that was implemented at the school. This manuscript reports on data obtained from the first and third phase of the study. It addresses objective 5 of the study which is to determine opportunities and barriers to the incorporation of a tooth brushing programme at Health Promoting Schools in KwaZulu-Natal.

Chapter 7: Conclusions and Recommendations

In this chapter conclusions and recommendations are presented in regard to the integration of oral health promotion into the Health Promoting School Initiative from the results and discussions presented in Chapter 5. The conclusions for each objective are discussed separately. Responses to the research questions are then discussed. The recommendations for the incorporation of oral health promotion into the Health Promoting Schools are then presented from the conclusions drawn from the results. Finally, the dissemination of the results is discussed.

In the next chapter a literature review is presented on health promotion, oral health education and promotion, oral health strategies, Health Promoting Schools, health and oral health promotion in schools, health system and oral health in South Africa and lastly, a situational analysis for KwaZulu-Natal.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Problems in oral health still exist globally in spite of many countries showing evidence of a positive change in the oral health of their populations (Petersen, 2004b). The global data basis on oral health at the World Health Organization provides evidence that demonstrates a high dental caries rate in up to 90% of school children and the majority of adults in developed countries. Further, dental caries rates appear less severe in developing countries such as Africa (Petersen et al., 2005, World Health Organization, 2002, World Health Organization). However, it is possible that the pattern in developing countries could change, especially amongst the disadvantaged and socially marginalised populations. This change could be due to a transformation in their daily lives comprising of a high sugar diet, an increase in the use of alcohol and tobacco and the scarcity in fluoride exposure (Petersen, 2004b).

Crucial human functions such as speaking, smiling, kissing, smelling, tasting, and swallowing in addition to a cry in response to pain is all controlled by the oral cavity (World Health Organization, 2003b). Poor oral health is amongst other factors known to cause severe pain and affect our eating patterns and speech. As a result this could hamper activities at school, work and home thereby affecting quality of life. Basic dental problems are also very expensive to treat and is therefore unaffordable to most of the population especially the disadvantaged (World Health Organization, 2003c). Budget allocations in low income countries would therefore not be able to accommodate the high demand and expensive treatment of dental caries. The high cost of treatment together with a high prevalence has therefore made oral diseases a major public health concern (Petersen, 2004b).

To address this concern it is imperative to look at preventive strategies aimed at reducing the burden of oral diseases. It is evident that preventable lifestyle related common risk factors exist between oral diseases and some of the major non-communicable diseases such as cardiovascular diseases, diabetes, cancer and chronic obstructive pulmonary diseases (Boutayeb and Boutayeb, 2005, Sheiham and Watt, 2000). Despite this strong association, a disconnection still exists between the examinations of the mouth with the rest of the body. The integration of oral health promotion into chronic disease prevention and general health promotion was therefore proposed by the World Health Organization for the prevention and management of oral diseases (Moyses, 2012, Petersen, 2004b).

This chapter covers significant topics related to the present study. The literature review firstly focuses on an overview of health promotion, school health education/oral health education and oral health promotion. This is followed by an outline of the various oral health strategies which are imperative to this study. The principles of the Health Promoting School and the incorporation of health and oral health promotion into these schools are then explored. The past and present health system and oral health in South Africa, which is pertinent to the current study, is then investigated. Lastly an outline of the situational analysis in KwaZulu-Natal which is where the study was conducted is presented. This literature review forms the foundation for the incorporation of oral health promotion into the Health Promoting School Initiative.

Prior to investigating oral health promotion and the Health Promoting School Initiative it was deemed necessary to look into health and the development of health promotion. The next section provides an overview of the development of health promotion.

2.2 Health Promotion

Health, a basic human right, is an important component of social and economic development (World Health Organization, 1997a). It has been established that good health is an essential element of daily life and that it has to be controlled by certain determinants which individuals must be able to identify in order to improve their quality of life. These determinants could be either within (individual health behaviours) or outside (social, environmental and economic conditions) their control (Nutbeam, 1998). With the purpose of expanding the perceptions of health and taking into consideration its complex determinants, health was therefore defined by the World Health Organization as "not merely the absence of disease, but a state of complete physical, mental and social well-being" (World Health Organization, 1986:1). The World Health Organization subsequently embarked on a plan to ensure that populations globally attained a level of health that would be socially and economically productive (World Health Organization, 1998g). The 30th World Health Assembly (World Health Organization, 1977) was therefore used as a platform for the launch of the policy on Health for All by the Year 2000 emphasising a need for a broader approach to health that would address changes in socio-economic factors.

This change in approach to global public health led to the first International Conference on Health Promotion in Ottawa. The Ottawa Charter (1986), the foundations of which are based on primary health care, health for all and intersectoral collaboration, was created and presented at this conference. This charter is considered to be a cornerstone for health promotion that guides action to promote health for all (World Health Organization, 1986). The key areas of health promotion as outlined in the charter include:

- promoting health through public policy,
- creating supportive environments,
- developing personal skills,
- strengthening community action, and
- reorienting health services (World Health Organization, 1986).

These five key areas are reliant on each other, however promoting health through public policy forms the basis for the remaining key areas (World Health Organization, 1986).

Subsequently there have been eight conferences on Health Promotion that have underlined the relevance and importance of key strategies in health promotion since the Ottawa Charter (1986) (World Health Organization, 2009). These strategies include equity in health through public policies, evaluation of the impact of these policies, sustainable environments and a comprehensive approach to health (World Health Organization, 1997a, World Health Organization, 1988a). However, the goal of Health for all by the year 2000 was threatened as rapid population growth posed a major threat to sustainable development (World Health Organization, 2009). The information obtained from these conferences has made critical input to the development of concepts, approaches and strategies in health promotion (Kumar and Preetha, 2012). These principles in health promotion have been subsequently included in the national health policies and programmes of many countries (World Health Organization, 2009).

Although the global health conferences had made a significant contribution towards the development of concepts, approaches and strategies in health promotion, many challenges were faced which included the risk of global pandemics, increase in non-communicable diseases and the lack of funds (World Health Organization, 2009, World Health Organization, 2005). Moreover, although improvements in health were noted in some countries, this was not evident in poverty-stricken developing countries. Unrestrained marketing also impacted on lifestyles and living and working environments (World Health Organization, 2014). This meant that all public policies had to consider the health implications of decisions that were made and ensure that there were no harmful health inputs into policies. Policy makers also needed to be held responsible for decisions taken (World Health Organization, 2014).

However, the vision of promoting health is not only the responsibility of experts in the field of health promotion but rather the responsibility of every individual in the community (World Health Organization, 2009). Interventions for the promotion and prevention of health should therefore be directed at reducing inequities in health and providing equivalent opportunities and resources to

individuals that would assist them in maintaining good health (World Health Organization, 2009). This would therefore entail providing a safe and sustainable environment and ensuring that individuals are provided with health information, taught life skills and given a choice to make healthy decisions early in their life (World Health Organization, 2009).

Despite these many challenges, health promotion has gathered a huge wealth of information, evidence and experience that has subsequently led to it being identified as an integrative and lucrative public health strategy and an integral part of the health system (Petersen and Kwan, 2010, World Health Organization, 2009). However, there is a lack of evidence on its implementation. Therefore, countries need to identify the responsibilities for the implementation of health promotion such as the empowerment of leadership, workforces, communities and individuals. Moreover, there needs to be improvement of knowledge and participation. (Petersen and Kwan, 2010, World Health Organization, 2009).

Additionally, to improve the quality and cost-effectiveness of interventions for health promotion, countries needed to consider evidence-based practice and the role of theory in this context. The value of a broad epistemological basis for research in health promotion and mixed methods using qualitative data was identified (Green, 2000). Randomised controlled trials, that were routinely used for the evaluation of health promotion were found to be inappropriate, unreliable and very expensive (World Health Organization, 1998c). Moreover, the measurement of effectiveness received priority in evidence-based practice, with not much attention being given to the role of theory. The limitations of empirical evidence of effectiveness were identified. It was found that they lacked theoretical principles that could advise wider application and improve the understandings of complicated situations (Green, 2000). Glanz and Rimer (2005) postulated that theory "helps practitioners to interpret the findings of their research and make the leap from facts on a page to understanding the dynamic interactions between behaviour and environmental context" (Glanz and Rimer, 2005:43).

2.2.1 Theoretical Basis for Health Promotion

Evidence in the literature suggests that programmes in health promotion are only successful when the determinants of ill-health are well understood, the needs of target populations are met and consideration is given to the context in which the intervention is being implemented (World Health Organization, 2012). This means that the intervention has to 'fit' the problem (Davies and Macdowall, 2006). Behavioural and social sciences form the theoretical basis of health promotion. Health promotion is a public health strategy that is based on the philosophy that opportunities have to be provided for individuals to allow them to increase control over and improve their health. This would

therefore require changes in social, environmental and economic conditions to ease the impact on individual health (World Health Organization, 2009, World Health Organization, 1986). This suggests therefore that health promotion is concerned with individual behaviour, the manner in which society is organised and the policies and organisational structures that underpin social organisation (Eriksson and Lindstrom, 2008, Davies and Macdowall, 2006).

The practice of health promotion is complex. Therefore, in order to develop effective programs, multilevel and comprehensive interventions would be required. It would be imperative therefore to consider factors that have an influence on health such as psychological, organisational, cultural, community-level, political and policy driven. Theories are therefore needed for the support of multilevel interventions so that reliable outcomes can be produced (Raingruber, 2013). Theories assist in explaining the necessity of an intervention, how to conduct the intervention and then evaluate for success (Glanz and Rimer, 2005). However, there is no theory available that can be used for health promotion in isolation because of the variety of health problems and their range of determinants that exist. Additionally, populations and settings are diverse, resources inequitably distributed and various skills required for action (Davies and Macdowall, 2006). Glanz and Rimer (2005) further argue that multiple theories would be required to tackle the different challenges that occur in health promotion (Glanz and Rimer, 2005:6).

The explanatory and change theory were found to be of relevance to the planning cycle of health promotion. The explanatory theory investigates the nature of the problem to identify modifiable risk factors while the change theory advises on the development and implementation of the strategies (National Cancer Institute, 1997). Without a sound theoretical basis the incorrect variables and not all the combined variables would be addressed. Furthermore, it would not be possible to ensure that all the required elements of the intervention are correctly placed. Green (2000) further argues that the utilisation of these theories can therefore improve the design of interventions thereby capitalising on probable effects (Green, 2000:126).

Besides the two theories mentioned above, there are many other theories that are of relevance to health promotion and it has been proposed that these theories should not be used in isolation. However, there are no guidelines on the selection of these theories (Mc Leroy et al., 1993). For quality studies it is also important to ensure that the evaluation methodologies used consider both process and outcome measures based on a sound theoretical framework (Green, 2000). The focus on outcomes and effectiveness is imperative to inform strategic planners and policy makers (Wimbush and Watson, 2000). For effectiveness, indicators would have to be developed. However, these indicators would have to be placed within a framework that would permit the link between the planned action and desired outcome over a period of time (Ralls and Thomson, 2000).

Frameworks proposed for health promotion are based on the idea that changes occur over a period of time and that time dimensions therefore need to be used for the differentiation of outcomes. They also suggest that various actions aimed at different levels are required for health promotion interventions. However, these frameworks do not consider the 'capacity-building' role of health promotion and its related outcomes (Tones, 1998, Nutbeam, 1998).

The above discussion outlines the theoretical approach and philosophy of health promotion. A similar approach can be used for improvement in oral health. If afforded the opportunity, individuals can increase control over and improve oral health with changes to social, environmental and economic conditions. Therefore, these merits including the use of various theoretical frameworks can be extrapolated for oral health promotion interventions.

2.2.2 Evaluation Frameworks in Health Promotion

Many countries including South Africa have adopted an evidence-based approach to health promotion (Department of Health, 2010a, Petersen and Kwan, 2010). Policy makers and programme planners would therefore have to make informed decisions when drawing up policies and planning programmes. This would therefore require high quality evaluations to inform decision makers on the most effective and efficient programmes to implement for target populations (Davies and Macdowall, 2006). The evaluation of outcomes and effectiveness meets the planning needs of strategic planners and policy makers (Wimbush and Watson, 2000). However, other assessment criteria such as the quality of programmes and programme design may be required by other stakeholders. This therefore led to the development of a framework for the evaluation of health promotion that included theory, quality and effectiveness for the development of programmes (Raingruber, 2013). The Health Education Board for Scotland (HEBS) developed a framework that could be used for the evaluation of health promotion programmes. This framework demonstrates that there are many stages and forms of evaluation that can contribute to the development of effective programmes (Wimbush and Watson, 2000). The value of evaluation products created in practice settings are demonstrated by this framework. These products inform quality actions that are relevant and acceptable to the local population. Additionally, attention is given to the various evaluation research methodologies that are required and relevant for practice settings. The framework also identifies areas of skills development that would be required. This therefore adds value to research and practice which is imperative for health promotion (Nutbeam, 1996). The use of a systematic approach to programme evaluation is recommended. The value of this approach is that it understands not only the outcomes and effectiveness of health promotion programmes, but also the reasons for the emergence of the outcome patterns. Therefore, in order to build a sound knowledge base for health promotion, this framework explains the division of evaluation labour and distinguishes between different forms of evaluation

required at the various stages of programme development. The success of this approach requires collaboration between policy makers, planning, practice and research (Wimbush and Watson, 2000). The comments above outline the importance of evaluation for evidence-based health promotion. This holds true for oral health as many countries, including South Africa, have adopted the evidence-based approach for oral health promotion. These inferences can therefore be used for oral health promotion.

There are many strategies that have been suggested for the promotion of health including oral health (Ogunbodede et al., 1999). An important strategy relevant to this study that is vital in the promotion of health and oral health is the 'settings approach' that looks beyond the individual (Whitelaw et al., 2001).

2.2.3 The 'settings approach'

With emphasis placed on supportive environments, the World Health Organization started to apply the principles of health promotion to settings (Whitelaw et al., 2001). The 'settings approach' saw a shift in focus from an individual, health problems and topic based risk factors approach to a systems and organisational approach (Whitelaw et al., 2001, Baric, 1993, Tannahill, 1990). Therefore, the focus was in the place where people worked or played. The advantage of this approach was that it placed importance on the environment rather than personal behaviour. Additionally, it changed from a disease-focused vertical approach to a needs driven and community participation approach. Moreover, the 'settings approach' offered pragmatic opportunities for the implementation of comprehensive strategies (World Health Organization, 1997a).

A key feature of this approach was to ensure that all activities and the ethos of the setting were supportive of each other. This approach allowed for the development of individual competencies and the possibility to restructure environments and build partnerships. Moreover, activities were sustainable because of active participation. Participants were also empowered to take ownership of change (Baric, 1991). Examples of settings included cities, communities, universities, hospitals, workplaces and schools. Evidence in literature suggests that this approach has been beneficial to health promotion by achieving successful outcomes (Baric, 1993).

Schools as a setting offer children and adolescents the opportunity to improve their health by shaping their behaviours and social values. For interventions to be effective, they need to be holistic and focus on the learners cognitive and social outcomes in the short and long term. Moreover, the capacities of stakeholders need to be built together with the provision of resources. Findings in literature suggest that quality school health programmes should be included in school policies and classroom teaching. The provision of school health services was also important. Consideration should also be given to the

environment and partnerships should be formed between the school, parents, health sector and local community (International Union for Health Promotion and Evaluation, 2000, Davis, 2000).

However, although there has been support for health promotion in a school setting, certain limitations prevail. While this approach is cost-effective it cannot be isolated from other public health actions for health and social problems. The effectiveness and sustainability of this programme is further dependent on whether stakeholders in this setting take ownership of the programme. Moreover, support from parents and health services are required for its success (International Union for Health Promotion and Evaluation, 2000).

One of the strategies of health promotion at schools is the inclusion of health education into the curriculum so that children can be reached at an early age to establish life-long behaviours and attitudes (Hurrelmann et al., 1995, Smith et al., 1992). The section that follows provides an overview of school health education and dental or oral health education.

2.3 School Health Education and Dental/Oral Health Education

Comprehensive health education has been viewed as a form of primary prevention and if obtained early in life, can assist with the prevention of major diseases later in life (Corry and Merki, 1978, Califano, 1977). School health education is therefore seen as a means to improving the health knowledge and status of learners, in addition to their behaviour, attitudes and skills in the making of decisions (World Health Organization, 2012, Heit, 1977, Southworth, 1968). Research studies have shown that school health education can assist in decreasing the prevalence of health-risk behaviours among learners thereby having a positive impact on their academic performance (Kann et al., 2007, National Center for Chronic Disease Prevention and Health Promotion, 2014). However, although school health education forms an important part of health promotion, there are limitations to it being used as a strategy on its own (World Health Organization, 2012). It was recommended that school health education should form part of a comprehensive school health programme (Birch, 1995). Therefore, to reduce the burden of oral diseases educative and preventive measures would have to be considered.

'Dental health education', a term commonly used in the 1970s and 1980s, endeavoured to improve the knowledge, attitudes and skills that were significant to the oral health of individuals. In 1993 Towner observed improvements in the delivery of dental health education which moved towards the modification of attitudes and behavioural changes as opposed to just the supply of information (Towner, 1993). Oral health education which replaced the term dental health education placed emphasis on the oral cavity as a whole (Stillman-Lowe, 2008).

Oral health education is considered an essential action for the promotion of oral health and the prevention of oral diseases (Petersen and Kwan, 2010, Laiho et al., 1987, Stephen, 1984, Burt, 1983). By imparting knowledge to individuals and providing them with skills, the actions of oral health education was able to make it possible for individuals to adopt behaviours that could improve and maintain their health thereby empowering them to make informed decisions about it (Fischer et al., 1986). Three approaches were identified for oral health education interventions namely chair-side, inoculation and persuasive. Chair-side oral health education, which involves a member of the dental health team advising the patient, occurs at a micro level as opposed to educational intervention aimed at a community (meso) level and population (macro level) (Sheiham and Croucher, 1994). Inoculation-based prevention which targets health risk behaviours that are already present is not frequently used in oral health education. However, the persuasive approach which targets established attitudes and behaviour using mass media and self-directed oral health education is commonly used for oral health education (Pfau, 1995). Self-directed learning (leaflet) encouraged a pledge to change a particular behaviour by planning and evaluating a change and then maintaining successful behaviour change (Watson and Tharp, 1993). While this approach increased knowledge and awareness there were limitations to promoting healthy behaviour. However, this mode of oral health education was an economical and practical way of targeting the masses to think about changes in health behaviour (Adair and Ashcroft, 2007).

Evidence from systematic reviews have shown that although oral health education has achieved effectiveness in improving knowledge in the short term and to a small extent tooth brushing behaviour and healthy eating, it has failed to address inequalities (Kay and Locker, 1997, Sprod et al., 1996, Kay and Locker, 1996). Factors such as cultural values, the level of education, age and the influence of parents and peers impacted on the effectiveness of these interventions and resulted in an increase in oral health inequalities (Schou and Wight, 1994, Rayner and Cohen, 1970). Flanders (Chapman et al., 2006) argues that although oral health education improves knowledge, long-term input and not just once-off interventions are required to achieve behavioural changes (Chapman et al., 2006:40). However, long term input for oral health education at schools could raise criticism as this would result in additional duties for educators (Hurrelmann et al., 1995).

In South Africa there is evidence of health education in the school curriculum but not oral health education (Department of Health and Basic Education, 2012). This study will investigate further the extent to which oral health education is included in the health education curriculum.

Limitations to oral health education, which was seen as an individualistic educational approach, were identified as a result of new developments that occurred in public health and general health promotion (Watt and Sheiham, 1999, Labonte, 1999, Schou and Wight, 1994). This subsequently led to the

emergence of the discipline of oral health promotion in the 1990s which was underpinned by the principles of the New Public Health movement (Ashton and Seymour, 1988). The next section provides an overview of oral health promotion.

2.4 Oral Health Promotion

Factors that have a positive influence on oral health include low sugar drinks, effective plaque control, sufficient fluoride exposure, no alcohol and tobacco and the correct use of dental facilities. These factors can be within the control of individuals, however social and political influences make this sometimes impossible (Watt, 2007). The literature suggests that, similar to health promotion, oral health promotion aspires to attain improvements in oral health that are sustainable and reduce oral health inequalities by focusing its actions on social, political and environmental determinants of health. (Watt, 2007, Watt et al., 2001, World Health Organization, 2000a, U S Department of Health and Human Services, 2000). However the timing of these actions and multidisciplinary collaboration would be imperative for its success (Watt, 2002).

Oral health professionals therefore needed to form collaborative partnerships with other disciplines to attain sustained improvements in oral health in the long-term (Petersen and Kwan, 2009). This would therefore entail focusing strategies for the improvement of oral health on common risk factors (Petersen and Kwan, 2009, Watt, 2002). Diet, tobacco and alcohol are risk factors for oral diseases (World Health Organization, 1980). However, common non-communicable diseases such as heart disease, cancer and strokes share similar threats (African Union, 2013). These risk factors, which are related to lifestyle, can be modified. It was therefore logical to use the common risk factor approach to improve health and oral health (World Health Organization, 1980, Sheiham and Watt, 2000). This integrated approach, that required the control of a few risk factors, had the potential to improve health at a lesser cost. The approach was also found to be more efficient and effective when compared to interventions that targeted just one disease (Grabauskas, 1987). The benefits of this approach would therefore be viewed more favourably by decision makers (Sheiham and Watt, 2000). To improve health, the Common Risk Factor Approach aimed to decrease risks and promote health by creating supportive environments, reducing the negative effects of risk factors and bringing about changes in behaviour (Watt, 2005). The advantage of this approach was that it improved the general health of the population including those at high risk. This invariably reduced social inequities (Sheiham and Watt, 2000).

Therefore there was a need to integrate oral health promotion into general health promotion programmes (Kwan et al., 2005, Petersen and Kwan, 2004). Although collaborative programmes have been in existence they have not been properly evaluated (Nowjack-Raymer, 1995). However, it has

been reported that a collaborative approach improved decision making within communities. New health care workers were also readily accepted with the presence of senior team members. A collaborative approach also ensured that a more comprehensive primary health care package was offered and that more people in the community were reached (Jansson et al., 1992, Boerma, 1987). A study conducted in Australia concluded that although there was good support for the incorporation of oral health into general health promotion, monitoring and evaluation of oral health outcomes was imperative (Kwan et al., 2005). Moreover, it was also important to evaluate the effect of advocacy and management in oral health and to investigate structural and workplace demands in general health care for the incorporation of oral health (Satur et al., 2010). Gill et al. (2009) argued that although there was a positive inclination for promoting health at schools there was still a challenge for the incorporation of oral health into health promotion activities in schools (Gill et al., 2009:191) In South Africa, although integrated oral health promotion interventions are mentioned in health policy documents there is no mention of the process that should be adopted for the implementation of these programmes (Singh et al., 2010, Singh, 2005). Moreover, current literature shows no evidence of integrated health and oral health programmes (Molete et al., 2013). South Africa currently faces many challenges for the integration of oral health at a district level (Singh, 2005). High workloads had led to low staff morale. This is compounded by no administrative support to co-ordinate the integration of oral health. Moreover, staff lack knowledge and skills in oral health. Additionally, a mismatch exists between the development of policies and the implementation of programmes (Singh, 2005).

In an attempt to create supportive environments and strengthen community action, oral health promotion policy employs various diverse but complementary strategies that include legislation, economic measures, taxation and organisational change (Petersen, 2003, World Health Organization, 2009). However, although healthy public policy, supportive environments and public participation are considered important for effective oral health promotion, they are not prioritised. Instead attention is given to improving the knowledge and skills of individuals and reorienting dental services (Watt and Fuller, 1999). Petersen (2008) further argues that gaps still exist in current health promotion interventions as public policies still fail to consider the impact of social determinants on oral health (Petersen, 2008:115).

As cited in Watt et al. (2006), Blinkhorn argued that to determine the impact and value of oral health promotion interventions it would be essential to have it evaluated so that invaluable feedback could be provided to participants and promoters of oral health to assist them in making informed policy decisions (Watt et al., 2006 :11). However, the evaluation of oral health promotion, which has been confronted with many challenges, is often overlooked (Downie et al., 1990). This is further supported by Cochrane Collaboration who reported that there is a paucity of information on the effectiveness of school-based interventions (Strøm et al., 2014, Cooper et al., 2011). Furthermore, programmes that

have been evaluated for effectiveness were of poor quality as a result of the utilisation of poor outcome measures that focused on clinical or behavioural fields. Moreover, these measures could also not be compared. Suggestions that emanated from these reviews was the improvement of evaluation standards in oral health promotion and the development of a more diverse range of quality outcome measures (Kay and Locker, 1998, Sprod et al., 1996).

A further challenge facing evaluations was the choice of methodology for the assessment of various clinical as well as preventive interventions. A lack of research knowledge, skills, resources, suitable evaluation frameworks and time constraints has however, hindered the progress of oral health promotion evaluation. Watt et al. (2001) argued that to assess the full impact and value of oral health promotion interventions, it would be vital to include both quantitative and qualitative methodologies as well as all players are involved with the planning of these interventions. In addition, ample resources and training would have to be provided to ensure quality in these evaluations (Watt et al., 2001:166).

Watt and Fuller (1999) proposed that future programmes should be based on concrete theoretical interventions, improved designs and evaluation. Furthermore, they should form stronger links with the community of general health promotion (Watt and Fuller, 1999:6). This could assist in achieving a committed social responsibility to health, improve investments in health development and partnerships and enhance focus on community empowerment (Brennan Ramirez et al., 2008, Ntuli, 2000, World Health Organization, 1997a). Oral health professionals would also need to work in collaborative partnerships with other relevant professionals and agencies in order to achieve sustained long term improvements in oral health (Sheiham and Watt, 2000).

For sustainability it was suggested that attention should therefore be given to establishing organisational systems for health by incorporating health into the daily social system as opposed to relying on health practitioner interventions (Atkinson, 2002, Perkins et al., 1999). The recognition of the intricate relationship between context and behaviour and the importance of influencing systems, structures and individuals to support change was imperative for initiatives in health promotion (Singh, 2012, Speller et al., 2005). The increase in research on the complicated association between social, environmental and institutional control on health behaviours and outcomes was now informed by systems dynamics, geographic information systems, agent-based modelling and social network analysis (Luke Douglas and Stamatakis, 2012). Systems dynamics modelling afforded stakeholders a bigger picture of the system they were entrenched in. This framework also provided an opportunity for the incorporation of known elements with the unknown (Metcalf et al., 2011, Hirsch et al., 2011, Homer and Hirsch, 2006). Oral health promotion should therefore consider social, cultural and environmental influences and examine their connection with a wide array of outcomes (World Health

Organization, 2004a). These outcomes would include mental and physical health, sickness and disorders, risk and protective behaviours, change in behaviour and approach to health and growth (Metcalf et al., 2011, Hirsch et al., 2011, Homer and Hirsch, 2006, Hancock, 1986). The focus of interventions in oral health promotion should thus be the behaviour of individuals on an intrapersonal and interpersonal level, organisational change at a community and institutional level and policies at a systems level (Burke et al., 2009). A framework for oral health promotion would therefore comprise of three levels namely, macroinfluences (health strategies for populations, economic systems, and policy formulation), mesoinfluences (community, work place, schools) and microinfluences (psychosocial skills to cope with disease, ability to change health behaviours by making healthier choices). Sustainability of this model would depend on social cohesion, partnership development and the sharing of resources (Metcalf et al., 2011). The utilisation of the intervention planning model provides a systematic approach to identifying the progress of the intervention from inception to dissemination (Riddle and Clark, 2011, Sales and Jeffrey Smith, 2006). It is also imperative to ensure that oral health promotion interventions conform to cultural and social values of the target population (Singh, 2012). A study conducted in Finland demonstrated success with the multilevel approach to oral health promotion where children improved their oral health-related behaviour when exposed to an oral health promotion intervention (Tolvanen et al., 2009).

The importance of evaluating interventions in oral health promotion to inform policy decisions cannot be overstated. This study utilised both qualitative and quantitative methodologies so that the full impact and value of interventions based on the needs of the learners could be assessed. For an effective and efficient oral health promotion intervention, strategies employed should be based on the needs of the community (Petersen and Kwan, 2004). The various strategies are discussed in the following section.

2.5 Oral Health Strategies

It has been established that oral health promotion is a strategy that is cost-effective and could therefore be utilised to reduce the burden of oral diseases and maintain good oral health and in turn improve quality of life (Petersen, 2008). Oral health has also been identified as one of the determinants of general health and should therefore be considered an essential component of general health promotion (Petersen, 2003). Therefore, in order to ensure the effectiveness and sustainability of oral health promotion strategies, it would seem sensible to link them to the broader strategies of health promotion (Petersen, 2008).

Subsequently, one of the major global strategies proposed by the World Health Organization at the World Health Assembly in 2007 for the prevention and control of non-communicable diseases was

the common risk factor approach (Watt, 2005, Sheiham and Watt, 2000). Peterson (2008) argued that some high income countries had made improvements to oral health promotion and oral disease prevention (Petersen, 2008:116). However, the same was not evident in low and middle-income countries. This was due to a lack of policies, funds and human resources for the implementation of sustainable and effective oral health promotion programmes (Petersen, 2008). To reinforce policies and strategies for the integration of oral health into national and community health programmes, the following recommendations were made:

- promotion of a healthy diet in particular a decrease in sugar intake and an increase in fresh fruit and vegetables,
- prevention of oral diseases related to tobacco use,
- access to clean drinking water, general hygiene and improved sanitation,
- establishment of national plans for fluoride use through drinking water, fluoride toothpaste, salt or milk,
- oral cancer screening for prevention of oral cavity cancer and oral pre-cancer,
- strengthening and management of HIV/AIDS through screening,
- building of capacity in the oral-health system with emphasis on disease prevention and primary health care especially for the disadvantaged,
- promotion of oral health in schools,
- promotion of oral health among the elderly,
- development of oral-health information systems to provide evidence to inform policy and practice, and
- promotion of oral health research (Petersen and Kwan, 2009, Petersen, 2008).

For national oral health programmes to be successful, adequate resources would need to be provided. Separate budgets would need to be allocated for funding integrated programmes, appropriate personnel would need to be trained and equipment and supplies provided. Moreover, these programmes would have to be coordinated, monitored and evaluated (Myburgh et al., 2004: 133-134)

The World Health Organization together with other international organisations that were involved with oral health offered their support to raise awareness on the determinants of oral and general health (Petersen, 2008). They also ensured that comprehensive and integrated oral health promotion targeted the low and middle income countries including disadvantaged populations (Petersen et al., 2010, Petersen, 2008). However, although oral health has improved in many countries over the past years there is still room for improvement (World Health Organization, 2003b). In South Africa, oral diseases has been identified in the National Oral Health Strategy as a silent epidemic especially

prevalent among children, elderly and the poor (National Department of Health and all Oral Health Stakeholders, 2010).

A strategy suggested at the 7th WHO Global Conference on Health Promotion for healthy public policy was the integration of health promotion into the educational system, teacher training and the curriculum of primary schools (Petersen and Kwan, 2010). These inferences were important for oral health promotion interventions. It is imperative for oral health promotion to adopt a more collaborative approach such as the common risk factor and be integrated into general health promotion. A similar strategy has been adopted in South Africa. However, although these strategies are included in the oral health strategy document, there is a paucity of information available on integrated programmes in South Africa, especially schools. This could be due to school oral health promotion programmes being fragmented, not evenly distributed and implemented and not being formally evaluated (Singh et al., 2010, Bhayat and Cleaton-Jones, 2003). Another important strategy advocated for oral health promotion was oral health interventions. The implementation of these interventions was suggested to address major oral health problems in South Africa (Department of Health, 2010a). These interventions included, fissure sealants, oral health education, fluoridation, tooth brushing programmes and nutrition. However, suggestions were made that these interventions should be based on evidence in the literature (Department of Health, 2010c).

2.5.1 Evidence in Oral Health Promotion Strategies

Prior to the implementation of interventions it is imperative to assess whether they are effective or not. A number of reviews have been conducted to assess preventive interventions that have been implemented to improve oral health. A major limitation that was identified with these programmes was that they did not manage to accomplish improvements in oral health that were sustainable. A possible reason for this was that risk factors were not taken into consideration in the programme (Watt, 2005). This therefore exemplifies the importance of implementing evidence based interventions.

The use of a steady low level of fluorides in the oral cavity has been found to be the most effective in the prevention of dental caries (World Health Organization, 1994). Fluoridated drinking water, salt, milk, mouth rinse, toothpaste and professionally applied fluorides are a means of getting fluoride into the oral cavity (ten Cate, 2013). An effective strategy for community fluoridation is through water which can reach an entire population. However, proper infrastructure is required for it to reach all homes. Furthermore, this strategy does not afford choice to the consumer as compared to salt fluoridation (Burt and Eklund, 2007). It was evident from systematic reviews that water fluoridation

has the greatest impact on the primary dentition and can reduce caries by 14% (Watt, 2005, Mc Donagh et al., 2000, Locker, 1999). However, the quality of these studies that were reviewed was low and conducted a long time ago and may therefore not be relevant to present lifestyles. Moreover, it must be noted that too much fluoride could result in dental fluorosis (Petersen, 2004b).

Tooth brushing with fluoridated toothpaste is a routine practice globally. Tooth brushing programmes with fluoride toothpaste has shown positive results (Hu et al., 1998, Lo et al., 1998). Cochrane reviews on the use of fluoride toothpaste also demonstrated a 24% reduction in caries rates (Arruda et al., 2012, Marinho et al., 2003b). Regular brushing with fluoridated toothpaste has also shown reductions in streptococcus mutans levels (Wan et al., 2003).

Fluoride mouth rinsing is a strategy that can be implemented in school-based oral health promotion programmes and at home. Studies conducted to assess the effectiveness of fluoride mouth-rinsing show that regular use could reduce caries increase by about 20% - 35% over a 2-3 year period (Birkeland and Torell, 1978). Fluoride mouth-rinsing is recommended in communities were the caries risk is high (Burt and Eklund, 2007).

Access to fluorides is not always practical or affordable to people, especially those living in developing countries and in particular rural areas (World Health Organization, 1994). Therefore, consideration should be given to supervised tooth brushing at schools especially those living in rural areas where toothpaste and tooth brushes may be unaffordable and therefore resulting in tooth brushing not being carried out at home (Burt and Eklund, 2007).

The use of fluorides has seen more of a decrease in proximal caries compared to pit and fissure caries (Stamm, 1984, Bohannan, 1983). Therefore a strategy that should be considered to address this problem is fissure sealants which are highly successful if placed correctly (Ripa, 1980). Sealant programmes at schools could reduce racial and economic inequalities, however they are expensive and should be targeted at those that are prone to caries (Leverette et al., 1983, Stamm et al., 1988). Singh (2011) suggested that fissure sealant programmes should be included in the basic minimum package for oral health service delivery in South Africa (Singh, 2011:261).

Another important strategy for health and oral health is nutrition. The types of foods we eat can also affect our oral and general health. Many chronic non-communicable diseases, that are currently a growing burden to developing and developed countries, are related to poor nutrition. Strategies therefore have to be implemented to reduce this burden. Interventions would include the inclusion of healthy eating into school policies, curricula, school lunch, school health and oral health services (World Health Organization, 2003a). The World Health Organization recommended less than 10%

energy intake of free sugars and drinks and foods with free sugars was only to be consumed four times per day. To control dental erosion, a limitation was also placed on acidic beverages. In addition consideration was also given to intersectoral collaboration for strategies on taxation and pricing, food labelling, school lunch policies and the support of nutrition programmes (Petersen, 2004a, Petersen, 2003).

An important tool that could produce changes in knowledge about proper nutrition resulting in a change in behaviour and lifestyle is oral health education which can be introduced into the school curriculum (Adair and Ashcroft, 2007) as discussed in Section 2.3.

The recommendation for the integration of health promotion into schools has subsequently led to the inclusion of oral health promotion into the Health Promoting School Initiative, the strategies of which are outlined in the following section.

2.6 Health Promoting Schools

"Health is inextricably linked to educational achievements, quality of life and economic productivity. By acquiring health-related knowledge, values, skills and practices, children can be empowered to pursue a healthy life and to work as agents of change for the health of their communities." Dr Hiroshi Nakajima – Director-General (World Health Organization, 1997c:1).

The above statement is supported by conclusions drawn from investigations conducted by The International Union for Health Promotion and Education (IUHPE) on links between education and health:

- Young people that are healthy are more likely to learn effectively.
- Health promotion can assist schools to accomplish their educational targets and meet their social aims.
- The attendance of school gives young people a better chance to good health.
- If young people feel good about school they are less likely to harm their health with high risk behaviours and are more likely to have better learning outcomes (International Union for Health Promotion and Education, 2009).

Determined political action, extensive contributions and sustained advocacy are some of the attributes required for a healthier world (Petersen, 2010). Globally, chronic and non-communicable diseases have been identified as one of the major causes of death and disability (Miranda et al., 2008, Strong et

al., 2005). Health-risk behaviours that could be established in the formative years of a child are responsible for about half the premature deaths that currently prevail. However, although these diseases cannot be cured, they are highly preventable. Lee (2009) argued that the social, economic, and cultural determinants of non-communicable diseases must be considered to ensure the prevention of diseases. Moreover, interventions needed to focus on individuals and families. Health promotion and disease prevention were therefore identified as an essential means of reducing the healthcare burden of children and adolescents (Lee, 2009:15).

From a public health point of view, schools that are attended by over a billion children worldwide can offer an ideal setting for the implementation of health promotion activities. The focus of these activities on learners, staff, families and the community enable them to make informed decisions about their health (Mohammadi et al., 2010, World Health Organization, 1996c). The acquisition of knowledge about disease conditions and the display of healthy behaviour, that is based upon a closed concept of health, was representative of the traditional topic-based approach to health education at most schools (Buijs, 2009). A more holistic approach to health promotion at schools was therefore required (Elfituri, 2011). Progress in school health has been largely influenced by the Ottawa Charter for Health Promotion (1986), which is in contrast to the traditional model of health education at schools (World Health Organization, 1986). The charter recommends a broad based health education curriculum that is supported by the environment and ethos of the school (St Leger, 2006, St. Leger, 1999, Rogers et al., 1998, World Health Organization, 1986). Table 2.1 below outlines the differences between the Traditional and Health Promoting School Approaches.

Table 2.1: Comparison between the Traditional Schools Approach to the Health Promoting Schools Approach

TRADITIONAL SCHOOLS	HEALTH PROMOTING SCHOOLS
1. Focus on school only.	1. Focus on school within the context of the surrounding community.
2. Focus is on classroom teaching.	2. Focus on entire facet of the school • curriculum, teaching and learning. • school establishment and surroundings. • school community.
3. Does not ascertain uniformity between what is taught in the classroom and the wider school surroundings.	3. Makes certain that the wider school surroundings echoes and supports what is taught in the classroom.
4. Attends to health matters individually.	4. Attends to the incorporation of precise health problems into a synchronized intervention of developing health literacy, life skills and self concept.
5. Attends to only the health requirements of learners.	5. Attends to the health needs of students, staff, parents and the broader community.
6. Strategise interventions in isolation of the regular school planning and development.	6. Attends to health problems through the standard structures and functioning of the school. Incorporates health promotion planning into the wider school planning and development.

Source: Adapted (Young and Williams, 1989)

The concept of the Health Promoting School was adopted to try and balance the health curriculum and traditional classroom teaching with a strategy that included structural, organisational, and economic or political change for improved health (Lynagh et al., 2002). This therefore afforded the opportunity for schools to improve school policies and environment and build links with the family and wider community to ensure improved health for all (Lynagh et al., 2002, Nutbeam et al., 1993b, Smith et al., 1992). Individuals were therefore able to acquire competencies thereby creating more control over their health and environment (Buijs, 2009, World Health Organization, 2003b, Department of Health: Health Promotion, 2000). The strategies of the Health Promoting Schools Initiative included:

- building capacity to advocate for improved school health programmes,
- creating networks and alliances for the development of Health Promoting Schools,
- strengthening national capacity, and
- carrying out research to improve school health programmes (Kwan et al., 2005, World Health Organization, 1998f).

These strategies provided a basis which enabled countries to develop policies and collaboration between the departments of health and education to improve health using the school as a setting (Kwan et al., 2005).

Evidence from literature searches suggests that benefits from this initiative could only be achieved if schools had a comprehensive school health framework in place that included skills development, physical and social environments, integrated health services, awareness to equity issues, community partnerships and parent involvement (St Leger, 2006, St. Leger, 1999). A review conducted by the World Health Organization in both developing and developed countries established that health promotion at schools could reduce general health problems and improve the efficiency of the education system. It could further enhance public health, education, social and economic development (Fisher et al., 2003, St. Leger, 1999). However, many barriers were identified with the development of school health programmes. These programmes lacked vision and strategic planning. There was also a lack of collaboration and coordination amongst stakeholders. Further, a lack of understanding and acceptance of school health programmes prevailed amongst participants. A lack of ownership and resources further impacted on the programme (World Health Organization, 2000b). Further, research studies addressing specific health concerns have found that the Health Promoting School framework has a lot of potential for school health programmes however, evidence was lacking in the benefits of school-based policies focusing on health (St. Leger, 1999). Although the Health Promoting Schools Initiative has benefits for health promotion, several limitations inhibit the expansion of this initiative.

2.6.1 Limitations to the Health Promoting Schools Initiative

Evidence in literature demonstrates limitations to the adoption and implementation of the Health Promoting Schools Initiative. Resnicow et al. (Lynagh et al., 1999) argue that a lack of support from the Department of Education impacted on the adoption and implementation of the Health Promoting Schools Initiative. Additionally, teachers were not adequately trained in health promotion and lacked commitment. Time constraints and a lack of administrative support were some of the problems experienced by the teachers (Lynagh et al., 1999:228). Coonan et al. (Lynagh et al., 1999) further argue that lack of parental involvement, high workloads, timetabling and resource issues were also experienced (Lynagh et al., 1999:228). Multi-disciplinary and intercultural evaluation and research was also lacking for the Health Promoting Schools Initiative (Hung et al., 2014, Symons et al., 1997).

2.6.2 Health Promoting Schools Initiative in South Africa

The benefits of the Heath Promoting School have been recognised, accepted and implemented by many countries world-wide including South Africa (Department of Health: Health Promotion, 2000,

St. Leger, 1999). At the time almost half the population of South Africa were children under the age of 19 and schooling was made compulsory by the introduction of the South African School Act of 1996 (Vergnani et al., 1998, Central Statistical Services, 1996). The school therefore provided an ideal setting to improve the health status of learners, their families and communities as this was one of the many challenges facing South Africa (World Health Organization, 2000b, Vergnani et al., 1998). Subsequently, to encourage greater intersectoral cooperation and strengthen the capacity of the Health Promoting School Initiative, a Health Promoting School's Network was proposed to coordinate, promote and maintain this concept at a national, provincial and local level (Swart and Reddy, 1999). The launch of the National Programme of Action for children in 1996 provided evidence of South Africa's commitment to intersectoral collaboration (Vergnani et al., 1998). The purpose of this programme was to promote the well-being of children in South Africa by integrating all policies and plans developed by the government departments and Non Government Organisations (Vergnani et al., 1998, Biersteker, 1997). There are currently over 1000 Health Promoting Schools established in South Africa (Shasha et al., 2011, Johnson and Lazarus, 2003).

Although South Africa has accepted and commenced with the implementation of the concept of the Health Promoting School (Swart and Reddy, 1999), there are still various barriers that impair the effective functioning of this concept (Swart and Reddy, 1999). School health services, which is crucial to the success of Health Promoting Schools, are still fragmented and inadequate lacking both staff and resources (Vergnani et al., 1998, Adnams and Lachman, 1994). School health teams also experience difficulties gaining access to schools. A lack of funds is another barrier that impacts on the success of the Health Promoting School. Moreover, teachers and school health nurses are poorly trained, especially in oral health. Teachers are also overloaded with the syllabi and overcrowded classes. A lack of co-operation and co-ordination of services between the Department of Health and Department of Education, further impact on the effective functioning of the Health Promoting School. There has been some progress however with the development of policies and intersectoral collaboration for the establishment of Health Promoting Schools (Mohlabi et al., 2010, Swart and Reddy, 1999, Vergnani et al., 1998). Similar limitations were also experienced in other countries as outlined in Section 2.6.1.

The aforementioned inferences are important for the Health Promoting School Initiative in South Africa. There are various factors that impact on the effective functioning of the Health Promoting School and therefore evaluations have to be conducted in KwaZulu-Natal to assess the effectiveness of this initiative and to identify barriers to its successful implementation as conducted in this study (Onya and Kekana, 2006). The incorporation of oral health promotion into the school setting benefits the school and community through effective collaboration (Petersen and Kwan, 2010, Kwan et al.,

2005). The next section highlights the benefits and limitations that are encountered with the incorporation of oral health promotion into the Health Promoting Schools Initiative.

2.7 Health and Oral Health Promotion in Schools

Extensive reviews have shown that previous traditional health education programmes has had minimal and short-term effects (Nutbeam, 2000). Moreover, school-based health and oral health education programmes have been relatively ineffective (Kay and Locker, 1998, Nutbeam, 1997, Lynagh et al., 1997, Brown, 1994, Schou and Locker, 1994). In contrast, effective health and oral health promotion requires adjustments to the physical and social environments in which people live, work, study and play as opposed to just giving instructions to people (Petersen and Kwan, 2010, Watt and Fuller, 1999). It has already been established that schools are the most creative and cost effective way of improving oral health and in turn quality of life (Petersen, 2004b, Petersen, 2003). However, converting schools into Health Promoting Schools is dependent on the foresight and commitment of management and staff at a local level and the availability of resources for its success (Petersen, 2003). Moreover, if health promotion and oral health promotion is to be successfully implemented at schools, there needs to be improvement in the professional development of teachers. Furthermore, more evaluations need to be done on the implemented programmes so that informed decisions can be taken for the sustainability of these programmes (St Leger, 2004).

Strong arguments for the promotion of oral health through Health Promoting Schools were presented in a document that was compiled by the World Health Organization Oral Health Programme (World Health Organization, 2003b, Kwan et al., 2005). These factors included:

- pupils and students being accessed during their formative years which is an important stage when lifelong oral health related behaviours as well as beliefs and attitudes are being developed,
- supportive environment being provided by schools for oral health promotion,
- the significant burden of oral disease in children,
- control of risk behaviours by school policies, physical environment and education for health is essential for the attainment of oral health, and
- the school providing a platform for the provision of oral health care through preventive and curative services (World Health Organization, 2003b).

This document was intended to assist individuals in health promotion strategies to improve oral health. This could subsequently result in the enhancement of the overall health and well being of

children, families and communities (World Health Organization, 2003b).

With structures and systems already in place, the school provides an ideal setting for oral health promotion (Kwan et al., 2005). This in turn can facilitate the provision of essential services such as safe water and sanitation (World Health Organization, 1996a). Healthy school environment, school health education and services, nutrition and food services, physical exercise and leisure activities, mental health and well-being, health promotion for staff and community relationships and collaboration have been identified as key factors of a Health Promoting School (Kwan et al., 2005). Figure 2.1 demonstrates the integration of oral health promotion into coordinated school health programmes.

Figure 2.1: Coordinated School Health Programme Model
Source: Centre for Disease Control and Prevention

Kwan et al. (2005) argues that for the implementation of oral health promotion programmes at schools, the key factors illustrated in Figure 2.1 would need to be interrogated to identify opportunities that would be able to deal with oral health issues, either on its own or part of a general health promotion approach. He further argues that health promotion programmes should be supported by single school health policies that address several risk factors (Kwan et al., 2005:679).

The benefits that are obtained from the creation of the Health Promoting School Initiative are important. This concept provides an opportunity to develop health promotion and oral health promotion policies, practices and structures at schools into planned activities for the school and community. The Health Promoting School Initiative also provides a chance for everyone to express ideas or opinions and agree to collaborate towards a common goal (World Health Organization, 2000c).

Healthy school environment such as safe playgrounds and buildings, smoke-free environments and the accessibility to healthy foods are initiatives that can assist in the promotion of oral health by reducing the risk factors to oral and general health (World Health Organization, 2003c). This would subsequently promote a healthier lifestyle (Kwan et al., 2005). However, a lack of resources and proper infrastructure were one of the barriers that were identified by the World Health Organization Expert Committee that impacted on this process (World Health Organization, 2000b).

Health which forms part of the curriculum of many schools in the world today enlightens learners on healthy diet, hygiene and safety (St Leger and Young, 2009). Oral health could also be incorporated into the curriculum (World Health Organization, 2003b). However Symons and her colleagues 1997 study (St Leger, 2000) argued that there were poorly trained teachers and little time available at school to deal with health issues (St Leger, 2000:82). St Leger and Young (2009) further argued that although this subject is on the timetable it is invariably allocated a small amount of time in the school curriculum (St Leger and Young, 2009:69).

The provision of school health services which is integral to the promotion of health and oral health varies between the industrialised and developing countries (Kwan et al., 2005). Evidence shows that facilities in some industrialised countries are far superior to what is available in developing countries where many schools have inadequate infrastructure and resources available to provide efficient health and oral health services (Kwan et al., 2005). Similar problems are experienced in KwaZulu-Natal with school health services not being efficient due to staff shortages. This therefore results in infrequent visits to schools (Department of Health and Basic Education, 2012).

Although the Health Promoting School Initiative has its benefits, there are also limitations that have been identified for the implementation and dissemination of this programme (World Health Organization, 2006b). These limitations vary amongst the different countries depending on the availability of resources and commitment. Conclusions drawn from a study conducted by Kwan et al (2005) indicate that commitment from national and provincial government, schools, families and the community were critical for the sustainability of these programmes (Kwan et al., 2005:684). The government and health professionals also needed to support this initiative by providing funds and learning materials to ensure that all schools become Health Promoting Schools (Kwan et al., 2005). Atkinson and Collins (2010) further argued that time constraints at school was a major challenge facing the implementation of this programme as the primary focus at school was education (Atkinson and Collins, 2010:76). St Leger (2000) also noted that a lack of administrative support, collaboration and vision as well as poorly trained teachers impacted heavily on this initiative (St Leger, 2000).

From the above factors it is noted that there are many barriers that prevent the successful incorporation of health and oral health promotion into the Health Promoting School Initiative. It is therefore important for these barriers to be identified and addressed prior to the implementation of the programme to ensure its success. Prior to investigating the feasibility of incorporating oral health promotion into the Health Promoting School Initiative, it was imperative to investigate the structure and processes of the health system and to identify where health and oral health promotion was placed. Since 1994 the healthy system in South Africa has faced huge challenges, several of which are still present today. The proper management of the health system in a country is crucial to achieving health for their population (Coovadia et al., 2009). The next section provides an overview of the past and present health system in South Africa.

2.8 The Health System in South Africa

The Republic of South Africa, positioned at the southern most point of Africa is divided into nine provinces and fifty two districts. The 2013 Stats South Africa mid-year population estimate was 52.98 million. Although in transition, South Africa still experiences a significant burden of communicable and chronic diseases. However, there has been improvements in the provision of basic services that are aligned to the social determinants of health (Department of Health, 2014a).

2.8.1 Historical Imbalances

The health system in South Africa has undergone many changes from the colonial period to the current post-apartheid period. Prior to 1994 there was fragmentation within the public health system and between the public and private sectors. Health centres were racially segregated with curative and

preventive services run as separate entities. Health services were mainly hospital based and there was no priority given to primary health care (Coovadia et al., 2009). Moreover, health education and promotion was racist and didactic (Onya, 2007). At the culmination of the apartheid era, there were 14 separate health departments as a result of the creation of the bantustans (Coovadia et al., 2009). Subsequent to the change in government in 1994, newly formulated policy documents were developed to address poverty and inequality. These policies also restored the dignity, safety and security of all South African citizens (Onya, 2007). These policy documents informed the transformation of the health care system into a two-tiered system comprising of a public and private sector with the overall responsibility given to the Department of Health (Coovadia et al., 2009).

2.8.2 Defining Health Promotion and Primary Health Care

Health promotion and primary health care have been identified as important functions within health services. The selection of these approaches ultimately impacts on service delivery. In South Africa, a combination of these two approaches is being used.

Good health is essential for everyday life. Therefore individuals and populations need to be empowered to identify factors in their life and environment that affect their health. Health promotion is a comprehensive and social process that not only allows individuals to increase control over and improve their health, but strives to change social, environmental and economic conditions in order to ease their impact on public and individual health (World Health Organization, 1998d, World Health Organization, 2012). Advocacy, enabling and mediating strategies are employed by health promotion (World Health Organization, 1986). Advocacy for health ensures that the political, economic, social, cultural, environmental, behavioural and biological conditions support health (Kumar and Preetha, 2012, World Health Organization, 1986). Opportunities have to also be made available to enable individuals to reach their full health potential. This would entail reducing differences in current health status and providing equal opportunities and resources (Elfituri, 2011, World Health Organization, 1986). Therefore supportive environments, access to information, life skills and opportunities have to be provided for individuals to make informed decisions on their health (Elfituri, 2011, World Health Organization, 1986). However, the responsibility for these prerequisites is not for health services alone. In health promotion, a more coordinated approach is required involving mediation with all stakeholders. This includes government, social and economic sectors, nongovernmental organisations, industry, media and others. These strategies must also be adapted to the local needs of individual countries and be informed by social, cultural and economic systems (Elfituri, 2011, World Health Organization, 1986).

The primary health care approach has evolved from the social model of health (White, 2015). The belief of this public health strategy is that priority needs to be given to people's basic needs to attain improvements in health. (Keleher, 2001). At an operational level, the guiding principles of primary health care are selected based on the specific situation or system. This would therefore require that consideration be given to the underlying social determinants of ill-health such as unemployment, poverty, access to basic amenities, etc. for the strategies employed in primary health care (The National Advisory Committee on Health and Disability, 1998). Although primary health care is in response to the local needs of each individual, their families and the greater population, it is guided by a comprehensive, intersectoral approach focusing on communities as the unit of intervention (Singh, 2012). The achievement of equity in health service delivery, access to services that is affordable and appropriate, empowering individuals and the sustainability of services are all guiding principles of the primary health care approach (Singh, 2012, Van Weel and De Maeseneer, 2010, Keleher, 2001).

2.8.3 Infrastructure

Presently the Department of Health is represented in national government under the Directorate of Health Promotion in the Social Sector Cluster. Since 1994, the primary health care approach has become a crucial component of the South African health system (African National Congress, 1994). This approach sought to eradicate the fragmentation and duplication of services. This was achieved by integrating all health services under a single department; decentralising the organisation and management of health services with the introduction of the district health system; and ensuring that comprehensive, community-based health care was accessible to the whole population by establishing primary health care centres (African National Congress, 1994). The previously fragmented health system was therefore integrated to ensure the successful implementation of primary health care. This resulted in the establishment of 9 provincial Departments of Health compared to the previous 14. The racial and gender inequalities that prevailed in the managerial structures during the apartheid era was also eradicated. In addition, to ensure accessibility to health services, the Department of Health prioritised investments in infrastructure and the building of new clinics (Barron and Roma-Reardon, 2008).

Health promotion, an important intervention strategy, was recognised by the African National Congress for its vision in primary health care and as a means to improving the health of South African citizens as all citizens had a right to access to health care services, adequate food and water, social security and social assistance (Onya, 2007, Hassim and Heywood, 2007). Caution must be placed on the understanding of health promotion and primary health care. Although the concepts of health promotion and primary health care are similar, they are nonetheless not the same. Health promotion focuses on the promotion of health encouraging healthy lifestyles for individuals and their

environment. Primary health care, on the other hand, is defined as health care that is a social and political effort to ensure that health knowledge, health care skills and health service delivery systems are in response to the needs and situation of the communities (Kautzky and Tollman, 2008, Coulson, 2000).

Health promotion initiatives in South Africa were underpinned by the White Paper (1997) and the Reconstruction and Development Programme. Effective strategies included formulation of public policies and legislation, community participation, improving skills of citizens, encouraging a healthy and social environment, empowering communities and individuals to improve their health and the reorientation of health services and delivery (World Health Organization, 2009, National Department of Health, 1997). However, a major barrier identified in the development of health promotion was government infrastructure which placed health promotion as a Directorate within a cluster thereby preventing it from having an influence on policy development and programme implementation (Onya, 2007).

To ensure an equitable, efficient and effective health system, the District Health System based on the principles of the primary health care approach was adopted (Mc Coy and Engelbrecht, 1999, World Health Organization, 1988b). Efficient and effective health service delivery and equitable distribution of health services, which were the guiding principles of primary health care, were fundamental to the improvement of community health (Phaswana-Mafuya et al., 2008). The district health system therefore adopted a bottoms-up approach to planning, policy development and management focusing on community involvement, integrated and comprehensive health care delivery and intersectoral collaboration (Mc Coy and Engelbrecht, 1999). This approach enabled local hospital managers to take control of operational issues such as budgets and human resources that would enable a timeous response to local needs (Mc Coy and Engelbrecht, 1999). Accomplishments in the primary health care approach included free primary health care and an improved health systems management (Harrison, 2009).

2.8.4 Challenges

The restructuring process has attained some improvements in accessibility, rationalisation in the management of health and a more equitable distribution of funding. However, these achievements were short lived as a result of a large increase in the burden of disease associated with HIV/AIDS, a weakened management system in health and low staff morale (Harrison, 2009). Other factors that negatively impacted on the implementation of primary health care were resource constraints, an imbalance in personnel distribution between the private and public sector, migration of health professionals and skills shortages (Department of Health, 2010c, Rispel et al., 2010, Schneider and

Barron, 2008, Heunis et al., 2006). Barron (2008) added that there were inconsistencies in the implementation of the district health system with some districts having great success while others had systems in place that were fragmented and poorly coordinated (Barron, 2000:3). Dookie and Singh (2012) suggested that this was probably due to health care delivery not being equal at provincial and district level as a result of inequalities in health services and inequities in resource allocation (Dookie and Singh, 2012:2).

The availability of pertinent and adequately trained personnel also affected health services and primary health care. Insufficient foresight in planning has resulted in a lack of clinical and community service posts, poor allocation of human resources and high attrition rates. To address this problem it was suggested that the training curricula of health care workers adopt a more integrated and holistic approach in line with primary health care (Naledi et al., 2011).

A further setback noted in a report by the Department of Health (2012) indicated that the current South African health system was not balanced with the public sector making up a large proportion offering free basic primary health care as opposed to highly specialised technology that was being offered at both the private and only some public health services (Department of Health, 2012). The report further noted that consumers of the private sector belonged to medical schemes and were from the middle and high income group. However, although the private sector made up a small proportion of the health system, it was rapidly growing. The report further indicated that the state contributed only 40% to health expenditure although it had 80% of the population dependent on its public health services. This has therefore put the public health system under strain resulting in limited resources in certain areas and hence the need to prioritise spending in these areas (Department of Health, 2012).

In response to the many challenges that are still being encountered by the Department of Health a new policy in the form of the National Health Insurance (2011) was developed (Department of Health, 2011a). The purpose of this policy was to provide a comprehensive coverage for health care, which was inclusive of population and service coverage and financial risk protection, for all citizens of South Africa (World Health Organization, 2008). Objectives of this policy included improved access to quality health services for all citizens, the creation of a single fund, controlling of financial resources and improved health systems performance (Department of Health, 2011a). Recommendations for the re-structuring of primary health care into three streams in order to improve health services and reduce previous inequities were suggested as follows:

- A district-based service model that would prioritise health care programs at a local level.
- A school-based primary health care programme dealing with eye care, oral health care, hearing problems and immunization that would address the basic health needs of learners and

would include health promotion and prevention and curative care. School health services would be delivered to Pre-Grade R to Grade 12.

- A municipal ward-based model comprising of at least 10 trained primary health care workers per ward (Department of Health, 2011a).

However Dookie and Singh (2012) argue that the success of this approach would require tough management and improvement of the current district health system (Dookie and Singh, 2012:4). Greater emphasis would therefore have to be placed on health promotion and prevention, recognition of traditional medicine, greater intersectoral collaboration and community commitment and empowerment (Dookie and Singh, 2012).

An important component of quality primary health care is oral health which is a fundamental human right that is necessary for good general health and quality of life (Petersen, 2010, World Health Organization, 2003c). The next section outlines oral health in South Africa.

2.9 Oral Health in South Africa

The responsibility for the management of oral health in South Africa is the Department of Health. Oral health is under the directorship of Health Promotion, Nutrition and Oral Health within the structures of the Department of Health. Services for oral health in South Africa is provided by dental specialists, dentists, dental therapists, oral hygienists, dental technicians and dental assistants registered with their respective professional bodies at the Health Professionals Council in South Africa. Currently there are 1218 oral hygienists and 708 dental therapists registered with the council. These oral health personnel provide services in both the public and private sector. The distribution of oral health personnel between these sectors however, is not balanced with less than 20% of oral health practitioners working in the public sector (Department of Health, 2003b). This indicates gross inequities in the public sector which has 80% of the population dependent on its public health services (Department of Health, 2012).

The basic primary oral health care package for South Africa comprises of promotive and primary preventive oral health services which includes oral health education, tooth brushing programmes, fluoride mouth rinsing, fissure sealant application and topical fluorides (Department of Health, 2000). Basic treatment services in the package includes examination, bitewing radiographs, scaling and polishing, simple (1-3 surface) fillings and emergency relief of pain and sepsis (Department of Health, 2000). These services are provided through dental clinics based at provincial hospitals and clinics and community health centres. However, the timeous implementation of these programmes is compromised as a result of only less than 20% of oral health personnel working in the public sector.

The impact of these inequities is evident in studies conducted in South Africa to establish oral health status, trends and treatment needs of the population (van Wyk and van Wyk, 2004).

2.9.1 Results from National Studies

Despite many studies being performed on the South African population to establish oral health status, there have been only three on a national scale (Du Plessis et al., 1994, Singh, 2011). The first study by Williams in 1984 established the dental health status of twelve-year-olds in the whole country (Williams, 1984). The last two studies were conducted by the national Department of Health (Department of Health, 2003a, Department of Health, 1994). The National Oral Health Survey in 1988/89 focused on adults and children in the five major cities in South Africa (Department of Health, 1994). A subsequent study was conducted ten years later in July 1999 to June 2002 which focused on the 4 to 5, 6, 12 and 15-year old age group (Department of Health, 2003a). Results from these studies have established that oral diseases, especially dental caries, are prevalent in South Africa particularly among children, the aged and the underprivileged (National Department of Health and all Oral Health Stakeholders, 2010). However, since 2003 no studies have been performed nationally. This therefore highlights the fact that there is a paucity of new information, especially for adults, that is available to inform policy and interventions for the present situation that prevails. This therefore suggests that current oral health planning and programmes that are implemented does not address the current dental caries prevalence rates in adults and children (Singh, 2011).

2.9.1.1 Dental Caries

The last National Oral Health Survey (2003) reported that 39.7% of the 6-year-old population were caries free (Department of Health, 2003b). This is however much lower than the World Health Organization goal of 50% set by the National Department of Health for the year 2000 in South Africa (Leopold et al., 1991). Results from the National Oral Health Survey (2003) further indicated that the presence of caries in the primary dentition was higher than in the permanent dentition and that more than 80% of all caries in children went untreated (Department of Health, 2003a). The dental caries status of children was evaluated by using the decayed, missing and filled teeth (dmft) index. The decayed component which recorded untreated caries was the highest in the 6-year-old age group (Department of Health, 2003a). van Wyk and van Wyk (2004) pointed out that this could be as a result of the inequitable distribution of dental service provision in addition to the lack of knowledge of the population on the type of dental services provided (van Wyk and van Wyk, 2004). The missing component for the 6-year-old age group was also high confirming that dental extractions was the main form of treatment offered to the population. The study also showed that the values for the filled component was very low indicating that this could be due to a lack of oral health personnel and the

availability of equipment and consumables (Department of Education - KwaZulu-Natal, 2010b, Harikiran et al., 2008).

2.9.1.2 Periodontal Disease

The presence of periodontal disease was a common finding in all age groups in the national oral health surveys (van Wyk and van Wyk, 2004, Department of Health, 1994). Findings in the last survey indicate that not more than 15% of 15 year old children that presented for examination had healthy periodontal tissues (Department of Health, 2003a). The main etiological factor found was calculus as a result of poor oral hygiene. This could be as a result of social inequality as argued by Gugushe (1998). Findings in his study revealed that poor oral health was linked to low social class. Moreover, populations from a lower socioeconomic background had limited access to dental services and treatments (Gugushe, 1998).

2.9.1.3 Dental Fluorosis

The benefits of optimal levels of fluoride has been recognised for the reduction of caries (Burt and Eklund, 1999). The presence of fluorosis varied across the provinces in South Africa. In the last survey conducted, about 35% of the 12-year-old age group presented with questionable or very mild fluorosis. The more severe cases of fluorosis were found in the Northern Cape with more than 20% of children in the moderate and severe classes (Rayner, 2006). This could be due to naturally occurring fluorides in the water together with mining and industrial activities (Rayner, 2006, van Wyk and van Wyk, 2004).

2.9.1.4 Malocclusion

The examinations for malocclusion were limited to the 12-year-old age group. Findings in this survey established that the prevalence of malocclusion varied across provinces with the highest incidence recorded in the Eastern Cape. Crowding, which was found in 35.77% of the children, was the most commonly occurring malocclusion. However, 67.68% of the children did not require any form of treatment for malocclusion (van Wyk and van Wyk, 2004).

2.9.1.5 Oral manifestations of HIV/AIDS

HIV/AIDS, the rapidly increasing epidemic in the world today, threatens progress made by countries (World Health Organization, 2003c). South Africa has 6.2 million people living with HIV, the largest number compared to other countries in the world (Department of Health, 2014b). Oral manifestations of HIV infection include pseudo-membranous oral candidiasis, oral hairy leukoplakia, HIV gingivitis

and periodontitis, Kaposi sarcoma, non-Hodgkin lymphoma and dry mouth as a result of a decrease in the flow of saliva (Prabhu et al., 2013). These manifestations are seen in about 40-50% of people infected with the disease in the early stages (World Health Organization, 2003c). Although the burden of disease for HIV/AIDS is high in South Africa, this disease was not included in oral health surveys that have been conducted in the country leading to gaps in information to inform planning for oral health services.

Following these national surveys a new National Oral Health Strategy was drafted in 2010 by the National Department of Health and all Oral Health Stakeholders. It is informed by the proposal endorsed by the World Health Organization that gives priority to evidence based interventions. This document presents a framework for strategies that need to be prioritised and for the identification of target groups and indicators for the implementation of interventions at a provincial and district level (National Department of Health and all Oral Health Stakeholders, 2010). Some of the objectives of this document were for the prevention of oral diseases and the promotion of oral health. Additionally, the reduction of the burden of untreated oral diseases, the adoption of the common risk factor approach and the integration of oral health across all disciplines and sectors was prioritised (World Health Organization, 2003c). National Goals for 2020 were also set. It was advocated that 60% of six-year-olds were to be caries free and have fissure sealants placed on first molars by the year 2020 (National Department of Health and all Oral Health Stakeholders, 2010). Moreover, the Department of Health together with the Department of Basic Education and South African Dental Association has formed an alliance with Colgate World of Care reaching 500 000 Grade 1 – 3 learners every year. Colgate World of Care also provides teachers and health care professionals with classroom learning kits to assist them with the promotion of oral health (Colgate World of Care).

This study was conducted in KwaZulu-Natal so it was imperative to study the literature on oral health in this province. This will be discussed in the next section which is the situational analysis of KwaZulu-Natal.

2.10 Situational Analysis of KwaZulu-Natal

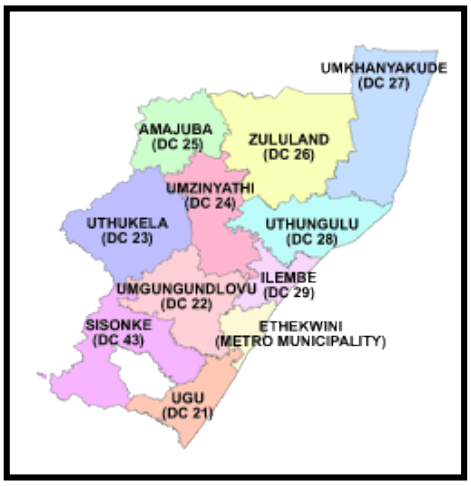

Figure 2.2: District Map of the Province of KwaZulu-Natal

The province of KwaZulu-Natal is spread over 8% of the geographic area of South Africa and is divided into eleven districts as illustrated in Figure 2.2. The province, which is to a large extent made up of remote rural settlements, faces many challenges in the delivery of infrastructure (Department of Health - Province of KwaZulu-Natal, 2013). The situational analysis and socio-demographic profile in KwaZulu-Natal is captured in Table 2.2.

Table 2.2: Situational Analysis/Socio-Demographic Profile of KwaZulu-Natal

Total population	10, 586 757 (2009)
Gross enrolment ratio – Grade 1 -12	95%
Percentage of people living in rural areas	54%
Percentage of people below the age of 35 years	70%
Number of pupils attending public (ordinary) schools	2, 569 793
Number of primary schools	3826
Number of secondary schools	1338

Sources: Department of Education – KwaZulu-Natal (2013, 2010a, 2010b)
Department of Health (2010a)

According to population estimates obtained from Statistics South Africa 2009, KwaZulu-Natal ranks second in the number of inhabitants in South Africa and occupy 7.6% (92,100 sq km) of the total land surface of South Africa. The total population was 10, 586 757 in 2009 (21.2% of the total South African population). Approximately 54% of the KwaZulu-Natal population live in rural areas, and 70% of the population are below the age of 35 years. (Department of Education - KwaZulu-Natal, 2013, Department of Education - KwaZulu-Natal, 2010a, Department of Education - KwaZulu-Natal, 2010b, Department of Health - Kwa Zulu-Natal, 2010). The Gross Enrolment Ratio of Grade 1 to 12

in 2013 was 95%. This indicated a significant improvement in access to education in KwaZulu-Natal. There are 2,569 793 pupils attending the public ordinary schools which comprise of 3826 primary schools and 1338 secondary schools (Department of Education - KwaZulu-Natal, 2013).

Unemployment in KwaZulu-Natal which was estimated at 40% intensifies the problems experienced by the population of KwaZulu-Natal, especially the disadvantaged, resulting in poor access to proper nutrition and health care (Shasha et al., 2011, Kingdon and Knight, 2006). The burden of poverty in KwaZulu-Natal is high with 63-82% of the households having an income of less than R800 per month (Day et al., 2011). Poverty together with migration patterns, the quadruple burden of disease and other social determinants of health has therefore resulted in changes in the demographics of the community. Integrated and co-ordinated services at a community and household level were therefore required. This has consequently led to the implementation of the flagship programme of the province namely Operation Sukuma Sakhe (Department of Health - Province of KwaZulu-Natal, 2013).

The highest (33%) burden of HIV in South Africa is found in the province of KwaZulu-Natal. Tuberculosis, pneumonia and diarrhoea, which are three of the leading causes of Years of Life Lost in KwaZulu-Natal, are directly related to HIV. This suggests that deaths from HIV could be the leading cause of Years of Life Lost in the province. Despite the increasing burden of disease in KwaZulu-Natal, life expectancy for both males and females has increased since 2001 as a result of improved access to health services together with an apt response to the burden of disease (Department of Health - Province of KwaZulu-Natal, 2013).

Children have been given priority in South Africa (Shung-King et al., 2000). Therefore, one of the strategies that was employed to address the inequities of the past was The National Nutrition Programme (1994). This programme aims to improve the learning capacity of learners and promote self-supporting school food gardens and healthy lifestyles amongst learners (Department of Education, 2009).

Another priority area identified by the Department of Health for children was the expansion of the health promoting schools programme. The assessment and accreditation of health promoting schools was therefore fast-tracked through effective partnerships that were formed. The database for health promoting schools that was developed in-house was finalised in 2009/10 to improve monitoring and reporting. Sustainable programmes were implemented at the health promoting schools, however a lack of an integrated Health Promotion Strategy as a result of the national framework still being in draft resulted in duplication, missed opportunities and increased costs. Furthermore, challenges that are faced by the education system include a decrease in staff which has subsequently resulted in teachers having overloaded syllabi and overcrowded classes (Swart and Reddy, 1999). In addition,

health personnel have to deal with a range of other priorities besides providing services in schools. This resulted in the Health Promoting Schools Network being given low priority (Swart and Reddy, 1999). Further problems encountered are that the geographical boundaries are different between the departments of health and education (Edwards-Miller and Taylor, 1998) and there is an uneven physical distribution of resources across different communities (Swart and Reddy, 1999). This is therefore an area of concern as it does not encourage intersectoral collaboration. Moreover, targets for the accreditation of health promoting schools were also not met due to inadequate resources for decentralisation of accreditation. Currently there are 243 accredited health promoting schools in KwaZulu-Natal (Department of Health - KwaZulu-Natal, 2014, Department of Health - Kwa Zulu-Natal, 2010).

Moyses et al. (2003) noted that children have better health in supportive schools with developed health promotion activities than children in non-supportive schools. Moreover, it has been observed that inequalities in oral health are more evident in non-supportive than in supportive schools (Moyses et al., 2003:216). Evidence shows that prior to 1994 the delivery of school health services was poor especially in the rural areas. To address this gap the National School Health Policy was launched in 2003 to assist in the promotion of health especially in the previously disadvantaged areas. A study conducted by Shasha et al. (2011) showed that there was a lack of transport to conduct school visits. Also schools were placed in distant areas and were not easily accessible due to poor road conditions. Therefore school health services experienced difficulties that resulted in little time available for health assessments and education (Shasha et al., 2011).

Health services in KwaZulu-Natal follows the District Health System which is based on the principles of the primary health care approach and includes a comprehensive, integrated and sustainable preventive, promotive, curative and rehabilitative health care service (Barron, 2000). Many challenges however face the implementation and sustainability of the primary health care approach. Current services are not adequately integrated and there is a failure in the transition of programmes from a curative to a more preventative and promotive approach. Present infrastructure and equipment for health is not adequate. Additionally, specialised rehabilitation centres are not present in rural areas. The province also faces challenges in human resources which includes a lack in training (Department of Health - Province of KwaZulu-Natal, 2013). Moreover, with the majority (54%) of the population in KwaZulu-Natal living in rural areas, they face many challenges in terms of accessibility to health services because of poor roads and transport (Department of Health, 2010b).

Oral and dental health forms part of the Community Health Centres programme. Community Based Services which is a component of this programme includes school health. Priorities for oral health in KwaZulu-Natal included i) aligning the provincial oral health strategy to the national strategy; ii)

defining the service delivery platform and package of services for oral and dental health and iii) the re-orientation of oral health services from a curative to a preventive approach (Department of Health - Kwa Zulu-Natal, 2010). A Ten Point Plan was further drafted as one of the strategies for the improvement of dental health services in KwaZulu-Natal. These strategies included:

- Establishing comprehensive preventive and promotive oral health programmes which would include integrated school-based tooth brushing programmes, fissure sealant programmes and integrated screening and education programmes,
- Establishing a comprehensive pain and sepsis relief programme,
- Reducing the extraction to restoration ratio,
- Establishing regional maxillofacial, orthodontic and denture services,
- Mobile dental clinics,
- A centralised Dental Technician and Laboratory service,
- Implementing proper infection control measures, and
- Establishing a provincial dental school and to increase specialist training (Department of Health - KwaZulu-Natal, 2012).

Reports showed however that there were huge constraints in human resources which were affecting the sustainability of oral health services. Vacancy rates for oral hygienists were 18.9%. This therefore jeopardised the sustainability of prevention, promotion, screening and school-based programmes at primary health care level. Reports further indicated that there was an increase in the extraction to restorations ratio as a result of a lack of resources and budgetary constraints (Department of Health - Kwa Zulu-Natal, 2010). This situation is not unique to the province of KwaZulu- Natal as a similar situation is found in Gauteng (Mickenautsch et al., 2007). Furthermore, the target for the number of schools with brushing programmes were also not met as a result of the inefficiencies at district offices and high vacancy rates of oral hygienists that was due to a moratorium being placed on the filling of posts (Department of Health - KwaZulu-Natal, 2012, Department of Health - Kwa Zulu-Natal, 2010). In order to improve the oral health services of KwaZulu-Natal the government allocated R13.6 million to fill in vacant dental practitioner posts and was also committed to modernising dental equipment (Department of Health - KwaZulu-Natal, 2012).

Subsequently, 34 Community Service dentists were employed to strengthen the oral health services at primary health care level. In an attempt to improve school oral health programmes, the Department of Health also recruited 21 oral hygienists and requested the universities to recruit more oral hygienists for training. The launch of the school health programme in September 2012 resulted in oral health education being provided to 1594 schools. A partnership is also being formed between the

Department of Health and Colgate World of Care to support the school health programmes with the provision of mobile dental services. Currently there are three Dental Mobile Units in the eThekweni, Umzinyati and Umgungundlovu districts that have employed four dental therapists and two dental assistants. In the time period of this report the Department of Health has also strengthened oral health services by providing 161 dental prostheses to elderly patients (Department of Health - KwaZulu-Natal, 2014).

The literature discussed has important implications for oral health promotion and prevention interventions. It is imperative that interventions implemented are evidence based so that target groups and indicators can be identified at a district level thereby ensuring the success of the programme. The interventions implemented in this study were therefore evidence based. A conceptual framework for an oral health promotion intervention at the schools was therefore developed to serve as a framework for this study. The next chapter discusses the theoretical reasoning that was used to develop the conceptual guide for this study.

CHAPTER 3

DEVELOPMENT OF A CONCEPTUAL FRAMEWORK

The integration of a school oral health promotion programme into the Health Promoting School Initiative is multifaceted and cost effective. Schools have existing structures and support in place that would be able to reinforce information on health in addition to strengthening links with the community and support services (Nutbeam et al., 1993a, Green and Kreuter, 1991). Evidence in the literature suggests that integrated school health promotion programmes that are well planned can effectively promote healthy behaviours in children as opposed to just the conventional curriculum-based health education (St. Leger, 1999, Nutbeam, 1992, Green and Kreuter, 1991, Connell et al., 1985). Effective and efficient interventions however require an evidence-based approach to guide advocacy, set priorities and display value (Mc Queen and Jones, 2007, Rychetnik and Wise, 2004). Although the importance of an evidence-based approach has been established, the evaluation of interventions is not adequately developed and has not been properly documented (Petersen and Kwan, 2004).

3.1 The relevance of a mixed methods approach for oral health promotion evaluation

The promotion of health and oral health that utilises multiple strategies has developed over the years since the Ottawa Charter (1986). However, the use of these multiple strategies can complicate the evaluation of health and oral health promotion (Nutbeam, 1998, World Health Organization, 1986). The methodologies used for evaluations and the evaluation of the implemented interventions and processes were not appropriate. Additionally, specified quality outcome measures and short periods of time to assess changes further complicated evaluation (Petersen and Kwan, 2004). There was therefore a need to improve the approach to evaluation to ensure effective health and oral health promotion interventions. In particular a more extensive array of quality outcome measures that would be relevant to these interventions needed to be developed (Watt et al., 2001, Kay and Locker, 1998, Sprod et al., 1996, Tones, 1994). Both qualitative and quantitative methodologies would therefore be required to evaluate these outcome measures (Watt et al., 2001).

Qualitative methods collect, analyse, interpret and present narrative information as opposed to quantitative methods that presents the collection, analysis and interpretation of numerical data (Teddlie and Tashakkori, 2009b). The research question in quantitative methodology is usually presented as a research hypothesis where predictions are made by researchers about associated social phenomena prior to conducting a study. These predictions are based on theory, previous research

studies or an underlying principle. These questions subsequently give direction to the study and relate to unidentified aspects of a phenomenon (Teddlie and Tashakkori, 2009b). The qualitative approach on the other hand uses participants to contribute data which is subsequently interpreted by the researchers and constructed into reality (Eichelberger, 1989). The multiple realities that emerge are indicative of the qualitative approach. This therefore suggests that research questions in the qualitative approach cannot be formulated prior to the research study but rather evolve and be modified as the study develops. The insight of varied people must be established including the backgrounds and contexts within which they are studied (Mertens, 2010). Multiple data collection mechanisms are therefore utilised for the qualitative approach which includes document reviews, interviews and observations. Thematic data analysis using inductive and iterative techniques is therefore used for the narrative data obtained.

Although the qualitative and quantitative methodologies are different in their approach, they are both equally methodical and strict in their approach to planning and execution of research studies (Denzin and Lincoln, 1994). Qualitative research in health promotion aims at providing information on population experience and the community environment that strengthens, sustains or weakens health (Nutbeam, 1998). The value of combining different research methods for the evaluation of health promotion interventions has been identified by researchers in this field (Baum, 1995, de Vries et al., 1992, Steckler et al., 1992). Evidence shows that mixed methods research can provide the strengths that counteract the limitations of both qualitative and quantitative research. It affords more inclusive evidence on a research problem than either qualitative or quantitative methods can obtain alone. Furthermore, mixed methods assists with the response to questions that cannot be answered by both these methods on their own. Moreover, collaboration amongst researchers and the use of multiple paradigms is encouraged. In addition, the use of mixed methods allows the researcher flexibility in the choice of methods to address the research problem (Creswell and Plano Clark, 2007). The utilisation of multiple methods has also provided the opportunity of accumulating evidence from varied sources in response to the same question. This concept is referred to as 'triangulation' and consists of three types namely data source, researcher and methods triangulation (Nutbeam, 1998).

To provide a better understanding and add value to this study, the researcher selected a mixed methods approach. There were two stages to this study. The inductive stage was used to understand complex phenomena. Research questions focused on qualitative data using interviews (Appendix 1) and a questionnaire (Appendix 2) to support findings in quantitative data. Quantitative data was collected concurrently to measure the dental needs of the community and to conduct a situational analysis using a questionnaire (Appendix 2), data capture sheet (Appendix 3), and WHO DMFT Tool (Appendix 4). Various stakeholders were interviewed to gain insight on current oral health promotion practices. Using this approach therefore allowed the combination of evidence and the corroboration of

findings between the qualitative and quantitative data that was collected (Cresswell, 2003). The deductive stage was used to measure change from the implemented programme. Qualitative data was collected using focus group discussions (Appendix 5). Using data source triangulation strengthened the study by providing comprehensive evidence of the research problem. The interpretation of the data was qualitative, quantitative and combined to generalise results and predict and understand the theoretical basis of the study. In this study therefore, qualitative and quantitative methods were mixed for study design, data collection and data interpretation to provide strength to explain and enhance the data collected.

3.2 Development of a Conceptual Framework

An important component for planning an effective school-based intervention is the utilisation of multiple theories and models (Allensworth, 1994). A conceptual framework was therefore developed by using various theories and models to answer the critical questions in this study and to illustrate the viability of including oral health promotion into the Health Promoting School Initiative.

3.2.1 Theoretical Basis of the Conceptual Framework

The capacity to utilise schools to promote health of learners as they do to improve their education has been recognised by the World Health Organization (World Health Organization, 1998b). Evidence of this is clearly articulated in the following quotes or excerpts:-

- "Health promotion in schools can improve children's health and well-being" What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach? (World Health Organization, 2006c:4).
- "Health is inextricably linked to educational achievements, quality of life, and economic productivity. By acquiring health-related knowledge, values, skills and practices, children can be empowered to pursue a healthy life and to work as agents of change for the health of their communities" (World Health Organization, 1997c:1).

The central challenge facing South Africa is undoubtedly the need to build a culture of teaching and learning in all schools that would provide quality education for all learners. The value of health promotion as a vital intervention strategy for the South African health system has been recognised. In addition the significance of the 'settings approach' as a key element in advancing the development of health promotion within the Health Promoting School Initiative in South Africa has been identified nationally (Onya, 2007). This would mean that schools can therefore make it possible for children and

adolescents to avoid issues with health. This can be achieved by assisting them to gain the knowledge, attitudes, values, skills and services they require to be healthy (World Health Organization, 1997c). As a result this can contribute to children's and adolescent's health now and in their lives as adults, thus enabling them to contribute to their communities and nations now and in the future (Kwan et al., 2005, World Health Organization, 1997c).

Inferences for oral health therefore suggest an integrated approach at schools for oral disease prevention and oral health promotion. This can be achieved through the incorporation of oral health promotion into general health promotion with the focus on common risk factors (World Health Organization, 2003b, Sheiham and Watt, 2000). This therefore provides a foundation for the incorporation of oral health promotion into the Health Promoting School Initiative.

3.2.2 Models for planning oral health promotion interventions

In addition to the theoretical considerations discussed above, various models were investigated to identify the ones that would be most applicable to this study. To build a sustainable intervention, oral health which is influenced by multidimensional factors, would need to be integrated into the social system. Oral health promotion programmes would therefore need to consider the complex relationship between context and behaviour and the importance of influencing systems, structures and individuals to support change (Speller et al., 2005). Systems models therefore can provide stakeholders in-depth insight into the larger system they are embedded in and a model for integrating known elements with the unknown (Hirsch et al., 2011, Metcalf et al., 2011, Homer and Hirsch, 2006). Frameworks for oral health promotion should therefore look at macroinfluences (health strategies for populations, economic systems, policy formulation), mesoinfluences (community, work place, schools) and micro influences (psychosocial skills to cope with disease, ability to change health behaviours by making healthier choices) (Metcalf et al., 2011). The models chosen for the intervention would have to provide a systematic approach that maps the progress of the intervention from inception to dissemination (Riddle and Clark, 2011).

Three models, which were found most appropriate, were chosen for this study, namely the PRECEDE-PROCEED, Community Organisation and Intervention Mapping models. A combination of these three models were used to conduct a needs assessment for oral health at schools; plan and implement an intervention for oral health promotion followed by a review of the programme (Bartholomew et al., 2006, Green and Kreuter, 2005, Bracht, 1998). The advantage of this approach is that it enabled identifying oral health needs and developing, implementing and evaluating an oral health promotion programme in order to attain long term oral health effects.

The PRECEDE-PROCEED model was created as a planning, intervention and evaluation framework. Epidemiology which forms the foundation of the PRECEDE-PROCEED model integrates knowledge from disciplines such as health promotion and policy. The PRECEDE part of the model has four stages which comprises of a series of planned assessments. These assessments include social, situational analysis, epidemiological, educational, ecological, administrative, policy and intervention alignment. This phase enables the researcher to identify priorities and set objectives (Green and Kreuter, 2005). Green and Kreuter (Raingruber, 2013:72) further suggest that communities need to assess their own needs and priorities as health programmes that are formed nationally are not easy to adapt to settings that are unique (Raingruber, 2013). The model assumes that interventions will be effective if they come from the community. They also need to be properly planned based on data collected. Moreover, they need to be viable and approved by the community. Additionally, for effectiveness, interventions would need to incorporate multiple strategies into an organised programme and depend on feedback and progress evaluation (Green and Kreuter, 1992).

The PROCEED component makes up the next four stages, namely implementation, process evaluation, impact evaluation and outcome evaluation. The programme is designed according to priorities and implemented. The implementation of the programme is evaluated in the process stage. This is followed by the impact phase which evaluates the immediate effects of the programme on target behaviour and environmental factors. Lastly, the effect of the programme on health and the social situation measures outcome evaluation (Haveman-Nies, 2010). The purpose of the PRECEDE portion is to identify educational factors that can influence change while the PROCEED portion identifies ecological factors that can influence change. The PROCEED portion further recognises the importance that environment, regulatory, policy and organizational factors have in influencing health.

This model allowed for a needs assessment to be conducted in this study to ensure quality of the evidence that would be relevant to the risks and benefits of the planned intervention. Dental needs were analysed and the programme implemented according to the needs of the population. Impact evaluation was used to measure the short term goals in this study.

The Community Organisation model was the second model that was adapted for this framework. The primary focus of this model was the organisation of health promotion that developed principles based on previous field experiences and multidisciplinary research (Bracht, 1998). Participation was an important factor in this model, therefore individuals and communities needed to be in control. Moreover, the development of this model was influenced by practical experience gained from working with community organisations and the principles of social and community change. The components of organisational development and strategic planning and the theory of community

empowerment further influenced the development of this model (Haveman-Nies, 2010). This model makes certain that the intervention is directed by a methodical framework.

The Intervention Mapping model, identified as the evidence-and theory-based development of health, was used as a framework to design interventions. This was achieved by using theories of behaviour and social change for a holistic approach to school health promotion (Langford et al., 2014, Bartholomew et al., 2001). This model provides a gradual approach to the planning, execution and evaluation of health education and promotion interventions. This model has six stages with the first stage using the Precede model to conduct a needs assessment. An assessment of community capacity is also included in this stage which then results in the desired outcomes of the programme being formulated. The second stage involves the conceptualisation of the intervention and the development and refinement of the programme. Interventions are then selected based on theory and objectives that have been informed by stage two. The programme is then pilot tested in the fourth stage to ensure that it fits the needs of the population. The programme is then adopted, implemented and then evaluated in the last two stages of this model (Bartholomew et al., 2001). This model provided a systematic process to formulate intervention methods and strategies to implement an oral health promotion programme in phase two of the study (Catteau et al., 2013).

It was imperative to use a combination of the three models to identify oral health needs and develop, implement and review the oral health promotion programme. The PRECEDE-PROCEED model was used in the first and third phase of the study as it provided a lucid overview of the various stages of programme planning and demonstrating the importance of the assessment and evaluation phases (Haveman-Nies, 2010). The importance of community involvement cannot be overstated. Therefore, the involvement of the community in the assessment phase can provide a more comprehensive picture of oral health needs and enable support for interventions later in the planning process (Haveman-Nies, 2010). The Community Organisation model was therefore also used as a complement in the first phase of the study. The Intervention Mapping model, which provides a comprehensive account of programme development, was used for the second phase of this study to develop an oral health promotion programme based on the needs of the learners (Haveman-Nies, 2010).

The next section describes the various stages of the conceptual framework and their inter-relationship based on the theory and models that have been outlined above.

3.2.3 Stages of Implementation Process

Globally diseases of the oral cavity are still a major public health concern (Petersen and Kwan, 2010). A similar situation exists in South Africa with dental caries being the most common condition found

in children (Department of Health, 2010a). Oral health has been recognised globally as an integral component of general health. The World Health Organization has proposed a strategy for the prevention of oral disease and the promotion of oral health. This strategy entails the integration of oral disease prevention into the chronic disease prevention and general health promotion programme as they share similar risk factors (Petersen and Kwan, 2010). This strategy could have a greater impact on many more diseases compared to a disease specific approach. Several challenges still exist however for oral health promotion including widening socio-economic inequalities. Moreover, a gap still exists with evidence-based policies and practice to address these inequalities (Kwan and Petersen, 2010, World Health Organization, 2003c). The impact that social determinants have on oral health have also not been satisfactorily considered in public policies (Petersen, 2009, Petersen, 2008).

The study used the theory that evidence based promotion of oral health using the common risk factor approach in settings (in this case the school) could be the most creative and cost-effective way of improving oral health and in turn quality of life (World Health Organization, 2003b, Sheiham and Watt, 2000).

The conceptual framework which looked at the integration of oral health promotion into the health promoting school comprised of three phases: assessment, implementation and review as illustrated in Figure 3.1. Each stage of the framework is discussed based on theory and current literature.

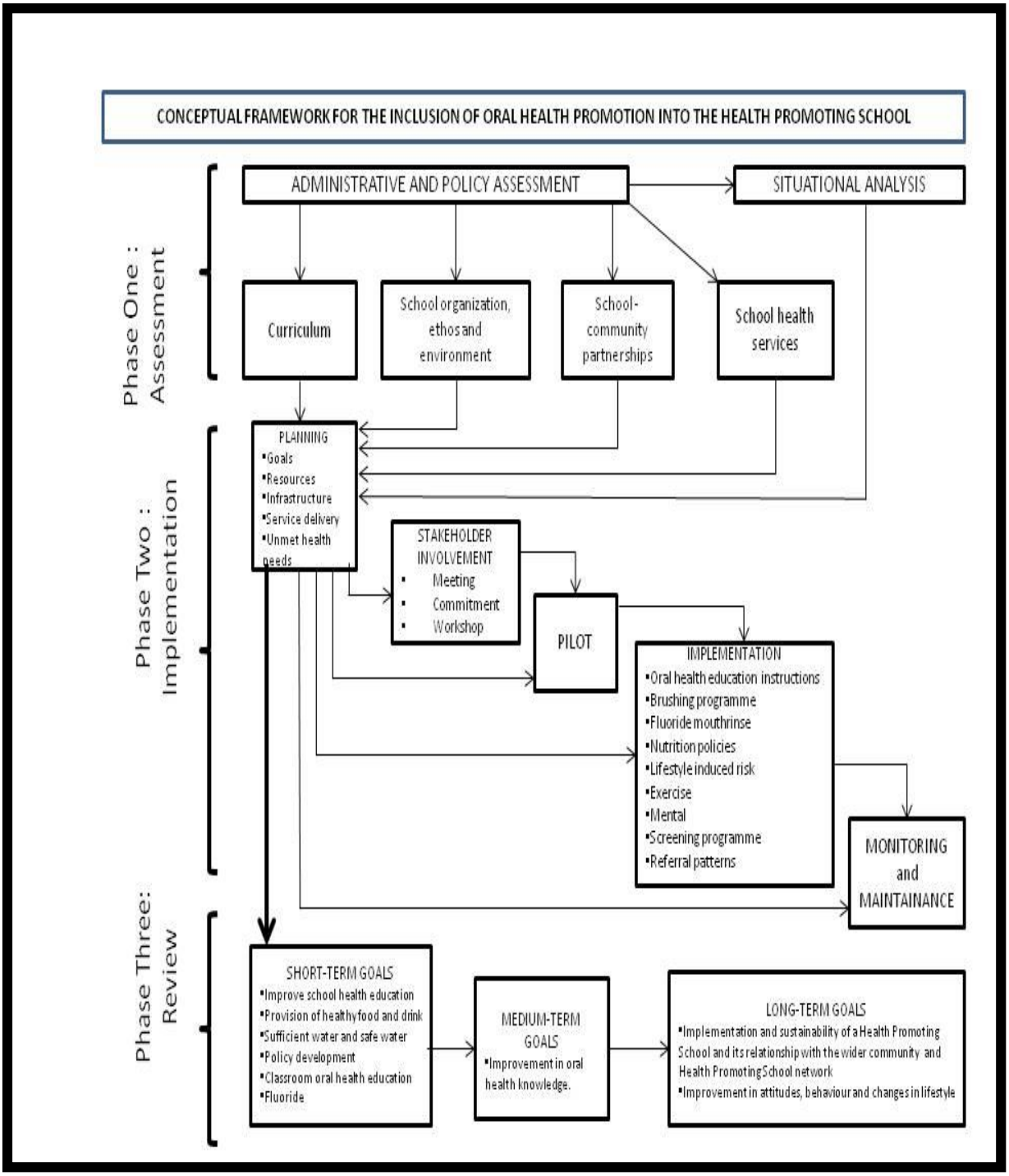

Figure 3.1: Conceptual Framework
Adapted: Health-Promoting Schools Model (WHO, 2003)
The WASH project model of school health promotion (1999)

3.2.3.1 Phase 1 - Assessment

The revised National Oral Health Strategy in South Africa aligns itself to prioritising evidence based approaches as recommended by the World Health Organization (Department of Health, 2010a). This strategy provides guidance to provinces and districts for the development of interventions that address

the community at a local level. The first phase comprised of an administrative and policy assessment and a situational analysis. The administrative and policy assessment facilitated identification of the resources that were required for the proposed intervention as well as problems that could delay the proposed intervention (Green and Kreuter, 2005). A needs assessment, which is a multifaceted and multidimensional process, was conducted to collect evidence to inform current objectives on school health and oral health promotion. The needs assessment further provided information for the new intervention by identifying learners oral health needs, health and oral health service gaps and the health and oral health services required (Bugge and Higginson, 2006). The Community Organisation model was included in this phase to make certain that the implemented intervention dealt with the key factors that influenced oral diseases and to capitalize on sustainability and community engagement.

3.2.3.2 Phase 2 - Implementation

The oral health promotion programme was developed and implemented using the framework of the Intervention Mapping model. This model allowed for collaboration of everyone involved in the planning process, recognised the role of behavioural and environmental factors on oral health outcomes and utilised the theory of health behaviour for the development of the intervention (Fernandez et al., 2005). Intervention strategies were selected based on the refined objectives that were developed. A pilot study to test the planned intervention was then conducted and refined to ensure it met the needs of the population. The refined intervention was then implemented and monitored to ensure effectiveness.

3.2.3.3 Phase 3 - Review

The review phase consisted of short, medium and long term goals. For the purposes of this study only short term goals were reviewed. The evaluation therefore focused on process and impact evaluation. The way in which the intervention was implemented as designed were reviewed in process evaluation (Moskowitz, 1989). The efficiency of the programme to assess whether the programme had created awareness to oral health, was feasible and had adequate resources, was then measured by impact evaluation. This was achieved by assessing the immediate effects of the intervention on target behaviours and environmental factors in addition to their predisposing, enabling and reinforcing determinants.

The planning and formulation of the framework for the incorporation of oral health promotion into the Health Promoting Schools Initiative required the use of a combination of three models. Both qualitative and quantitative methods were chosen for this study resulting in pragmatism being chosen as a research paradigm. The next chapter discusses the methodology used in this study.

CHAPTER 4

METHODOLOGY

4.1 Study Design

An explorative study was conducted to critically analyse the Health Promoting School Initiative as a means of improving oral health promotion service delivery in KwaZulu-Natal. Since the integration of oral health promotion into the school programme is multifaceted, it was necessary to use both qualitative and quantitative research methods. The research design selected was therefore a mixed methods approach (Teddlie and Tashakkori, 2009b). The research paradigm chosen for this study was pragmatism which is the theoretical orientation most often associated with the mixed methods approach. Pragmatism focuses on "what works" as the facts that relate to the research questions that is being investigated and recognises that the researcher's values impact on the interpretation of the results (Tashakkori and Teddlie, 2003a).

Mixed methods is defined as "research in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or program of inquiry" (Tashakkori and Creswell, 2007:4). The use of this design made it possible for the researcher to maximise the interpretation of the data collected. It also improved the quality of the data obtained from all participants by ensuring that the views of all stakeholders were optimised. Mixed methods also enhanced the reliability of the tools by improving the value and suitability of the various types of tools that were used in this study.

The way in which the qualitative and quantitative approaches are combined determines the choice of mixed methods design that is selected. To achieve validity in this study, triangulation was selected for evaluation. Evidence from a variety of sources such as school records, minutes of meetings, documents, questionnaires and interviews was used to investigate the research questions and draw conclusions based on the overall data collected. This approach is referred to as data source triangulation (Torrance, 2012, Green and Tones, 1999). Methods triangulation, which involved using various methods such as focus group discussions, interviews and self-administered questionnaires, was also used to achieve validity (Gifford, 1996, Tilford, 1996). Triangulation allows for more robust conclusions and recommendations to be made by using various forms of evidence. The evaluation comprised of interviews (Appendix 1) with provincial and district managers, self-administered questionnaires (Appendix 2) that was completed by the principals of the twenty three schools, data capture sheet (Appendix 3) completed by the researcher, the WHO DMFT Tool (Appendix 4) to

assess the dental needs of the learners and focus group discussions (Appendix 5) at the selected schools. The evaluation process in this study was based more on qualitative methodology to add to the richness and depth that was necessary to understand the context in which the oral health promotion programme was set. It has been established that qualitative methodology permits the exploration of a wider scope of dimensions that includes the populations understanding and experience, and the manner in which community processes, organisations and relationships work (Mason, 2002, Braun and Clarke, 2013). It was necessary however, to complement the data by including quantitative methodology to present a broader overview of the system.

This study was an explorative, experimental and a longitudinal study that was divided into three phases that will be further discussed.

4.2 Data Collection

This study was conducted in the eleven districts of KwaZulu-Natal where schools and six-year-old learners were identified and then selected to be part of the study sample. The three distinct phases of the study were developed with the selected schools and learners. A description of the sampling process, data collection and data analysis for each phase of the study is presented in this section.

4.3 Methodological Approach

The different phases of the Methodological Approach as outlined in Table 4.1 will be discussed.

Table 4.1: Methodology

	ACTIVITY	DATA COLLECTION
PHASE 1 **1.1Assessment of Policy documents**	Statements in policy will include:- a. Oral health promotion and school health services. b. Budgetary allocations for oral health promotion. c. Nutrition and food services. d. Community and stakeholder involvement.	Interview Schedule • KwaZulu-Natal Department of Health – Deputy Manager of Health Promotion. • KwaZulu-Natal Department of Health - Assistant Manager of Health Promotion and School Health. • KwaZulu-Natal Department of Basic Education – Manager of Basic Education.
1.2 Situational analysis	a. Current situation, socio-demographic profile, socio-economic status, health and oral health status, influences on health and health actions, target groups, school health services, do kids use fluoride toothpaste, does fluoride rinse programme exist, diet and nutritional status, available dental health services, infrastructure, resources, funding, basic amenities, community strengths, community attitudes on oral health, cultural information, community participation, NGO involvement, other community based activities, epidemiology. b. Dental Screening.	Questionnaire • Principals Reports, screening. Data capture sheet. WHO DMFT Tool
1.3 Assessment of School curriculum	a. Look at syllabus for inclusion of oral health promotion into general health promotion at Health Promoting Schools.	Reports, records, syllabus, teachers prep book, questionnaire.
1.4 Investigation of Oral Health Promotion activities incorporated into teaching practices	a. Explore oral health promotion practices of teachers and mechanisms used to implement oral health promotion programmes. b. Identify if there are oral health promotion programmes.	Reports, questionnaire.
1.5 Conduct a review of current health promoting schools initiatives	a. Budgetary allocations, staffing, infrastructure, support from Department of Health and Education, Security, Social Welfare, community involvement, school health team, health promotion and oral health promotion coordinators, training.	Reports, statistics, records, interviews.
1.6 Development of oral health promotion programme	a. Identify objectives, priorities, resources available to formulate oral health promotion programme in line with unmet oral health needs.	Screening, reports, interviews.
PHASE 2 **Implementation of Oral Health Promotion Programme**	Gatekeeper permission obtained from the Department of Education and the identified schools. Identify/form a school health team, appoint health promotion co-ordinator, stakeholders. Identify resources available and what is required. Available budget. Meeting with school health team and stakeholders explaining programme to be implemented. Principal will have meeting with rest of staff. Second meeting to establish willingness and commitment to the programme and identification of difficulties of doing the programme and suggestion of solutions to overcome potential problems. Workshop with teachers and parents on oral health promotion programme. The programme will be monitored for efficiency by the health promotion co-ordinator.	Stakeholder interviews, schedules for implementation, school reports, records on budgetary allocation.
PHASE 3 **Review of Intervention**	The intervention will be reviewed for its strengths, barriers to implementation, opportunities and areas for improvement. An enquiry into how budgets and stakeholders affect the intervention will be done. Assess if the intervention is sustainable.	Records, post interviews with focus groups, content analysis of documents.

4.3.1 Phase 1 – Assessment (Figure 3.1 & Table 4.1)

A situational and needs analysis made up the first phase of the study that comprised of an analysis of current health and education documents, interviews with managers from the Department of Health and Department of Education (Appendix 1), a questionnaire for school principals (Appendix 2), a data capture sheet to record what facilities were currently in place at the schools (Appendix 3) and a dental

examination of selected six-year-old learners using the WHO DMFT Tool (Appendix 4). Resources, infrastructure and service delivery currently in place was also taken into consideration.

4.3.1.1 Review of Documents

It was imperative in this study to determine to what extent oral health promotion was included in documents and health programmes at all stages of the South African health system. This therefore entailed examining documents at national and provincial levels to investigate the presence of oral health activities in policies and programmes both nationally and provincially.

Current policy documents, strategic plans and annual reports from the Department of Health and Department of Education were reviewed for the identification of policies and priorities in health and oral health promotion. Electronic formats of these documents were obtained using the databases of both the national and provincial Department of Health and Department of Education of South Africa. Documents from 2001 to 2012 were analysed. The documents reviewed are outlined in Table 4.2. Documents were first identified, statements related to oral health and oral health promotion were sited and priority groups and the level of management were then identified (Singh, 2005).

TABLE 4.2: National and Provincial Health Policy Documents/Strategic Plans/Annual Reports

Department	Document
National	
Health	South African National Oral Health Strategy (2004)
Health	National Oral Health Strategy (Draft:2010)
Health	Policy guidelines for Youth and Adolescent Health (2001)
Health	School Health Policy and Implementation Guidelines (2011)
Health/Basic Education	Integrated School Health Policy (2012)
Provincial	
Health	Strategic Plan – KwaZulu-Natal 2010-2014 (2010)
Health	KwaZulu-Natal Department of Health – Vote 7 Annual Report 2011/12 (2012)

4.3.1.2 Study Population

Probability or purposive sampling is the strategy of choice in mixed methods sampling techniques. Probability sampling involves "selecting a relatively large number of units from a population, or from specific subgroups (strata) of a population in a random manner where the probability of inclusion for every member of the population is determinable" (Tashakkori and Teddlie, 2003a). Maxwell as cited

in Teddlie & Tashakkori (2009) defined purposive sampling as a type of sampling in which "particular settings, persons or events are deliberately selected for the important information they can provide that cannot be gotten as well from other choices" (Teddlie and Tashakkori, 2009c: 170).

The study population for the first phase of the study comprised of managers from the provincial Department of Health and Department of Education, district managers from the Department of Health, Health Promoting Schools, their principals and six-year-old learners from the eleven districts of KwaZulu-Natal.

Purposive sampling was used for the selection of provincial and district managers from the Department of Health and Department of Education for the interviews so that representation of the study population was achieved.

Cluster sampling which is a type of probability sampling was also used in this research project. Multistage cluster sampling which is a type of cluster sampling, was used for the selection of schools in the first stage of sampling and then the units of interest, which in this study were six-year-old learners, who were randomly selected in the second stage of sampling for the dental examinations.

4.3.1.3 Selection Procedures

Provincial managers from the Department of Health and Department of Education and district managers from the Department of Health were contacted to participate in the study. The selection criteria for managers were their direct involvement in oral health.

At the time of the study there were 154 credited Health Promoting Schools in KwaZulu-Natal. Taking into consideration the enormity of the study, a power calculation was conducted selecting twenty three schools (two or three from each district) to achieve a confidence level of 90% and a 15% error rate. Using multistage cluster sampling the selection was based on the quintile status of the schools. Quintile status ranges from Quintile 1 which is your poorest to Quintile 5 which is your least poor. Quintiles 1 to 3 are no fees schools while Quintiles 4 and 5 are fees paying schools. The study sample (n=23) comprised of two or three schools from each district and four to five schools from each quintile as shown in Table 4.3.

Table 4.3: Number of schools selected according to districts and quintiles

DISTRICT	TOTAL NUMBER OF HPS IN DISTRICT	NO. SELECTED FOR STUDY	*QUINTILE STATUS
Ugu	18	3	5; 5; 3
Umgungundlovu	6	2	5; 1
Uthukela	17	2	5; 4
Umzinyati	16	2	4; 3
Amajuba	27	2	3; 2
Zululand	16	2	3; 3
Umkhanyakude	7	2	1; 2
Uthungulu	26	2	5; 2
iLembe	7	2	1; 2
eThekweni	4	2	4; 4
Sisonke	10	2	1; 4
TOTAL	**154**	**23**	

***Quintile 1 – poorest school**
Quintile 5 – least poor school

4.3.1.4 Sampling Techniques

Sampling techniques included interviews with identified provincial and district managers, questionnaire for school principals at the twenty three selected schools, a data capture sheet that was completed by the researcher at the twenty three schools and a dental examination that was conducted on the selected six-year-old learners at these schools.

4.3.1.5 Interviews with Provincial and District Managers

The study sample for the interviews comprised of the manager of Basic Education involved with health promotion from the Department of Education and the provincial and district (eThekweni, Ugu, iLembe and Uthukela) Health Promotion Managers from the Department of Health.

Gatekeeper permission was first obtained from the Department of Health and the Department of Education (Appendix 6). All participants included in the study sample for interviews were then informed telephonically of the planned research and an information and consent sheet (Appendix 7) was e-mailed to them. Once consent was received, the interview schedule (Appendix 1) was submitted electronically to each participant prior to the interview to familiarise them of the intended questions. Interviews were either face-to-face or telephonic. Participants who were not available for the face-to-face or telephonic interviews asked to submit electronic responses. Participants that were slow with responses were contacted regularly to motivate them to respond to the request. The interviews were conducted by the researcher and permission was obtained to tape record the

proceedings. Participants were assured that confidentiality would be maintained at all times. Notes were also taken by the researcher. These were then verified with the tape recordings and then electronically transcribed. Transcripts were then sent to the participants for verification. The duration of the interview was forty-five minutes.

The questionnaire endeavoured to establish attitudes of managers towards the integration of oral health promotion into the Health Promoting School Initiative, their knowledge of what is currently in place and the identification of barriers and obstacles to this process. Only four of the eleven district health managers participated in the study as the data saturation technique was used.

4.3.1.6 Questionnaire for School Principals

The study sample for the questionnaire was the twenty-three principals from the identified Health Promoting Schools. Gatekeeper permission was first obtained from the Department of Education (Appendix 6). An invitation letter and consent form (Appendix 8) was then sent to the principals of the twenty-three identified Health Promoting Schools explaining the programme and for permission to conduct the research at their school.

The self-administered questionnaire (Appendix 2) consisted of closed and open ended questions focusing on the Health Promoting School Initiative. The questionnaire examined the inclusion of oral health education into the curriculum and the types of school health services available to schools. It also examined the state of the school environment and type of security present. The questionnaire further investigated whether health promotion training was provided for staff and if there was collaboration between the school and community. The availability of nutrition and food services and the presence of physical education and leisure activities were also examined. The presence of school policies including policies specific to oral health were also investigated. The questionnaire also examined the barriers and challenges facing the staff for the implementation of oral health promotion programmes.

The questionnaire was posted to the principals, a time period was given for the completion of the questionnaire, and it was then collected from the school.

4.3.1.7 Pilot Study for Questionnaire

A pilot study was conducted to test the questionnaire (Appendix 2) at four Health Promoting Schools in KwaZulu-Natal that were not included in the study. The questionnaire was completed by the school principals at these schools and then refined by the researcher as required.

4.3.1.8 Data Capture Sheet

A data capture sheet (Appendix 3) was used to establish the geographic location of the schools, the status of the environment of the schools and the community support services that were available to the school. This sheet comprised of close ended questions that was completed by the researcher and field assistants on their observations and questions to the principal and teachers.

4.3.1.9 Dental Examination

The total number of Grade 1 learners attending the twenty three identified schools was 2402. Using power calculation with a confidence of 95%, 331 learners were identified for the dental examination. To ensure an equal number of learners examined per school, 15 learners were selected per school for the study sample. An information sheet and parental consent forms in IsiZulu (Appendix 9) and English (Appendix 10) were sent to all parents of Grade 1 learners at the identified schools requesting consent for the dental examination. Systematic random sampling was used to identify the participants by randomly selecting learners from approved parental consent forms that were submitted to each school. Children that did not have parental consent were not examined and assent was obtained from the identified learners prior to the examination.

The researcher identified an appropriate room/space in the school were the oral examination was conducted. The child was required to sit on a chair and tilt the head slightly backwards while the examination was in progress. A visual examination using natural sunlight and a wooden spatula was used to retract the cheek or tongue. No instruments were used in the mouth. Thus the process was non-invasive. The entire examination per learner lasted for 5 – 7 minutes. Optimal infection control procedures were maintained during the examinations using gloves and masks for barrier protection. Gloves and spatulas were changed after every patient. Intra examiner reliability was maintained by repeating every fifth oral examination done. This was in accordance to World Health Organization standards for oral health surveys (World Health Organization, 1997b).

As a result of the study being conducted over a vast area, field assistants were employed to assist with the dental examinations. They were calibrated for visual dental caries diagnoses using the method developed by the British Association for the Study of Community Dentistry (BASCD) with intraoral photographs to a kappa score of 0.90 for inter examiner reliability (Boye et al., 2013). A decayed tooth was only recorded if there was a visible break in enamel and missing teeth were only scored if it was due to caries. There was no treatment score for arrested decay and no pain on deciduous teeth.

A dental examination was conducted to determine dental status using an Oral Health Screening Form based on the WHO DMFT Tool (Appendix 4). The dental examination consisted of an examination of the oral cavity and dentition for the recording of caries and treatment needs of six-year-old learners. Learners requiring further dental management were referred to the nearest dental clinic. A framework for integrated oral health services was introduced into the school based on the unmet oral health needs.

4.3.2 Phase 2 – Implementation (Figure 3.1 & Table 4.1)

The second phase of the study comprised of the implementation of an oral health promotion programme based on the needs of the learners at the various schools. A tooth brushing programme was implemented. The focus of this programme was to assess the strengths, weaknesses and feasibility of programme implementation rather than the outcomes.

Telephonic consultations were first held with the school principals and members of the team responsible for health promotion at the various schools to establish their willingness and commitment to participate in the research programme. Appointments were then made with the schools for a visit by the researcher. At these appointments information acquired from the situational analysis was imparted to the members of the school health team. Action plans developed were based on the information obtained from the situational analysis. This included information on the physical, organisational and psychosocial school environment that would be conducive to the oral health of learners, teachers, families and community members (World Health Organization, 2003b). Further action plans included reduction of risk factors associated with oral health, improvement of oral health knowledge and attitudes and the development of skills and behaviours for good oral health (World Health Organization, 2003b). Priorities, resources and stakeholders were identified from the discussions. Interventions were formulated and implemented according to the needs of the learners.

Interventions included the integration of oral health promotion into general health promotion in order to address the underlying physical, psychological, cultural and social determinants of oral and general health. Learners were also empowered with the knowledge, skills and opportunities to develop healthy

lifestyles. The interventions included activities such as identifying the functions of healthy teeth; the demonstration of correct brushing techniques; demonstration of safe toothpaste use and proper toothbrush storage; identifying nutritious meals, snack foods and beverages to improve general and oral health; the identification of oral health personnel; to follow school safety rules during activities to avoid dental and facial injuries; access to clean drinking water and proper sanitation and regular dental screening. The programme was implemented and monitored for efficiency.

A mobile messaging application was set up with all participants in charge of the programme at the identified schools to liaise with the researcher and each other to exchange ideas and discuss challenges they were facing.

Of the twenty three schools that were selected two schools refused to partake in the research project due to time constraints in their teaching programme and one school was excluded because they had not completed the questionnaire from the first phase. Although 72.7% of the participants indicated that they had oral health services in place, there were inconsistencies in these services. It was therefore decided to implement the oral health promotion programme in the remaining twenty schools. A memorandum of understanding (Appendix 11) was signed between the researcher and the school principal.

4.3.3 Phase 3 – Review of Intervention (Figure 3.1 & Table 4.1)

The data collection for Phase 3 in this study comprised of a questionnaire (Appendix 5) directed at members of the school health team who made up the focus group. Focus group discussions are described as a different strategy for data collection involving both an interview and observational technique (Johnson and Turner, 2003). These discussions as defined by Krueger and Casey (Teddlie and Tashakkori, 2009:228) are intended to acquire insight on a specific area of interest in a permissive and non-threatening environment. They recommended that the group should comprise of between five and ten homogeneous participants and that the discussion should not exceed two hours (Teddlie and Tashakkori, 2009a).

Appointments for these discussions were made telephonically with the school principal six months after the implementation of the programme. A convenient time was chosen according to the availability and convenience of the members of the school health team. The principals were telephoned a week before the scheduled appointment to remind them of the appointment. The interviews were tape recorded with permission from the members of the focus group. The duration of the interviews was between forty-five minutes to an hour.

The questions for the interview were informed by the outcome of the interventions implemented in Phase 2. The questions for the interview examined the opportunities and benefits identified by the members of the school health team as well as the barriers and challenges that faced them. Questions also focused on the support that was available from the community, stakeholders, Department of Health and Department of Education. The availability of budgets for oral health promotion programmes was also investigated. Opinions were also asked on whether school health policies should include oral health promotion and whether oral health promotion should be included in the curriculum and training of teachers. Questions further examined what was sold at the tuck shops and by vendors at schools. Strategies employed to control what was sold was also investigated. The school health team was also asked to make recommendations on how the programme could be improved.

Although the data saturation technique was used for the focus group interviews, all twenty schools were given appointments. However, only thirteen schools were visited due to some schools being unavailable for the scheduled appointment upon arrival of the researcher and some roads to the schools being inaccessible due to bad weather.

Although for a research project of this nature the reviews should be long term, it was not possible to follow this project through an indefinite period. Only the short term goals were measured to determine the feasibility of the programme. Short term goals included access to school health education, selection of healthy foods and drinks, availability of sanitation and safe water, documented evidence of policy development, records on classroom oral health education and access to additional fluorides depending on budgets and resources that were available. The interventions were evaluated to assess whether they were delivered as designed. The evaluation cycle in Figure 4.1 was used for the evaluation process.

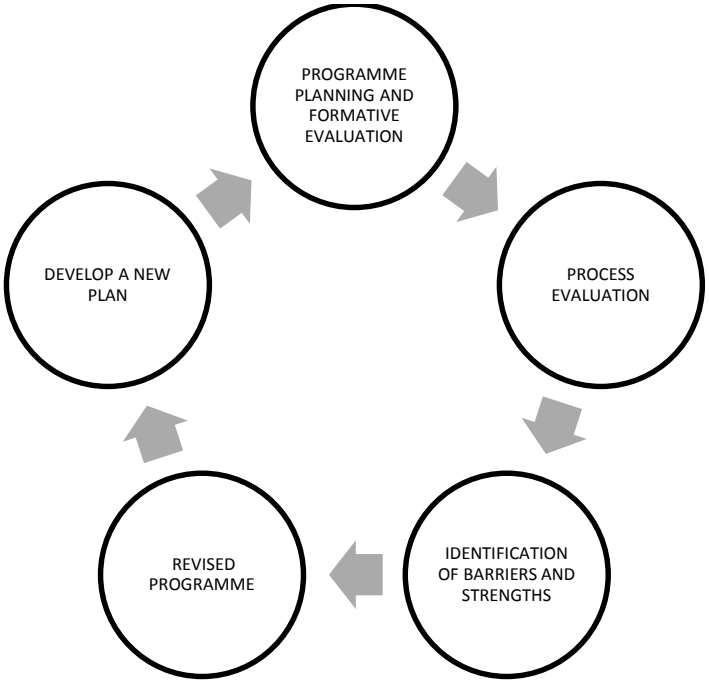

Figure 4.1: Evaluation Cycle

Process evaluation examined the extent to which the programme was delivered as designed (Moskowitz, 1989). The following questions were answered:

- How well was the programme implemented?
- Did the intervention reach the intended target recipients?
- What proportion of the target recipients actually received the intervention?
- Was the intervention acceptable to the recipients?
- What was the satisfaction level of the recipients?

Barriers and strengths of the programme were identified. As only short term goals were reviewed, impact evaluation was used to measure the efficiency of the programme.

The thirteen focus group discussions were held in the staff rooms at the schools. Members of the focus group were questioned on how well the implementation of the intervention was managed at their schools. They were asked to identify benefits and challenges to the implementation of the intervention. They were also questioned on whether there were sufficient resources available at their schools for the implementation of the programme and whether they thought that this intervention was economically viable. The members were further questioned on the inclusion of oral health promotion into the school curriculum as well as in their training as educators. The member's opinions on whether oral health promotion should be part of school policy were also examined. It was also important to examine the types of foods that were being sold at the school tuck shops and by vendors. The focus

group members were also questioned on what control they had over what was being sold at the tuck shop and were also asked to suggest strategies to control what was being sold. The availability of budgets for oral health promotion and the type of support from Department of Health and Department of Education was also investigated. The members were asked to make suggestions on improvements for the programme and recommendations for the delivery of oral health promotion at the schools.

4.4 Ethical Issues

4.4.1 Ethical Approval

Prior to the commencement of the study, ethics approval was obtained from the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (HSS/0509/013D) (Appendix 12). A copy of the research proposal was submitted for their perusal and approval. The University of KwaZulu-Natal ethical guidelines was used to ensure confidentiality, consent to conduct interviews and data management.

4.4.2 Gatekeeper Permission

Gatekeeper permission was obtained from the Department of Health (REF: HRKM169/13) (Appendix 13) and Department of Education (REF: 2/4/8/468) (Appendix 14). The gatekeeper permission included an obligation concerning the dissemination of the results. Reports of the research findings will be sent to both departments. An attempt will be made to publish research findings in peer-reviewed journals.

4.4.3 Informed Consent

A copy of the information sheet outlining the purpose, aims and objectives of the study was submitted to all participants in addition to a copy of the signed consent form. The University of KwaZulu-Natal ethical guidelines was used to ensure confidentiality, consent to conduct interviews and the use of information for academic purposes. Participants had the right to withdraw from the study without any negative consequences.

4.4.4 Confidentiality

Informed consent was obtained from all participants in the study with the explicit right to confidentiality and respect for persons. Participants were fully informed of all the study procedures and written consent was obtained prior to the interview and oral health promotion programme. Transcripts were also sent to the interviewee for their approval before any direct quotations were

used. The nature of focus groups is such that confidentiality cannot be guaranteed. The participants were verbally informed at the start of the interviews that absolute confidentiality could not be guaranteed. The researcher provided participants with the procedures in place to maintain confidentiality of the research data and also informed participants not to repeat what is said in the focus group to others. Confidentiality for the interviews was maintained by not identifying the name of the interviewee. Codes were used to maintain anonymity. Data was only accessible to the supervisor and primary investigator. Permission to tape record interviews was obtained. The audiotapes of the interviews, questionnaires, data capturing sheet and DMFT assessment sheets will be kept safely in a locked cupboard at the University of KwaZulu-Natal for a period of five years. The audiotapes will then be burnt or broken and the questionnaires, data capture sheet and DMFT assessment sheets shredded.

4.5 Data Analysis

4.5.1 Quantitative Analysis

The checklist for the school environment data capture sheet, oral health screening form and questionnaire was analysed using the quantitative data analysis method. The content of the questionnaire and data analysis sheets were quantified according to codes, data entry and verification. The data that was collected from the quantitative responses was analysed with SPSS version 21.0. Inferential techniques used for data analysis included correlations and chi-square test values which were interpreted using p-values. Inferential statistics is the analysis of numerical data that tests the distinction between group means and the association between variables. It also determines whether or not these distinctions or associations are in fact different from zero (Teddlie and Tashakkori, 2009b). The chi-square test was performed to determine whether there was a statistically significant relationship between variables from the quantitative data obtained. Fisher's Exact Test was used to determine if there was a non-random association between two categorical variables.

4.5.2 Qualitative Analysis

The transcription obtained from interviews in Phase 1 and focus group discussions in Phase 3 were analysed separately. Responses from each interview and focus group discussion were first transcribed verbatim and organised according to the questions. The raw data was then checked and verified with the recordings for quality purposes. The researcher then read through the transcribed data for familiarisation (Dahlgren and Falksberg, 1991). Data was then analysed inductively. Data was first examined for broad categories that were related to the research questions. These categories were then

further refined and coded. Open, axial and selective coding was used. The data was firstly examined, named and then categorised into phenomena using open coding. Links were then formed between the categories and sub-categories. This is referred to as axial coding. Core categories were then created through selective coding (Strauss and Corbin, 1998). The conclusions drawn from the analysed data and the results were then presented in the final report of this study.

4.6 Validation of the Data

The two most important aspects of precision are reliability and validity which can be used for the validation of quantitative data (Shadish et al., 2002). Reliability is computed by taking several measurements on the same subjects. A reliability coefficient of 0.70 or higher is considered as "acceptable". All but two sections of the questionnaire in this study had a Cronbach's alpha score greater than the minimum required indicating a high degree of acceptable, consistent scoring for this research. Face validity which is a subjective assessment of the presentation and relevance of the questionnaire was used to test presentation and relevance. Questions asked were clear, relevant and unambiguous. The questionnaire was tested repeatedly in the population for which it is designed for validity. As a result of the study being conducted over a vast area and due to time constraints, field assistants were employed to conduct the dental examinations at some of the schools. The Pearson Chi-Square Test was used to check for intra examiner reliability. Results from this test exhibited no significant difference between examiners showing that examiner reliability was maintained.

Reliability in qualitative research can be considered as the trustworthiness of the procedures and data produced which is determined according to credibility and dependability (Stiles, 1993). Trustworthiness is the degree to which results from the study can be reproduced under different conditions (Bryman, 2001). This would entail confirming the results by revising data under different conditions. Inter-rater reliability, which requires the interview data to be sent to an independent researcher to verify findings and analysis, was used by the researcher to avoid researcher bias in the interpretation of the data (Weber, 1990). To add to reliability, detailed notes on decisions made throughout the study were kept in addition to ensuring technical accuracy in researching and transcribing. Furthermore, to increase reliability, intensive engagement with the data was maintained through forming firm links with our interpretations and data by using the verbatim responses of the participant's comments in our report writing (Roberts et al., 2006). Another approach to ensuring reliability in qualitative data, which was used in this study, was content analysis where codes were defined to describe data and were then confirmed by regularly returning to the coded data over time to check for stability (Roberts and Woods, 2000). The use of triangulation using different methodologies also ensured credibility.

Dependability was ensured by the publication of an article on "Viability in delivering oral health promotion activities within the Health Promoting School Initiative in KwaZulu-Natal" in the South African Journal of Child Health published in August 2015. A second article on "Dental caries status in six-year-old children in KwaZulu-Natal, South Africa" has also been accepted for publication by The South African Dental Journal. The third article on the "The promotion of oral health within the Health Promoting School in KwaZulu-Natal" is currently under review. The fourth article on a "Framework for the incorporation of oral health promotion within the Health Promoting School Initiative" is currently being prepared for review and should be published in 2016/7.

Transferability in qualitative research, which is analogous to external validity, entails the transferability of inferences from the research setting to other similar settings (Tashakkori and Teddlie, 2003b). This can be achieved by ensuring that data analysis and interpretation of rich sources of data are properly completed (Hull, 1997). Data in this study was obtained from outside stakeholders (provincial and district managers) as well as internal stakeholders (principals, educators).

Another criterion to ensure trustworthiness in qualitative research was confirmability which was the extent to which the data collected was verified. This entailed ensuring that the results were grounded in data, the inferences were logical and there was no bias present (Lincoln and Guba, 1985). For this study, interviewees were asked to verify the themes that emerged from the study. They were also asked to check the correctness of the results and conclusions. The researcher also tried to remain as objective as possible throughout the study.

4.7 Dissemination of Results

The findings of the study will be disseminated among relevant policy makers at district, provincial and national level of Health Promoting Schools and the Department of Health and Education in South Africa through policy briefs, oral presentations at key conferences and published journal articles in refereed journals both locally and internationally. A workshop will be conducted with the participating schools to give a report on the findings of the study.

This chapter examined the relationship between the theoretical framework, critical questions, research design, the creation of data and data integration techniques. Details of the three phases of the study are presented separately detailing study population, selection procedures, sampling techniques and tools utilised to collect data for each phase of the study. Data obtained from the mixed methods design used in this study was integrated and analysed. This provided the foundation for the reasoning, conclusions and recommendations made in this study. The next chapter presents the results and discussion of the study.

CHAPTER 5

RESULTS AND DISCUSSION

The manuscript format adopted in this thesis offers a coherent presentation of integrated results and discussions as obtained in the three phases of the study. The three phases of data collection included the following:

Phase 1: Comprised of an analysis of the current health and education policies, strategic plans, interviews with provincial and district managers (Appendix 1) involved with health promotion and the health promoting school, a questionnaire (Appendix 2) completed by selected school principals, a data capture sheet (Appendix 3) and a dental examination of selected six-year-old learners utilising the WHO DMFT Tool (Appendix 4).

Phase 2: Included the implementation of a programme based on the findings in phase 1, where twenty consenting schools successfully participated.

Phase 3: Involved the administration of a questionnaire (Appendix 5) to members of the school health team who constituted the focus group, in each school. Only thirteen of the twenty schools (from Phase 2) were involved in the third phase of the study.

In this chapter the qualitative and quantitative data obtained from Appendices 1, 2, 3, 4 and 5 are described and discussed in accordance to objectives 1, 2 and 5 of the study. The inextricable link between these objectives and the embeddedness of objective 5 is also demonstrated appropriately throughout the analysis. The objectives are included below for ease of reference:

1. To identify current policies or priorities for health promotion and oral health promotion in policies, strategic plans and annual reports of the Department of Health and Department of Education.
2. To conduct a situational analysis of existing services and an epidemiological profile to determine unmet oral health needs of six year old learners at the selected Health Promoting Schools in KwaZulu-Natal using a questionnaire, interview schedule, data capture sheet and the WHO DMFT Tool.
3. To determine the presence or absence of school based oral health promotion programmes at the selected schools using a questionnaire and interview schedule.

4. To introduce oral health promotion programmes in schools where there are no or interrupted oral health service delivery to determine the feasibility of these programmes.
5. To determine the opportunities and barriers for the incorporation of oral health promotion within the Health Promoting School Initiative through focus group discussions.
6. To compare the findings in this programme to that of schools with existing oral health promotion programmes.

The coding to identify participant responses in the three phases of the study for the provincial and district managers and schools is presented in Table 5.1 and Table 5.2 respectively. Open coding, axial coding and selective coding was utilized to analyse the data (Strauss and Corbin, 1998).

Table 5.1: Codes for Provincial and District Managers

MANAGER		CODE
Provincial	Department of Education (DOE)	A
	Department of Health (DOH)	B1
		B2
District	eThekweni	C
	Uthukela	D
	Ugu	E
	iLembe	F

Table 5.2: Codes for Schools

DISTRICT	SCHOOL	CODE
Amajuba	Cebelihle Primary	1
Amajuba	Clavis Primary	2
eThekweni	Greenbury Primary	3
eThekweni	Zakhele Primary	4
Sisonke	Ixopo Primary	5
Sisonke	Mazongo Primary	6
Ugu	Mdlazi Primary	7
Ugu	Port Shepstone Junior Primary	8
Ugu	Port Shepstone Primary	9
Umgungundlovu	Fairleigh Primary	10
Umgungundlovu	TPA Primary	11
Umkhanyakude	Echwebeni Primary	12
Umkhanyakude	Ezimbidleni Primary	13
Umzinyati	Endumeni Primary	14
Umzinyati	Mashesheleng Primary	15
Uthukela	M L Sultan Colenso P	16
Uthukela	M L Sultan Ladysmith P	17
Uthungulu	Bay Primary	18
Uthungulu	Phalane Primary	19
Zululand	Thengisangaye Primary	20
Zululand	Velankosi Primary	21
iLembe	Nokubusa Primary	22
iLembe	Nophungwa Primary	23

Four salient themes emanated from the data. These included curriculum and policy, awareness, services and support. These themes were subsequently aligned to objectives 1, 2 and 5 of the study. The data is presented in Table 5.3 as categories that are linked into a framework of consistent behaviour, connections and consequences that are relevant to a particular phenomenon as noted by Strauss and Corbin (1998). The data will be presented as direct narratives from the participants of the study and are italicized and indented.

TABLE 5.3: The properties and dimensions of the categories

CATEGORY	PROPERTY	DIMENSIONALISATION
5.1 Policy and priorities	Policy	
	Priorities	
5.2 Situational Analysis	5.2.1 Oral health needs	
	5.2.2 School Services	
	5.2.3 Oral Health Services	
	5.2.4 School Health Services	
	5.2.5 Tuck shop and Vendors	5.2.5.1 Challenges 5.2.5.2 Strategies
	5.2.6 Curriculum	
	5.2.7 Training	5.2.7.1 Challenges Time constraints 5.2.7.2 Barrier - Workloads
	5.2.8 Awareness	5.2.8.1 Lack of awareness 5.2.8.2 Creation of awareness 5.2.8.3 Manual brushing technique and frequency 5.2.8.4 Community awareness
	5.2.9 Community support and collaboration	
5.3 Opportunities and Barriers	5.3.1 Support for interventions	Department of health and education Funding School health services • Lack of oral health • Lack of knowledge • Workloads • Oral health personnel Staff training Parents
	5.3.2 Resources	Water and sanitation Toothbrushes and toothpaste • Lack of toothbrushes and toothpaste • Storage • Neglect of Learners brushing at home Benefits

SOURCE: Adapted from Strauss and Corbin, 1998

5.1 Policies and Priorities

The first category was associated to Objective 1 of the study. Policies and strategic plans were reviewed for the identification of statements related to health and oral health promotion and their priorities. Responses on the availability of an oral health policy were elicited from school principals and managers (Appendices 1 and 2).

The following table (Table 5.4) represents the list of policies and guidelines that were reviewed.

Table 5.4: Policy/Strategy/ Report/Guidelines and Priorities

Documents	Priorities
National	
1. South African National Oral Health Strategy (2004) 2. National Oral Health Strategy (Draft:2010)	*Interventions* Primary prevention & promotion, integrated approach, common risk factors *Resources required* Oral health personnel, physical facilities, funding & transport
3. Policy guidelines for Youth and Adolescent Health (2001)	*Interventions* Primary prevention & promotion, integrated approach & common risk factor School health services
4. School Health Policy and Implementation Guidelines (2011)	*Interventions* Primary prevention & promotion, integrated approach & common risk factors School screenings for oral health *Resources required* Nursing personnel for school health services
5. Integrated School Health Policy (2012)	*Interventions* Primary prevention & promotion, integrated approach & common risk factors School health services Screenings for oral health
Provincial	
6.KwaZulu-Natal Department of Health Strategic Plan 2010-2014 (2010)	*Interventions* Primary prevention & promotion, integrated approach & common risk factors *Resources required* Human resources, funding, staff accommodation
7.KwaZulu-Natal Department of Health – Vote 7 Annual Report 2011/12 (2012)	*Interventions* School-based preventive and promotive oral health programme *Resources required* Oral health personnel, facilities and equipment

Patel (2005) maintains that since 1994 policies have been formulated to address the constitutional imperatives (Patel, 2005). The South African National Oral Health Strategy (2004) and draft National Oral Health Strategy (2010) prioritised the improvement of oral health for all citizens and provided

details on oral health and oral health promotion nationally, provincially and at district level (Department of Health, 2004, Department of Health, 2010c). The South African National Oral Health Strategy (2004:1-5) and the National Oral Health Strategy (2010: 9-10) focused on water fluoridation; alternate fluoridation; research; national norms and standards for oral health service delivery; integration of oral health into other health programmes such as HIV/AIDS, Maternal and Women's Health, Child and Adolescent Health, Nutrition, Chronic Diseases, Disabilities and Geriatrics; collaborative approaches that address common risk factors such as tobacco, sugar and alcohol; raising awareness of oral disease risk factors and oral self-care and evaluation of district oral health services (Department of Health, 2010c, Department of Health, 2004). There was no specific mention of school programmes in the South African National Oral Health Strategy (2004) however reference was made to the Primary Health Care Package for South Africa which upon further investigation proposed that 50% of primary schools have organised school preventive programmes (Department of Health, 2004). However, this was not reflected in my study of identified schools in KwaZulu-Natal as noted in Section 5.2.3:97. This indicates that this strategy has not translated into practice since 2004 and oral health services have not been properly aligned. In addition, there is no evidence of water fluoridation, integration of oral health into other health programmes and collaborative approaches that address common risk factors in current literature.

Seemingly, the scope of the draft National Oral Health Strategy (2010: 5-7) is applicable to all oral health care institutions both privately and publicly to provide a framework for provinces and districts to develop plans that address these communities at a local level focusing on primary, secondary and tertiary care, prevention and promotion, reduction of untreated disease, population oriented interventions based on evidence and the integration of oral health into all health policies. Recruitment and training of nurses, teachers and community health workers would also be required for oral health promotion. Document analysis of the draft National Oral Health Strategy (2010) further identified the school environment as a viable platform to address health and oral health related needs (Department of Health, 2010c). However, cognizance should be made that this is a draft policy awaiting finalisation of the National Health Insurance White Paper and therefore has to still be implemented (personal communication with National Department of Health).

The annual report of KwaZulu-Natal Department of Health (2011/12) outlined a strategy for oral and dental health services. This was presented in the form of an Oral Health 10 Point Plan 2011-2015 which prioritised the establishment of comprehensive preventive and promotive programmes at schools which would include integrated school-based tooth brushing programmes, fissure sealant programmes and integrated screening and education programmes. The establishment of regional orthodontic services for children was also included in the plan (Department of Health - KwaZulu-Natal, 2012). However, current shortages of oral health personnel and resources in the public sector

compromised the timeous implementation of these programmes (Thema and Singh, 2013, Department of Health, 2010b). This was further validated in this study by a provincial manager and school participant as illustrated in the following responses:

> *The oral hygienist and dental assistant used to come to the school and assess the teeth of learners and teach them how to keep their teeth healthy (2).*
> *A barrier identified in the introduction of oral health promotion at schools is the absence of dental therapists and oral hygienists (B2).*

The two related learner policies, namely The Youth and Adolescent Policy (2001) and Integrated School Health Policy (2012), identified the need to improve and strengthen existing school health services which is an integral part of health promotion and prevention (Department of Health and Basic Education, 2012, Department of Health, 2001). Although the Integrated School Health Policy was produced more than ten years after the Youth and Adolescent Policy, similar problems persist, such as inadequate coverage of oral health services in schools and the need to integrate oral health services into all levels of health care delivery. The lack of adequate coverage of oral health services at schools was also established in this study as illustrated in Section 5.2.3:97. In addition the preceding analysis authenticates conclusions made by Singh (2011) that policies were not being translated into practice (Singh, 2011). More research needs to be conducted to investigate the reasons for the lack of oral health promotion integration into other health programs and the lack of translation of policy into practice.

School screenings for oral health were mentioned in the School Health Policy and Implementation Guidelines (2011:25) and Integrated School Health Policy (2012:13) however, there was no specific reference to oral health promotion in these policy statements (Department of Health and Basic Education, 2012, Department of Health, 2011b). A possible reason for this absence could be that the Integrated School Health Policy was only informed by the South African National Oral Health Strategy (2004) and not the latest draft National Oral Health Strategy (2010). Many of the challenges, such as staff shortages and infrequent visits to the schools by the school health nurses that were identified in these documents continue to exist presently as identified in the following responses in this study by the managers from the Department of Health:

> *Because of the workload the school health nurses cannot cover all the schools (B2).*
> *We don't have the capacity – the school health team has to support large areas. It is difficult for them to re-visit school. Follow-up with health promoting schools is scanty. We don't have the capacity. The province is trying to help these teams by employing new teams. We are doing our best (B1).*

Additionally a lack of adequate resources, referral systems and transport, poor roads and infrastructure impacted on service delivery (Department of Health and Basic Education, 2012, Department of Health, 2011b).

The Department of Health Strategic Plan 2010-2014 reported that the major challenge faced for the sustainability of the Health Promoting Schools was poor support from the Department of Education (Department of Health, 2010b). This lack of collaboration was confirmed in this study by the response from the provincial manager of the Department of Health:

> *There needs to be collaboration between the Department of Education and Department of Health. Health promotion is second on the list of priorities in the Integrated School Health Policy but the Department of Education may look at it differently. We cannot separate education and health promotion. A partnership needs to be formed (B2).*

The high vacancy rate of oral hygienists which was also reported in the Strategic Plan (2010) impacted on the effectiveness and sustainability of oral health education and school screening services (Department of Health, 2010b). Evidence of this was also noted in the present study as exemplified in the following responses:

> *There are a shortage of oral hygienists and dental therapists. The school health nurses are trying to do their best in their absence but they lack the knowledge (B2).*
> *Number one barrier is the absence of oral hygienists to provide preventive services to the 6-year-olds (F).*

In response to question 1 of this study the above narrative indicates that oral health service delivery at schools is not prioritised since it is currently dependent upon the school health nurses. These nurses have high workloads and lack adequate knowledge on oral health promotion.

Moreover, provincial and district managers were questioned on the presence of health and oral health policies. Their responses varied. Positive responses were provided by two district managers as illustrated below:

> *Health Promoting Schools have health policies to address some common health ills in the schools. Most health promoting schools have a tooth brushing programme from grade R/1 up to grade 3 and policies of when and how to brush their teeth. The schools on School Feeding Scheme educate the learners on tooth brushing after meals. They are also expected to have a*

healthy eating policy and follow this through by having healthy food and drinks. Some schools however have very little or no water in the school premises (D).
I have 23 accredited health promoting schools. All have oral health policies. A healthy eating policy is also included (E).

Although the above responses were positive, study findings during the researchers visit indicated a lack of evidence of implemented oral health policies at the district schools.
This was validated by the response from the provincial manager from the Department of Education who indicated that there was no oral health policy in place but there were guidelines provided for a Healthy School Policy:

We do not have an oral health policy as yet. There are guidelines provided for healthy school policy via the school nutrition programme and the support to School Governing Bodies in respect to vendors (A).

The provincial managers from the Department of Health were not specific in their response about whether there were oral health policies in place as demonstrated in the responses below:

Health promoting schools have lots of policies – they work out their own. As much as oral health is encouraged – they need to work on policies. Schools draw up their own policies (B2)
School has a one pager – talks to what you should do – don't want them to develop books – they just need a guide document (B1).

In addition one of the district managers was uncertain of whether the schools in her district had oral health policies as indicated in the following responses:

Off- hand I can't tell you. One of the things we look at – for example I was at a school in iLembe yesterday. They might have a policy especially if they are having a tooth brushing programme they will have like a two line policy that you brush your teeth at least twice a day. There is nothing rigid or cast in stone as department of education. But our school health team always encourage the children and they always examine them. Need a healthy eating policy (C).

As established from the provincial and district managers responses above, there were inconsistencies in their interpretation of the presence of policies. The provincial manager from the Department of Education was certain that there were no oral health policies in place at the schools while the provincial manager from the Department of Health was not specific. Responses also varied between

district managers with some managers being positive about the presence of policies while others were unsure. This demonstrates that managers were not familiar with what was in place at the schools indicating a lack of coordination and harmonization between the Department of Health and Department of Education in terms of policies and guidelines.

Similarly, principals indicated that only five schools (21.8%) had comprehensive oral health policies in place. However, on the researchers visit to these five schools only one provided supporting evidence of an oral health policy. This therefore indicates, as noted also by district managers B1, B2 and C in Section 5.1:83 that there is a lack of awareness by managers in strategic posts on specific policies that are existent at their schools.

A district manager supported the need for an oral health promotion policy to be developed to ensure the implementation of an oral health promotion programme as demonstrated below:

> *I think the development and implementation of an oral health promotion policy influences whether health promoting schools engage with oral health promotion or not. Schools are expected to have a number of policies including healthy eating, physical activity, no tobacco smoking, vendors and other policies but there is still no control of what is sold by outside vendors. We have not specified about sugar free foods and drinks but encouraged drinking lots of water at least 8 glasses a day (F).*

The above was further supported by all (100%) participants in the focus group interviews at schools who overwhelming asserted that oral health promotion should be included in the health policy of the school for the successful implementation and sustainability of an oral health promotion programme. Furthermore, beyond school it would also assist in ensuring the promotion of parental co-operation.

However, one participant from the Health Promoting School declared that there were many activities that required policies and it was therefore demanding not only to keep track of all the policies, but their implementation as accounted in the following response:

> *Learners are on an on-going basis, participating in activities planned. However it is difficult to keep track of all the policies to be implemented (11).*

From the narratives above, Department of Health and Department of Education should consider a comprehensive policy that provides guidelines on all activities that should be included in a health and oral health policy. Schools could thereafter adapt accordingly, as it has been emphasized that school management do not have the time to implement many policies. This is further validated by the

responses from the schools visited in the third phase of the study. Further in the second phase of the study, schools were provided with guidelines and requested to draw up an oral health policy based on the needs of their schools. However, only two schools complied with this request. Petersen and Kwan (2010) argued that evidence from countries worldwide have shown that although community outreach primary health care is vital to the improvement of oral health, one of the major barriers affecting the implementation of integrated health promotion is a lack of health policy (Petersen and Kwan, 2010:130). Likewise, Petersen (2009) contends that evidence on how social determinants impact on oral health is not sufficiently incorporated in the public policies of developing countries (Petersen, 2009:116).

In addition to the review of policies in the first phase of the study it was imperative to gather pertinent information from a range of sources to establish what currently existed in the selected schools.

The second category, related to the second objective of the study, involved conducting a situational analysis. The properties that emerged from this category was oral health needs, school services, oral health services, school health services, tuck shop and vendors, curriculum, training, awareness and community support and collaboration.

5.2 Situational Analysis

The purpose of the situational analysis in this study was to determine the unmet oral health needs of the Grade 1 learners prior to the implementation of the oral health promotion programme; assess what facilities and services were currently available at the selected schools in KwaZulu-Natal; what was in existence in terms of oral health promotion and whether there was awareness created with the Health Promoting School Initiative.

The province of KwaZulu-Natal consists of urban, peri-urban and rural areas. A peri-urban area is classified as an area immediately around an urban area and a rural area is found outside the cities and towns. The majority (60.9%; n=14) of schools in the study sample (n=23) were located in rural areas, 26.1% (n=6) in peri-urban areas and 13% (n=3) in urban areas.

An aspect of the situational analysis was to determine the unmet oral health needs of the learners in Grade 1 at the selected schools in this study. The following section reports on the results obtained in the first phase of the study from the WHO DMFT Tool (1994) (Appendix 4) together with an interpretation of these findings.

5.2.1 Oral health needs

Of the total sample (345) of Grade 1 learners the examined ratio of males to females was approximately 1:1 (51.6%:48.4%). The mean age of the participants was 6.8 with 96.7% falling into the six to eight year age group.

The Pearson Chi-Square Test exhibited no significant difference in the results for intra examiner reliability showing that examiner reliability was maintained.

Of the total sample (345) of learners, 37.7% (130) male learners presented with caries compared to 33.0% (114) female learners. The Fischer's Exact Test p-value (0.196) which was greater than the level of significance implied that there was no significant relationship between gender and the number of decayed teeth. The prevalence of caries in the rural and urban black learners also showed no significant difference. The caries experiences of primary teeth of six-year-olds are shown in Table 5.5.

TABLE 5.5: Caries experience of primary teeth of 6-year-olds in KwaZulu-Natal

	Primary
Mean no. of primary teeth per person	14.98
No. and percentage of subjects with caries	253 (73%)
Mean number of decayed primary teeth per person	3.13
No. of missing primary teeth	175
Percentage of missing primary teeth per person	2.54%
No. of filled primary teeth	8
Percentage of filled primary teeth from total number of teeth examined (n=7617)	0.11%

The mean number of primary teeth and the mean number of decayed primary teeth per person was 14.98 and 3.13 respectively. The percentage of subjects with caries in the primary dentition was 73%. Only 0.11% of total number of primary teeth examined was filled and the percentage of missing primary teeth per person was 2.54%.

Table 5.6 demonstrates a distribution of the components of dmft with a low missing (0.5) and filled (0.02) component and a mean dmft of 3.65.

TABLE 5.6: Distribution of the mean dmft and the components of dmft for the 6-year-old age group

Dmft	**D**	**m**	**f**
3.65	3.13	0.5	0.02

The severity of dental caries expressed as the mean dmft for schools and percentage dmft per child and district in KwaZulu-Natal are shown in Table 5.7.

TABLE 5.7: dmft per school and percentage dmft per child and district in KwaZulu-Natal

District	**School**	***Rural/Peri-urban/urban R/PU/U**	**Average dmft District/School**	**% dmft per child**	**% dmft per District**
Amajuba			5.7		18
	Cebelihle P	R	6.8	21	
	Clavis P	R	4.7	15	
eThekweni			4.6		14
	Greenbury P	PU	4.7	15	
	Zakhele P	PU	4.4	14	
Sisonke			4.0		13
	Ixopo P	R	4.1	13	
	Mazongo P	R	3.9	12	
Ugu			3.2		10
	Mdlazi P	R	2.8	9	
	Port Shepstone P	PU	4.0	13	
	Port Shepstone JP	PU	2.9	9	
Umgungundlovu			4.4		14
	Fairleigh P	R	3.9	12	
	TPA P	U	4.9	15	
Umkhanyakude			1.9		6
	Echwebeni P	R	2.6	8	
	Ezimbidleni P	R	1.2	4	
Umzinyati			2.9		9
	Endumeni P	PU	4.7	15	
	Mashesheleng P	R	1.1	4	
Uthukela			4.3		14
	MLS Colenso P	PU	4.3	13	
	MLS Ladysmith P	U	4.4	14	
Uthungulu			2.7		8
	Bay P	PU	3.3	10	
	Phalane P	R	2.1	6	
Zululand			3.1		10
	Thengisangaye P	R	3.5	11	
	Velankosi P	R	2.7	8	
iLembe			3.4		11
	Nokubusa P	R	3.5	11	
	Nophungwa P	R	3.4	11	

*A peri-urban area is classified as an area immediately around an urban area and a rural area is found outside the cities and towns.

The mean dmft scores for the districts ranged from a low of 1.9 (Umkhanyakude) to a high of 5.7 (Amajuba). The d component of the dmft made up more than 85% of the total mean. The mean range dmft for schools was 1.1 (Umzinyati) to 6.8 (Amajuba) which, are both rural areas.

The percentage dmft per child ranged from a low of 4 (Umzinyati and Umkhanyakude) to a high of 21 (Amajuba). This translated to 96% of the children having a dmft of 0 in the Umzinyati and Umkhanyakude districts. These were all rural areas. The percentage dmft per district ranged from a low of 6 (Umzinyati and Umkhanyakude) to a high of 18 (Amajuba). This meant that 94% of the children were caries free in the Umzinyati and Umkhanyakude districts.

Of the total sample of participants only 8 teeth had fillings present with seven from Bay Primary in the Uthungulu district. The 7 fillings were present in one child. Missing teeth were only recorded if they were due to caries. There were a higher number of posterior lower teeth missing due to caries compared to upper teeth.

The above evidence indicated that only one district (Umkhanyakude) from the eleven districts had a low (1.9) dmft score (Table 5.7) representing that dental caries has not been adequately addressed and that there was a need for an improvement of oral health services in these districts in KwaZulu-Natal. When further analysed there was an increase in the d and m components and a decrease in the f component of the dmft with the latter indicating a possible decrease in oral health service provision for restorative procedures. Singh et al. (2010:21) also stated that in KwaZulu-Natal the focus is currently on curative (extractions) rather than preventive services with priority not given to oral health in budget allocations (Singh et al., 2010). With the increase in decayed and missing teeth it becomes vital that children, parents and caregivers are targeted for preventive services, so that the carious process and how to implement simple procedures for its prevention are understood.

Analysis from this study further identified that participants in rural areas had both high and low percentages of caries when compared to the urban and peri-urban areas. There was also a wide difference in the mean dmft per school and the percentage dmft per child and per district for primary teeth. Although schools from the urban areas had high dmft scores (4.4; 4.9), they were not as high as some of the rural (5.7) areas (Table 5.7). These results differed to studies conducted in other provinces in South Africa were rural scores were only lower than urban and peri-urban areas (Bajomo et al., 2004, Cleaton-Jones et al., 1984). A study conducted in Portugal disclosed the opposite, with caries scores significantly higher in rural areas (de Almeida et al., 2003). The higher scores in the rural areas could be due to incorrect diet, source of water and fluoride content, lack of knowledge on oral health education, poor access to oral health care, and affordability of fluoridated toothpaste (van Wyk and van Wyk, 2004). Further investigations would need to be conducted to establish contributing risk factors for caries in rural areas.

Results in this study further indicated that primary teeth in the rural and urban areas had no restorations but there was evidence of a minimal amount of restorations in the peri-urban areas with

the majority from a school in the Uthungulu district. Similar results were obtained in a study in Venda (Bajomo et al., 2004). Evidence on treatment noted in this study confirmed that there was very little done for curative services with only learners from one school having minimal restorations present on primary teeth. This potentially could be as a result of a scarcity of oral health personnel, limited resources, lack of accessibility to facilities and affordability. Priority therefore needs to be afforded to six-year-olds for curative and preventive services.

The number of carious primary teeth by school and district in KwaZulu-Natal are shown in Table 5.8.

TABLE 5.8: The number of carious primary teeth by school and district

District	School	Caries	% Caries/School	% Caries/District
Amajuba	Cebelihle P	101	33.7	27.5
	Clavis P	64	21.3	
eTthekweni	Greenbury P	54	18	19.3
	Zakhele P	62	20.7	
Sisonke	Ixopo P	52	17.3	17.8
	Mazongo P	55	18.3	
Umgungundlovu	Fairleigh P	45	15	17.3
	TPA P	59	19.7	
iLembe	Nokubusa P	52	17.3	17.2
	Nophungwa P	51	17	
Uthukela	MLS Colenso P	42	14	14.7
	MLS Ladysmith P	46	15.3	
Zululand	Thengisangaye P	43	14.3	13.5
	Velankosi P	38	12.7	
Umzinyati	Endumeni P	61	20.3	12.8
	Mashesheleng P	16	5.3	
Ugu	Mdlazi P	36	12	12.3
	Port Shepstone P	51	17	
	Port Shepstone JP	24	8	
Uthungulu	Bay P	40	13.3	12
	Phalane P	32	10.7	
Umkhanyakude	Echwebeni P	34	11.3	8.7
	Ezimbidleni P	18	6	

The percentage of decayed teeth varied widely for schools and districts with scores of 6 to 33.7 and 8.7 to 27.5 respectively. Umkhanyakude district which had the lowest scores and Amajuba the highest were both rural areas. On further investigation it was noted that School 1 from the Amajuba district had the highest percentage of caries per school therefore resulting in a high score for this district. This school had no support from school health services, no oral health services in place and no community support and collaboration.

The number of carious upper and lower anterior (incisors and canines) and posterior (first and second molars) primary teeth are illustrated in Table 5.9.

TABLE 5.9: Number of carious upper and lower anterior and posterior primary teeth

Type of tooth	Number of carious teeth
Upper first and second molars	331
Upper incisors and canines	198
Lower first and second molars	508
Lower incisors and canines	34

The lower molar teeth had higher amounts of caries present compared to the upper molars. The findings for the anterior teeth were the opposite with a higher number of caries present in the upper teeth. The higher scores were found predominantly in the rural areas.

Table 5.10 displays the treatment needs of learners.

TABLE 5.10: Treatment needs of learners

No. and percentage of participants requiring preventive/caries arresting care	311 (90%)
No. and percentage of participants requiring surface fillings	120 (35%)
No. and percentage of participants requiring extractions	17 (5%)
No. and percentage of children needing treatment	324 (94%)
No. and percentage of secondary teeth requiring fissure sealants	1130 (16.4%)
No. and percentage of teeth (primary and secondary) requiring fillings	320 (4.6%)
No. and percentage of teeth (primary and secondary) requiring extractions	38 (0.5%)
Mean no. of teeth/child requiring treatment	4.3

From the total sample (n=345), 94% (324) of the learners required some form of treatment. Ninety percent (90%) of the learner's required preventive care, 35% surface fillings and 5% extractions. Learners at Sisonke, eThekweni and Ugu districts required more fillings compared to learners in the Umgungundlovu and iLembe districts.

The mean number of teeth requiring treatment per child was 4.3. Fissure sealants were required by 16.4% of the secondary teeth examined; 4.6% and 0.5% teeth (primary and secondary) required fillings and extractions respectively. As illustrated above the percentage of learners requiring treatment was very high (94%) (Table 5.10). The most common care needed was preventive services (fissure sealants). There was a greater requirement for preventive and restorative services than

extractions. This possibly could be as a result of the criteria that were used where teeth that were decayed with no pain and could not be restored were not specified for extraction. Reasons for these high scores could be due to affordability and a lack of availability and accessibility to oral health services, especially in rural areas. The type of services required varied between districts. All districts required preventive services. The majority of restorations required came from the Sisonke, eThekweni and Ugu districts. For these services to be provided relevant oral health personnel, equipment and materials would have to be accessible. These findings provide further evidence that the Oral Health 10 Point Plan (DOH-KZN, 2012) as discussed in Section 5.1:80 has not been translated into practice.

The results in this study further indicated that only 27% (Table 5.5) of the six-year-old age group in KwaZulu-Natal are caries free and that more than 90% of caries goes untreated. If the criteria for the new National Health Goals for 2020, which states that 60% of 6-year-olds must be caries free and have fissure sealants placed on their first molars in Grade 1 are to be met in KwaZulu-Natal, oral health services would need to be drastically improved to meet these goals (Department of Health, 2010a). In order for this to occur, School Health Services would need to prioritise oral health services by employing oral health personnel such as oral hygienists and dental therapists to meet these needs. In addition the focus of services provided at clinics should include restorative care for the treatment of caries. However this is not prioritised due to a lack of resources and funding at clinics (Department of Health, 2010b). Moreover, the population are probably not aware of the curative treatment that could be performed.

Results from a previous study conducted in Hlabisa in 2002 were also compared to results from the Umkhanyakude district in this study, to which Hlabisa belongs (Brindle et al., 2000). The dmft for the Umkhanyakude district was 6 (Table 5.7) in this study, which was higher than the score for Hlabisa (3). The increase in dmft could be as a result of an increase in sugar consumption since 2000 (Ismail, 1998). There was a slight difference in the number of fissure sealants required per learner in both studies but there was a huge difference in the number of learners requiring restorations. In the present study only 8 learners required restorations compared to 95 in the Hlabisa study. This huge difference could be attributed to the criteria used for caries diagnosis in the deciduous teeth as this was a high score in the Hlabisa study.

The results from the present study were compared to the KwaZulu-Natal results from the two National Oral Surveys conducted in South Africa as shown in Table 5.11.

TABLE 5.11: Comparison between NOHS 1988, 1999-2002 and current study of prevalence of dental caries and untreated caries in 6-year-olds in KwaZulu-Natal

	% caries KZN	% untreated caries KZN	% children need care KZN	dmft Durban	d (Durban)	f (Durban)
1988				3.89	3.58	0.15
1999 – 2002	64.8	59.9	62.3	3.42	2.79	0.15
2013	73	71	93.9	4.55	3.1	0

Source: Department of Health (1988/89) National Oral Health Survey South Africa
Department of Health (2003). Report: National Children's Oral Health Survey: 1999-2002:9

Results from the present study provide evidence of an increase in prevalence of caries for six-year-olds in KwaZulu-Natal as compared to the results obtained in the last National Oral Health Survey (2003) (Table 5.11). The Unmet Treatment Need Index (Jong, 1981) was used to calculate the amount of oral health services that need to be provided for treatment of caries in the six-year-old age group. The Unmet Treatment Need was 97% which translates to more than 90% of all caries that is untreated in the 11 districts in KwaZulu-Natal.

Comparison of the results obtained in the Durban area to the National Oral Health Surveys (Table 5.11) exhibited an increase in the decayed component and a decrease in the f component. The increase in the d component could be as a result of a change in diet in this area. The decrease in f component could be as a result of only extractions being offered at primary health care centres (Singh et al., 2010).

The current data according to Ayo-Yusuf et al (2007) may not be a good indicator of the impact of caries in South Africa (Ayo-Yusuf et al., 2007). A limited number of epidemiological studies have been conducted in KwaZulu-Natal, especially in the rural areas (Petersen, 2003). This has resulted in limited information on dental caries status being available to inform planned oral health interventions that is based on the needs of the population. There have been insufficient or no studies conducted in areas such as etiological factors, parental education and social factors that include various population groups and social classes (Department of Health, 2010b, Ayo-Yusuf et al., 2007, Gordon and Reddy, 1985, Cleaton-Jones et al., 1994, Cleaton-Jones et al., 1983). Similar findings have been found in studies conducted in Africa where various diagnostic methods were used and age groups varied (Cleaton- Jones and Fatti, 1999). Of significance in dental caries epidemiological studies is the methods used for population sampling (Cleaton-Jones et al., 1983). South Africa has a diverse population with differing levels of socio-economic status populating and living in different geographic locations, namely urban, peri-urban and rural areas. More than half of the population of KwaZulu-Natal live in rural areas. Six districts, (Uthukela, Ugu, Sisonke, Zululand, Umkhanyakude,

Umzinyati), of the eleven in KwaZulu-Natal form part of the ten most deprived in South Africa. Moreover, shortages in human resources is highest in the rural areas and transport costs are higher for the rural poor (Rural Health Advocacy Project, 2013). It is therefore imperative that consideration be given to geographic distribution and methods used for population sampling prior to the planning of intervention strategies for dental caries (Lalloo et al., 1999). This would inform policy planning and service delivery so that policies are tailored to meet the oral health needs of the various communities especially at district level (Jurgensen et al., 2012, Department of Health, 2010b, Cleaton-Jones et al., 1994).

The present study therefore included the eleven districts of KwaZulu-Natal to establish the oral health needs of six-year-olds to ensure that programmes implemented would be informed by the recommendations offered and that the data could be cited as a baseline and motivation for further such studies. A limitation in this study was that the permanent teeth were only present for a short period of time in the age group examined and were therefore not exposed to caries risk factors for long.

This study has revealed high caries prevalence in the six-year-old age group in KwaZulu-Natal highlighting the need for a change in our approach to the control of this disease. Taking into consideration the difference in availability to oral health services in the various districts and that it will take a long time for this issue to be addressed due to limited funding, the school setting could provide a more affordable platform for oral health promotion programmes that would be based on the needs of the community at a local level. Data provided in this study has appraised what is currently in place in KwaZulu-Natal and can be used for future planning of preventive programmes targeting primary school children.

Another concomitant feature of the situational analysis was to determine the types of services that were available to the schools. Results that were obtained from the situational analysis in the first phase of the study are integrated with the results obtained from the focus group discussions in the third phase of the study. These results were grouped into themes and are reported in the subsequent sections.

Some of the objectives of the situational analysis in this study were to assess what facilities and services were currently available at the selected schools in KwaZulu-Natal; what was in existence in terms of oral health promotion; and whether there was awareness created with the Health Promoting School Initiative.

5.2.2 School Services

The effective execution of oral health promotion programmes required investigation into the types of school services available at the selected schools. An assessment of the services available at the schools is outlined in Table 5.12 below.

Table 5.12: Services provided at Rural and Urban/Peri-Urban Schools

	RURAL (n=14)		URBAN/PERI-URBAN (n=9)		SIGNIFICANCE
	Poor	Good	Poor	Good	
1. Sanitation or toilet condition or number	50%	50%	22.2%	77.8%	p=0.677
2. Water supply and safety	35.7%	64.3%	0%	100%	p=0.043
3. Refuse disposal: type/bins	50%	50%	11%	89%	p=0.148
4. Recycling programme in place	78.6%	21.4%	44.4%	55.6%	p=0.005

Fifty per cent (50%) of the participants in the rural areas reported that sanitation and the condition or number of toilets was adequate and seven participants (77.8%) in the urban, peri-urban areas were satisfied with sanitation and availability of toilets. The absence of proper sanitation in the rural areas was further verified by Co-Operative Governance and Traditional Affairs with KwaZulu-Natal having a backlog in sanitation of 32.3% and Sisonke district reporting more than 50% of its households without an acceptable level of access to sanitation (Department of Co-Operative Governance and Traditional Affairs Province of KwaZulu-Natal, 2013).

Water supply and safety in the urban and peri-urban areas was reported as good (100%) compared to rural water supply and safety (64.3%). Rural schools in the Sisonke, Umkhanyakude and Umzinyathi districts described water supply as poor which was further validated by statistics obtained from Co-Operative Governance and Traditional Affairs which conveyed that these districts had more than 45% of their households without an acceptable level of access to water (Department of Co-Operative Governance and Traditional Affairs Province of KwaZulu-Natal, 2013). Poor water supply at rural schools was also described by district manager D from the Uthukela district in Section 5.1:83. Participants (78.6%) in the rural areas and 44.4% in the urban / peri-urban areas further conveyed that recycling was inadequate.

Community support services that were available within a 30 kilometre radius at the rural schools are presented in Table 5.13.

Table 5.13: Community Amenities close to rural schools

COMMUNITY AMENITIES	YES	NO
Hospital	57.1%	42.9%
Clinic	71.4%	28.6%
Police Station	57.1%	42.9%
Recreational Facilities	28.6%	71.4%

Responses from participants at the schools located in the rural areas (n=14) specified that 71.4% had clinics located within a 30km radius. Only 57.1% of these schools indicated that hospitals and police stations were located within a 30km radius. Recreational facilities such as sporting activities were not easily accessible to 71.4% of the rural schools. Evidently from site visits to these schools, road conditions were poor and transport and resources limited which impacted negatively on accessibility. This challenge was further endorsed in the School Health Policy and Implementation Guidelines 2011 as reported in Section 5.1:82.

Another concomitant component investigated was types of oral health services that existed at the selected schools.

5.2.3 Oral Health Services

The availability of oral health services at schools cannot be overstated (Petersen, 2004b). Of the total sample (n=23) of schools, 72.7% of participants indicated that there were oral health services in place. Activities citied varied between visits from dentists, oral hygienists and school health nurses, class lessons to a small extent, provision of toothbrushes and toothpaste, screening, tooth brushing programmes and oral health awareness days. Oral health services offered at the schools is illustrated in Figure 5.1.

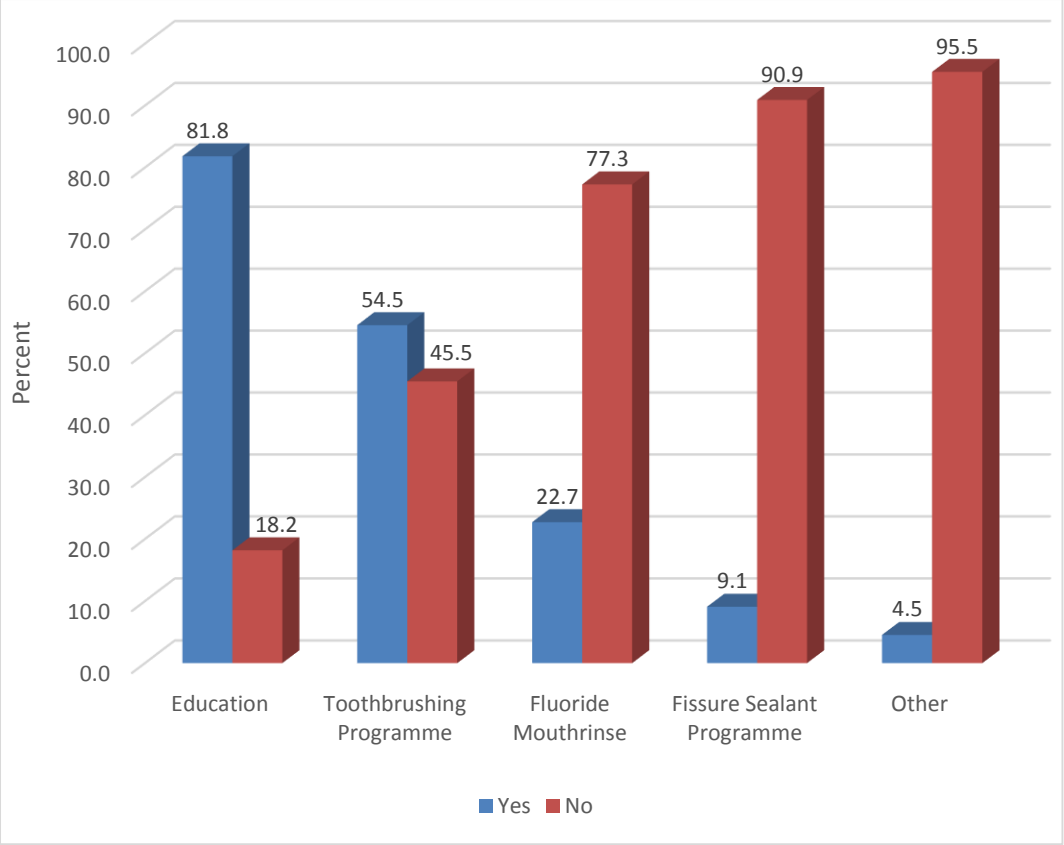

Figure 5.1: Oral Health Services

Oral health education (81.8%, p=0.003) was the most common activity conducted at schools and fissure sealant placement (9.1%, p=0.000) the least. However, supporting evidence in school records and responses to the questionnaire from school 11 and 15 in Section 5.2.3:97 specified that there was inconsistency in the frequency of these activities as they occurred only once at one of the schools, which was a quintile 5 school, and once a year in 65% of the schools. This was probably as a result of a lack of resources and staff as validated in the School Health Policy and Implementation Guidelines (2011). Besides the oral health services mentioned in Figure 5.1 above there were no other services offered at 95.5% of these schools. The one school that did respond positively to other services were unable to elaborate on the type of services offered.

A small percentage (27.3%) of the schools indicated that they had no oral health services in place as indicated in the following responses:

> *No oral health services. It was in place 3 years ago (11).*
> *Nurses must come at least once or twice a month. Nurses are understaffed. Last oral health screening was done in 2003. Only come to give vaccinations sometimes (15).*

As noted above there was little consistency in the provision of oral health services with some being discontinued or infrequent. Evidence of a high turnover and vacancy rate for oral health practitioners that impact adversely on service delivery, oral health education and school screening services was also noted in the Department of Health Strategic Plan 2010-2014. This further corroborates the findings in this study (Department of Health, 2010b). It can be assumed that these services were not available at the vast majority of the schools who did not cite such services. In lieu of the shortage of oral health personnel, Watt (2005) suggests as an alternative to consider the common risk factor approach and therefore to include oral health into general health awareness, at schools (Watt, 2005).

In response to question 1 of the study, the above results indicate that currently oral health services at school are inconsistent and not sustainable.

The next section explores the type of support provided by school health services at the designated schools.

5.2.4 School Health Services

The presence of school health services as one of the key components for the success of a health promoting school cannot be overemphasised (Kwan et al., 2005). The iLembe district manager conveyed that school health services provided preventive and curative services in their district. Though this was not available to all the schools in the district as schools were selected randomly by school health services as indicated in the following response:

> *School health services have tooth brushing projects for grade 1 at some schools that are selected randomly. The oral hygienist has also covered a number of schools with fissure sealants and scaling and polishing procedures for 6 to 12 years old. (F).*

The above narratives indicate the probability of only one hygienist in proportion to the high number of schools in that district; hence it would be impossible to render services to them all. Therefore the oral hygienist had to randomly select schools that she could attend thereby being unable to render the necessary services to the remainder as reported above by the iLembe district manager.

Eighty seven percent (87%) of the participants reported that School Health Services and screenings such as eye tests, oral examination, ring worm screening, cholera awareness, drug abuse awareness, sexual abuse awareness, vaccinations, teenage pregnancies and HIV/AIDS and tuberculosis awareness programs were provided annually by Department of Health. Supporting evidence was cited in the School Visitors log book in addition to the following responses to the questionnaire (Appendix 2):

School health nurse visits the school. Some parents don't allow their children to be part of these activities e.g. they do not fill or sign consent form (14).

Services provided are inspection of learners in Grade 1 and those requiring attention in other grades. Immunisation programmes. It only takes place once a year. (11).

An annual check-up by school health services is provided. This is set out in the year planner. They are also available to assist at all school functions (3).

They come and vaccinate the learners whenever there is a drive. Depends on the directive from Department of Health (5).

Services include teenage pregnancies, vaccines, teaching educators about road to health lessons, obesity, diseases that contaminate, conducting workshops on mental health, abuse, cleanliness, the use of pads by teenagers. We try hard that the services be continuous, but they are interrupted because of transfers by parents we get new learners, new teachers and new parents which sometimes is a disturbance on our side (7).

Services include general health e.g. rashes, eyesight, hearing. Done on an annual basis (9).

HIV/AIDS awareness programmes. Screening of grade 1 learners teeth is conducted. School health services frequently visit school for these services (13).

Immunization and cleanliness awareness services provided. Services are continuous (15).

Immunisation for various outbreaks, awareness campaigns e.g. Tuberculosis, Cancer month, AIDS day, etc. Our support team from St Francis Hospital phone us or send their representative to address learners (20).

Sexual abuse, HIV/AIDS and agricultural enrichment (22).

As illustrated it seems that priority was given to immunisation as this was reported by most schools. Other services varied and probably depended on the determined needs of the various schools. It was encouraging to note that school health nurses despite their work schedules attended school functions and conducted workshops. Awareness sessions with parents on health promotion and prevention would ensure reinforcement of healthy oral hygiene at home.

Two schools were specifically challenged by some parents not providing consent, which inevitably meant that those children could not be examined and excluded from further services. Other concerns that impacted were transfers of educators, learners and parents which affected continuity of services provided.

Of the 87% of schools that reported that School Health Services was provided, only 30% of these schools from both rural and urban areas mentioned oral health services as demonstrated below:

There are eye test, oral screenings, ringworm checking, cholera awareness, drug abuse by Department of Health and Department of Social Development. The school is informed when the nurses are visiting the school for each activity during the year, and school plans for the day (2).

Oral health service, immunisation and healthy eating habits talk. They keep on coming (10)

School health nurses assist the school by checking learners health e.g. teeth, ears and body. They refer those affected to the clinic. They are continuous because school health nurses visit the school regularly (12).

Visiting and monitoring the status of the school. They also provide support, organise awareness. Immunisation, eye test and oral test conducted. These services are interrupted because of many schools that are still under supervision and they need full support from the Department of Health (21).

In partnership with Department of Health through local clinic, nurses offer regular oral service (4).

School nurse visits school on quarterly basis providing toothbrushes and toothpaste. Screening of learners identifies those with problems, assess and provide support. Oral education is provided by the Department of Health and a teacher that has been trained keeps on monitoring the process. When schools are closed learners tend to neglect health promotion principles. Parents tend to attend to other things at home (6).

As revealed above, of the six schools only four mentioned regular oral health services. The regular oral health services was probably attributed to several factors including sufficient staff employed in the areas to offer these services, fewer schools and well-resourced districts. This demonstrates that health care delivery is not equal at district level due to inequalities in health services and inequities in resource allocation as submitted also by Dookie and Singh (2012).

Further school 6 described that educators were trained to monitor learners in oral health promotion since school health nurses were unavailable on a daily basis. This commendable initiative is vital and should be considered and inculcated to ensure sustainability of the programme in other schools. However, two schools indicated that school health nurses did not visit frequently as indicated in the following:

General health assessment/school health assessment is conducted. We last heard from the Department of Health in February 2010 (8).

We don't have a healthy relationship with school health. We battle to get them out to visit the school (5).

This was probably attributed to these schools being quintile 4 and 5 and not prioritised by the Department of Health (Department of Health and Basic Education, 2012). However, it should be noted that children who attended these schools were occasionally transported from rural areas as reported by school principals and therefore would definitely benefit from the services offered by School Health Services.

Interestingly, three (13%) of the schools from the study sample which were both rural and urban had no school health services provided as noted in the following response:

> *There is no school health services offered at the school (1).*

Similar sentiments were also expressed by Schools 15, 16 and 18 that were quintile 4 and 5. The lack of services was most likely due to staff shortages, high workloads and priority afforded to quintile 1 and 2 schools (Department of Health and Basic Education, 2012).

The above narratives convey that currently school health services are not coping with high workloads due to staff shortages and therefore priority is not afforded to oral health services. This further reveals that oral health service delivery is currently not suitably aligned. There exists a lack of coordination and synchronisation between health promoting schools and health services guidelines/policies and draft documents as they relate to question 1 and 2 of this study.

Preceding the execution of the oral health promotion programme at schools it was essential to investigate what rules exists for tuck shops and vendors and what types of food and beverages were being sold by them to learners.

5.2.5 Tuck shops and vendors

One of the risk factors to poor oral health is unhealthy diet and nutrition (Petersen and Kwan, 2010). The significance of encouraging tuck shop owners and vendors to support healthy eating initiatives cannot be overemphasised (Kwan et al., 2005). It was therefore imperative to explore strategies that were influential on the sale of items at tuck shops and vendors at schools. Provincial and district managers were questioned on what level of control they possessed on items that were being sold at their schools. The response from the provincial manager from the Department of Education was as follows:

> *Yes there are guidelines provided by the school nutrition programme and support is given to the School Governing Body in respect to vendors (A).*

Evidence of the above response was seen in the Draft National School Nutrition Programme Policy (2011). Broad guiding principles were provided for tuck shops and vendors but there was no specific mention of the types of food to be sold (Department of Education - KwaZulu-Natal, 2011).

The district managers informed that vendors and tuck shop owners were acquainted about the sale of healthy foods and required to comply with the promotion of healthy eating during school hours:

> *During an assessment of the health promoting school the tuck shops and vendors need to meet the criteria. Tuck shop owners and vendors are educated and encouraged to buy into the process. They are made part of the health promotion committee (E).*
> *We educate the vendors on what to sell to the school communities and some schools have policy regarding what the vendors should and should not sell (D).*

However numerous challenges encountered revealed the following responses:

> *We have some control over the tuck shop but the challenge is – the person who runs the tuck shop or school vendor, their agenda is to make a profit. Sell things that are quick sales like sweets and chocolates. A lot of schools are doing sandwiches, pies and fruit. Fruit is good but is expensive. Have some healthy foods but also have cheaper lines of sweets. Need to constantly educate them. Children don't carry a lot of money so can't buy expensive things. Education is there but the demand is greater for cheaper sweets. Also try to educate educators about their eating habits to set example for children.*
> *School has some control over outside vendors. Encourage vendors to sell seasonal fruit which is cheaper. School health nurse suggested giving vendors in service training on healthy snacks, etc. (C).*
> *We involve vendors and try and engage them in selling healthy food- fruit and water. If the tuck shop is selling healthy food the children still go out and buy unhealthy food from the vendors. There has to be a balance – with time there should be changes (B2).*
> *Schools have a policy- only think it needs community involvement – issues of aunties – sell food that is not suitable. Healthy food is expensive (B1)*

A possible suggestion as indicated by manager C that educators provide a mentoring role to demonstrate healthy eating, another offered that training to be provided to vendors on the sale of healthy foods. This suggestion is further validated by Kwan et al. (2005) who specified that educators should be trained so that they acquire the skills to sustain a healthy lifestyle and integrate their knowledge and skills into their teaching (Kwan et al., 2005).

Of significance also was that although attempts are made to regulate items sold by the tuck shops and vendors, healthy foods were expensive and therefore unaffordable by most learners. French et al. (2001) argued that a favourable change in the pricing of healthier snacks made learners select them. In addition, a free fruit scheme in schools in the United Kingdom and providing a free piece of fruit or vegetable to learners in Norway was found to be an effective strategy for the increase in intake of healthy foods (Bere et al., 2005, Kwan et al., 2005). Kwan et al. (2005) advanced that although the subsidizing of healthier snacks would have resource implications, it should be nonetheless considered. Moreover, the inextricable link between unhealthy consumption amongst South African children and the increasing obesity rates are of constant concern.

During the researcher's visits to the schools attempts were made to engage the vendors on items sold to learners. A challenge identified was that this was their only source of income and they could therefore only afford to buy and sell the cheaper unhealthy foods. Changing this would decrease the profit margin and healthier options will invariably mean charging the learners much more, which ultimately affects sales. However, it was encouraging to note that some vendors were attempting to sell healthy foods such as, home-made popcorn, which did not contain colorants and was priced lower, hence affordable for the learners. The distribution of tuck shops and vendors in rural and urban/peri-urban schools is presented in Table 5.14.

Table 5.14: Distribution of tuck shops and vendors in rural and peri-urban/urban schools

	Tuck Shop	Vendors	Both
Rural	4	5	1
Urban/Peri-urban	7	2	1

Of the total (23) sample eleven schools (48%) had only a tuck shop and seven (30%) schools had only vendors present with only two schools (9%) having both. There were no tuck shops or vendors present in three (13%) of the schools. Vendors were present in most (26%) of the rural schools compared to tuck shops that were present in most (35%) of the urban and peri-urban schools. Most participants indicated that they had limited influence over the vendors while one participant stated that they had no influence at all. Tuck shops were managed by the school or tendered externally. The tuck shops that were managed externally were therefore problematic to influence. Schools also possessed little influence and effect over items being sold at stores or home vendors that were located within close proximity. This is apparent in the following responses from the school participants:

We have vendors – and have some control although sometimes they do not listen (4).
School runs the tuck shop. There is a shop nearby. We cannot control what is being sold at the shop. (6).
No sweets or chocolates sold in the tuck shop. We don't have control over the vendors. Trying to control what they sell is difficult (18).

From the responses above it is reiterated that schools have no control over what is being sold beyond their premises. However, St Leger (2004) suggested that a quality health promoting school should be forming links with the local community in particular food suppliers to reach an understanding on what to sell that would benefit all.

The sale of healthy foods was mentioned by only three (13%) school participants.

Tuck shop only stocks health conscious products (1).
Tuck shop changed – no sale of sweets and coke to learners (18).
Healthy sandwiches, salad rolls, milo, bottled water (8).

Schools 8 and 18 were quintile 5 and school 1 was a quintile 3. However, in the focus group interview school 1 indicated that at that point in time the tuck shop was out of stock but they attempt to sell healthy foods. Beyond the oral health implications the overall ramifications for pupil healthy options are a further concern for children in South Africa, particularly with the childhood obesity rates which has become a public health concern with the prevalence of obesity rising to 13,5% for the 6-14 year age group (Shisana et al., 2013, Gupta et al., 2012).

The majority of the participants (87%) indicated major barriers in the sale of healthy foods to children.

Tuck shop out sourced we therefore have limited control (3).
No healthy foods are sold at the tuck shop (16).
Limited – more chips, cool drinks and sweets- as these are demand items (17).

Schools 3 and 16 were quintile 5 schools and school 17 is quintile 2. Largely it would appear that what is being sold at the tuck shop depends largely on the initiatives of the school team and their awareness of retailing healthy foods.

5.2.5.1 Challenges

Although schools endeavour to alter what items are being sold at the tuck shop they face many challenges as explained in the following narrative:

> *Although we try to control the sale of healthy foods children buy cheaper sweets because fruit is expensive. Also if we don't sell chips at school the children buy it from the shops outside (6) Tuck shop is tendered out – we do oversee the sale of healthy foods but affordability is a problem with the children. Neighbouring homes also sell to the children but we cannot control what they sell. Police do monitor vendors and fine them but this is not consistent (16) Did suggest selling healthier foods but with the background that our children come from they cannot afford the healthier foods. Fruit is perishable. Spaza shops nearby sell unhealthy foods – we have no control over this (8).*

The responses above verify three common challenges that the schools encounter. Fruit was firstly expensive and therefore unaffordable. In addition fruit was perishable and therefore could not be stored for a long period of time. The schools also had little control over the unhealthy foods that were being sold beyond their premises. Here again as noted by St Leger (2004) that links should be formed with the outside community to control what is being sold (St Leger, 2004). Vendors should also be included in healthy education and consultations at school to create awareness to the sale of healthy foods to learners.

These challenges identified by the school health teams were akin to those by district managers C, B1 and B2 in Section 5.2.5:102-3.
The participants in the focus group interviews proposed possible strategies that could be implemented to assist students in selecting the best foods to consume.

5.2.5.2 Strategies

The following strategies were advanced in promoting healthy options for better oral health during the focus group discussion:

> *Educating children not to buy unhealthy foods would help. Posters showing rotten teeth and healthy foods to eat would help to show the children the consequences of eating sweets. Showing posters of decayed teeth made a huge difference to the learners. It is also the responsibility of the parents – if they take time in the morning to pack a healthy lunch and not give their children spending money this would help. One teacher had a meeting with her*

parents and told them that the children in her class must only bring healthy lunch and that no sweets or spending money was allowed (9).

Educate parents and children as to what is healthy to eat. Encourage children to drink more water (17).

From the above responses, educators suggested posters and teaching children about healthy eating for the improvement of health and oral health. In addition, educators cited the necessity of parents taking more responsibility for what foods their children consumed as healthier lunches options. The strategy that the educator from school 9 employed with her learners was commendable. She established that her learners were more attentive in class and easier to control because they were not allowed food containing high sugar. This resulted in her achieving two goals – an attentive class and reducing the risk of caries for learners in her class. From this response it can be emphasized that such initiatives from educators can influence the learner's healthier eating habits. A suggestion for policy planning is that schools should have some control over the types of lunch learners bring. Furthermore, if this was included in policy it would assist educators in controlling the types of foods learners consume thereby assisting with the promotion of oral health.

The subsection below relates to question 4 of the study on the interrogation of the curriculum for the inclusion of oral health promotion into general health promotion.

5.2.6 Curriculum

The World Health Organisation contends that the incorporation of oral health promotion into the school curriculum can be easily administered by educators (World Health Organization, 2003b). It was therefore essential to inspect the coverage of oral health promotion in the school curriculum.
There was only a mention of oral health screening in the School Health Policy and Implementation Guidelines (2011) and the Integrated School Health Policy (2012) as noted in the policy reviews in Section 5.1:81 (Department of Health and Basic Education, 2012, Department of Health, 2011b). This was further reinforced by responses from the provincial and district managers who indicated that there was a lack of priority given to oral health. This is reflected in the following responses:

There is awareness to basic hygiene being included in the curriculum but not oral health (A)

I am not sure whether it is part of the curriculum but it should be. Personal hygiene is included in the curriculum and oral health is part of personal hygiene. Nutrition is also part of education and heads the priority list and when you talk about nutrition you should bring oral health into it as well. The educators may be able to tell you more – but because it is a health issue they expect this from the Department of Health (B2).

One manager identified the need to prioritize oral health promotion as emphasized below:

> *Oral health promotion was identified as a critical gap in the Health Promoting School Initiative and it is vital that it be part of the health promotion programme so that it would enable children to take care of their teeth and prevent long term oral health problems (C).*

The participant correctly shared her thoughts on early intervention to prevent future oral diseases. Kwan et al. (2005) deliberate that oral health promotion at an influential stage in a learners life were lifelong beliefs, attitudes and skills are developed, is vital for the prevention of oral diseases (Kwan et al., 2005).

School principals responses were also invited (Appendix 2) on types of oral health promotion activities that were implemented at their schools. There were only four positive responses from the 23 schools as indicated below:

> *Rhymes are incorporated into the curriculum however some learners lack motivation at home (13).*
>
> *Have talks at assembly. Practical demonstrations and drama by the health buddies (16).*
>
> *Lessons on how to keep your body clean and how to take care of teeth (15).*
>
> *There are many health promotion activities that would assist learners. These are not covered in the curriculum but included in the year planner. Therefore there is no prep evidence. Sometimes information is not enough and when you urgently need it, department is not available for assistance (7).*

Obviously only one principal noted that there were lessons on oral hygiene. Another specified that although it was not incorporated in the curriculum it was in the school's year planner. This therefore resulted in the teachers having little proof of the additional activities that they were undertaking in their prep books. In addition, one of the challenges teachers emphasized for the implementation of these additional activities was the lack of information provided to undertake these activities. They would require training in certain aspects of health promotion as further demonstrated in Section 5.2.7:110 by responses from schools 2, 6 and 8.

Two schools indicated that they only undertook what was prescribed in the curriculum as illustrated below:

We are restricted to what is prescribed in the curriculum (8).
No we only have curriculum related personal hygiene (11).

Suggestions on what could be undertaken differently were reported by two of the schools:

Oral health education must be reinforced across the curriculum by introducing examples and activities (14).
Oral health promotion should be part of the curriculum so that every learner is involved and funding is vital (11).

The response from school 11 indicated that funding would be vital for this programme though this would not be possible, as the Strategic Plan for 2010-2014 noted that there was a shortage of funds for oral health (Department of Health, 2010b). This was similar to experiences in countries worldwide (Petersen and Kwan, 2010).

All (100%) participants from the focus group discussions agreed that oral health promotion should be included in the curriculum which will categorically assist them especially with time management challenges. This is reflected in the following statements:

Yes it would help as we have problems with time management (1).
Yes because time would be allocated (2).
Yes it should be included in life skills (4).
Yes it would – the child would benefit. The curriculum is demanding so there is no time at the moment. The tooth brushing is time consuming to do every day – it should be done at least twice a week (8).

Similar views were expressed by the other schools. Issues with time management were further validated in responses in Section 5.2.7.1:110-11 from schools 2, 4, 5, 8, 10 and 11. However, although educators felt that tooth brushing should be conducted at school every day; one also maintained that learners would then not brush at home as illustrated in the following statement:

We feel that if tooth brushing is done at school every day the child is not going to brush at home and come to school with smelly mouths (3).

In addition, school 16 specified that they had included oral health promotion into their life skills curriculum although this was not stipulated by the Department of Education. They recommended that if the Department of Education incorporated it in the curriculum, it would assist:

Yes we do bring it into life skills but there is no mention of it – so putting it into the curriculum will definitely help (18).

One participant maintained that oral health promotion would be advantageous in the rural areas since it was not prevalent in their culture to brush their teeth and hence it would ultimately benefit the learner in the long term. This was evident from the following responses:

Yes especially in the deep rural areas everybody must know about oral health because it is not in our culture to brush our teeth (6).
Yes it is beneficial to the children in the long run. If they learn how to take care of their teeth at a young age this will carry through their lives (11).

The above responses displayed that participants identified the importance of oral health promotion, especially in the rural areas, and the necessity for the inclusion of oral health within the curriculum.

From the narratives above it is noted that oral health promotion is not incorporated into the school curriculum and teaching practices. Oral health promotion therefore needs to be specifically mentioned in the life skills curriculum for it to be included and translates in school activities as educators at school follow a stipulated curriculum and are expected to adhere to time frames.
Wierzbicka et al. (2002) argue that if oral health was to be included into the curriculum then educator training to equip them with the necessary knowledge and skills would be imperative so that the oral health promotion programme can be delivered effectively (Wierzbicka et al., 2002).

5.2.7 Training

It has been established that it is crucial for educators to be trained in oral health promotion (Kwan et al., 2005). All participants in the focus group discussions overwhelming agreed for the inclusion of oral health promotion into their teacher training programme as demonstrated in the following responses:

Yes it would help us to promote oral health. The qualified teacher would come with that knowledge already (2).
Yes it should. There are lots of changes so it is important for us to learn (6).
Yes it is a good idea because it is presently not in the curriculum in certain institutions. If it is done in training teachers would see the importance of it. It should be incorporated in Life Orientation. At the moment only other diseases are done at the university (8).

Similar opinions were also articulated by the other participants in the focus group interview. Educators maintained that by including this knowledge into their curriculum it would be of benefit to them and ensure transfer of knowledge to learners. Moreover, it would benefit learners especially those who were orphaned:

> *Yes it should be included in life skills because some learners don't have parents and therefore need to be educated about oral health. As an educator we should be doing it (15).*
> *That would be a plus. It would benefit teachers (18).*

5.2.7.1 Challenges

Although the implementation of the oral health promotion programme would have multiple benefits to learners, educators and parents, there exist several concomitant recognized challenges.
Of the total focus group sample, the majority (70%) of the schools identified time constraints as a major challenge. Typical responses were:

> *Contact time with learners was disturbed (2).*
> *Large classes (48-50 learners) were difficult to control and therefore took time (4).*
> *School curriculum does not allow for too much diversion as times are stipulated for each aspect of the curriculum (5).*
> *Tooth brushing was time consuming. Curriculum and Assessment Policy Statement hardly make provision for oral hygiene to be conducted on a regular basis (8).*
> *We don't have enough time (10).*
> *We only do what is relevant to the curriculum due to time constraints. Anything additional is difficult because learners have transport challenges. Also the school enrolment is high so it becomes impossible to manage large numbers (11).*

Schools 14, 18 and 21 shared parallel views as school 10. From the responses above it is evident that besides time constraints participants also experienced pervasive difficulties with transport and large classes.

Because of time constraints one of the educators proposed that learners take their toothbrushes home and use them. This however created other challenges as some learners did not use them at home and others lost their toothbrushes.

Seemingly, educators at two (15%) schools managed with a five minute procedure

Coped with time – procedure took five minutes (10).

Time is enough – have small classes – we use 5-10 minutes after meals for tooth brushing (15).

One of the participants also specified that low staff numbers meant that educator workloads were more as shown in the response below:

Small staff – workload is greater (11).

These additional activities would undoubtedly and incrementally add to their existing workload. These results are aligned to a study comparing the views of teachers in South Africa (Swanepoel, 2009).

5.2.7.2 Barriers

Provincial and district manager's views elicited factors that influenced the implementation of oral health promotion at schools. The provincial manager from the Department of Education identified time and accountability:

Space in the school day, curriculum demands, and there is no person accountable for leading the programme (A).

This response was related to the response from the schools for the challenges that they experienced in implementing an oral health promotion programme, as noted in Section 5.2.6:108-9 from schools 1, 2, 4, and 8 and Section 5.2.7.1:110. The presence of no person accountable could potentially contribute for the failure to implement the oral health promotion programme. Clearly lack of capacity, poor infrastructural support and large number of schools are factors that prevent health promoting school initiatives.

Findings in this study are further illustrated by challenges and barriers that were identified in the School Health Policy and Implementation Guidelines 2011 and the Integrated School Health Policy 2012. Evidence of the challenges and barriers noted above are also identified in studies by Mohlabi et al. 2010, Swart and Reddy 1999 and Vergani et al. 1998. Here again although the study by Mohlabi et al. was conducted ten years after the other two studies similar challenges and barriers still prevail.

One of the functions of the Health Promoting School is the creation of awareness to the causes and prevention of common diseases including oral diseases (World Health Organization, 2003b). The next section examines whether awareness was created with the Health Promoting School Initiative.

5.2.8 Awareness

Since the schools that were included in the study were established Health Promoting Schools it was necessary to assess whether awareness was created at the schools included in the study prior to and after the implementation of the intervention. Moreover, awareness was also identified as one of the properties that emerged in the situational analysis category. The four dimensions consisted of lack of awareness, creation of awareness, awareness to correct brushing technique and frequency and community awareness.

5.2.8.1 Lack of awareness

All managers (100%) from the province were familiar with basic hygiene being included in the curriculum but were unsure on whether oral health was included. This is demonstrated by the following responses:

> *I won't commit myself and say yes – but I am thinking supposedly it should be (B1).*
> *I am not sure whether it is part of the curriculum but it should be. Personal hygiene is included in the curriculum and oral health is part of personal hygiene. Nutrition is also part of education and heads the priority list and when you talk about nutrition you should bring oral health into it as well. The educators may be able to tell you more – but because it is a health issue they expect this from the Department of Health (B2).*
> *Yes basic hygiene is included in the curriculum (A).*

As noted above the one participant reported definitively, however the other two were unsure. The above commentaries reveal that some managers in strategic posts are not acquainted with the inclusion of oral health in the curriculum, although oral health has been identified as a significant governmental priority in South Africa (National Department of Health and all Oral Health Stakeholders, 2010).

The majority (83%) of the managers in the province and district were unaware if training programmes was being offered as illustrated in the responses below:

> *I am not aware of any specialised training offered to educators (A).*
> *No I am not aware. I am not sure if the school does anything (C).*

I am not aware of any sustained oral health promotion programme for the staff except that when we as health promotion co-ordinators talk about healthy lifestyle to the staff we mention healthy eating and oral hygiene. (D).

Although it was noted by manager C that she was unaware of training programmes being offered to teachers and school health nurses, similar views were mentioned by managers E and F. As shown above one of the district managers declared that there was cursory "mention" of some form of health promotion conducted with teachers in their district.

In addition, an attempt was made to ascertain if there was a Health Promotion and or Oral Health Promotion Manual (Appendix 1). It became evident that no manual exists as demonstrated by the following responses by managers:

The national departments of education and health have collaborated to implement the Integrated School Health Programme which is aimed to promote the mainstreaming of health services. The health promoting schools programme has been absorbed into that programme. These schools are in the process of receiving resources, services and programmes to promoting healthy lifestyles, bodies, hygiene and medical care (A).
Not that I know of – not aware of health promotion or oral health promotion manuals at schools (C).
Not aware. But oral health is part of the Integrated School Health Programme. All health promoting schools are encouraged to include oral health (E).
I am not aware of this oral health promotion manual (F).
No – only take pamphlets and leaflets to school but there is no manual (B2).

As noted from the responses above the implementation of the Integrated School Health Programme was mentioned by two managers. Although manager A stated that schools were in the process of receiving resources, there was no evidence of this on the researcher's visits to the school. This reiterates the findings at the beginning of Section 5.2.8.1:113 revealing that provincial managers are not familiar with school level resources. In addition manager E indicated that oral health was part of the Integrated School Health Programme. However, on review of this programme it became evident that only oral health screening was present in this programme and that there was no specific mention of oral health prevention and promotion in the Life Orientation curriculum (Department of Health and Basic Education, 2012).

5.2.8.2 Creation of awareness

From the document Oral Health Promotion: An Essential Element of a Health Promoting School, it is essential to include awareness on basic hygiene, cleanliness and oral hygiene in health promoting schools (World Health Organization, 2003b, Department of Health: Health Promotion, 2000). Prior to the implementation of the oral health promotion intervention school participants indicated that learners were aware of basic hygiene, cleanliness and oral hygiene as illustrated by the ensuing responses:

> *Learners are aware of hand washing, toilet routines, cleaning school premises and are taught to keep the school clean (1).*
> *A small number has embraced the oral health programme (3).*
> *There is a great improvement on learner's oral hygiene (4).*
> *There seems to be a difference when learners proceed to second grade and higher grades. Good oral habits are practised (6).*
> *Foundation base learners now know the importance of taking care of their teeth (8).*

Principals from schools 13, 14, 15, 17 and 23 shared similar views to the principal from school 1. It was impressive to note from the above that the learners were now accustomed with the procedures for basic and oral hygiene and that a general improvement was evident. Furthermore, the principal from school 6 cited progress in oral hygiene in children that had proceeded from Grade 1 onwards.

All (100%) focus groups members comprising of the school health teams in the third phase of the study emphasized that the impact of the interventions had created awareness of both health and oral health for their learners. Suggestions were evident by the following narratives:

> *It has made learners more aware about their health and the importance of oral health. Children are now interested in tooth brushing. Some children don't have toothbrushes at home – only do tooth brushing at school (1).*
> *Some of the learners were happy because they don't have tooth brushes and toothpaste at home. Learners learnt how to brush their teeth – children used to come with smelly mouths and yellowish teeth (2).*
> *Made them aware of the importance of tooth brushing (4).*
> *Pupils were not brushing so doing this programme helped them. Our students come from rural areas and it was noted that they had no exposure to tooth brushing – so they now knew what it was. They also learnt the proper method of brushing. Children were happy to have their own tooth brush (9).*

Learners have benefitted because they now know why it is important to brush their teeth in the mornings and evenings. They also remind their parents to brush their teeth (10).
The children's outlook on eating has changed. Learners are aware particularly with what they eat. Correct their friends when eating unhealthy foods. Children choose fruit over chips from vendors (16).
Learners learnt that healthy foods will not destroy their teeth. Enjoyed brushing and learnt how to brush properly and how to handle the tooth brush (21).

The above responses were from Quintile 1 to 5 schools. Similar thoughts were articulated by the remainder of the schools involved in the focus group interview. As established above, in addition to being aware of the significance of health and oral health, learners learnt how to brush correctly and also reminded their parents to brush. It must be noted that although school 9 was a quintile 5 school, the pupils that attended the school were residents from rural areas and could not afford tooth brushes and paste and therefore had little exposure to tooth brushing.
Moreover, learners had also increasingly become aware of the correct foods to eat as noted in the responses from the focus groups at schools 16 and 21. Moreover, one learner in school 16 sought the researcher's opinion when the focus group interviews were conducted with the following question:

"I am unhappy with the colour of my teeth. What can I do to prevent this discoloration?"

The educator at the same school provided the following information:

"A learner in my class visited her dentist for treatment and he offered her a sweet at the end of the visit. She refused the sweet as she had now learnt that this was not good for her teeth."

The educator attributed this marked improvement in the awareness that was created by the oral health promotion programme.

Oral hygiene awareness was also created for educators and parents in 46% of the schools, as demonstrated in the following comments:

Teachers are now more aware about oral health and how important it is (1).
It was beneficial to the teachers – an eye opener – to check their own teeth and see what is present (6).
Awareness has been created for parents (22).
Learners now remind parents to brush their teeth (10).

At a parents meeting, parents mentioned without prompting about the tooth brushing and that they are happy that learners are taking care of their teeth (15).

Evidently, such positive explanations about the impact of the oral health promotion programme were validating (Catteau et al., 2013). The implication of parental involvement was further noteworthy. Saied-Moallemi et al (2009) also argued for parental awareness of the intervention at schools (Saied-Moallemi et al., 2009).

Tooth brushing programmes also created awareness with the learners as ascertained in the focus group discussions.

5.2.8.3 Manual brushing technique and frequency

The effectiveness of brushing daily with fluoride toothpaste is supported and reinforced by clinical trials (Ellwood and Cury, 2009, Marinho et al., 2003a).

Four (31%) of the focus groups that participated in Phase 3 indicated that the tooth brushing programme implemented had created the appropriate awareness of the correct brushing technique as specified by the following commentary:

Learners learnt how to brush their teeth as some of the learners were not familiar with the tooth brushing routine (2).
It is in their culture – don't brush their teeth – they have now learnt how to brush their teeth (6).
They also learnt the proper method of brushing (9).
They know now why it is important to brush their teeth in the mornings and evenings (10).
Children learnt how to use toothbrushes and toothpaste (16).
Enjoyed brushing and learnt how to brush properly and how to handle the tooth brush (21).

Noticeably, from the responses above the tooth brushing programme successfully inculcated correct brushing techniques and further routinized the daily practice of learners by brushing their teeth at least twice a day. For many learners, especially in the rural schools, brushing only occurred at school as parents could not afford toothbrushes and toothpaste as revealed also in responses from schools 1, 2 and 9 in Section 5.2.8.2:115. Parents also did not brush their teeth as it was not in their culture as noted in the focus group discussion from school 6. Evidence of the impact of cultural values on the effectiveness of oral health promotion interventions was publicized in studies by Schou and Wight

(1994) and Rayner and Cohen (1970). As much as these studies were conducted more than 10 years ago, cultural values continue to impact, as noted in the present study.

Although there was some success reported with the tooth brushing programme, educators also highlighted challenges experienced with this programme. A challenge acknowledged by three (23%) schools was that learners chewed on their toothbrushes and ate the toothpaste as maintained by the following responses:

> *Children chew on their toothbrushes and damage them – they therefore don't last long (4).*
> *Toothbrushes don't last – children chew on the brushes (6).*
> *Children also eat the toothpaste (9).*

From the above responses it was noted that because of habitual chewing, the tooth brushes did not last long and this therefore impacted on the tooth brushing programme as replacement of the toothbrushes was not affordable, as noted also in responses from schools 3, 10, 12 and 15 in Section 5.3.1:125.

Community commitment is integral to the success of the HPS; hence the level of awareness within the community had to be explored.

5.2.8.4 Community Awareness

It is imperative and logical to maintain sustainability beyond the school therefore parents had to also be cognizant of health and oral health promotion initiatives. However, their involvement with these initiatives was invariably affected by privileging on priorities that they encounter particularly because of levels of poverty and affordability. Community awareness was created by the health promoting school initiative in 74% of the schools, as validated by the subsequent responses:

> *The community is aware that the school promotes cleanliness, healthy food and healthy environment. Since the school is in the rural area most of the community learn healthy knowledge from this project (2).*
> *The programme centres on focal areas – personal and social development, emotional safety, sustainable gardens, etc. (3).*
> *Learners are aware of social ills like abuse and they are able to inform relevant people (5).*
> *Most projects involved parents and the community. It changed the mindset of parents about school and created a sense of ownership (7).*
> *Parents have been consulted and the importance of healthy eating habits and exercise emphasised. Parents are more health conscious especially with their children's lunch (9).*

Most learners have immunisation cards. Parents are aware of the importance of immunisation. Each and every home has a vegetable garden (10).

Programmes have helped the school to reduce diseases such as scabies and ringworms. Learners also get treated for worms (12).

It has promoted healthy living within the community (13).

The programme has empowered our community to own their lives. They take control of improving their lifestyles. Parents come to school to assist us in gardening together with soul buddies (14).

Sustainable vegetable gardens and the correct method of planting are introduced. Parents assist with cleaning the school and gardening to offset school fees (15).

It has been able to raise community awareness but to a minimum extent. Other departments seem to show interest. Some of the community members are part and parcel of the school development, e.g. planting the gardens and maintenance. They also attend awareness campaigns (21).

Community know about cleanliness, safe buildings, hazard free environments, enrichment in agriculture and crime free area (22).

The programme informs the community on the importance of living in a healthy environment. School nurses visit the school and attend parents meetings to address them on different health topics (23).

Most community members do comply with the concept though we have some short comings with the disposal of refuse e.g. Disposable nappies and disposed building material (20).

As noted above the Health Promoting School Initiative had made an affirming impact in the majority of the schools by creating the desired awareness within the community.

However, the principal from school 20 indicated a problem with the disposal of refuse. This was further validated with their response to the data capture sheet (Appendix 3) where they logged refuse disposal as being inadequate and recycling as poor. In addition, the principal from school 10 specified that every home had a vegetable garden. This was a quintile 1 school located in a rural area. The community through the health promoting school initiative was therefore encouraged to plant their own vegetables for their sustenance and nourishment. This is recommended by the World Health Organization global strategy on focusing actions on the social determinants of health for the prevention and control of non-communicable diseases to attain improvements in oral health that were sustainable and to reduce oral health inequalities (Watt et al., 2001, World Health Organization, 2000a, U S Department of Health and Human Services, 2000).

It was interesting that some parents assisted with the programmes in lieu of school fees. However, some participants cited that the community still faced many socio-economic challenges as illustrated in the following responses:

> *There are high levels of poverty, HIV/AIDS, Tuberculosis (3).*
> *I don't think community awareness has been raised. By the look of things our surroundings are still unclean with papers and plastics lying around (4).*
> *Not working however - purely a lack of interest as these issues are not viewed in a serious light (16).*
> *Yes the health promoting school has to a large extent created awareness amongst the learners however there is a challenge with the parents (11).*

From the narratives above it is evident that although participants indicated that community awareness had been raised in their schools, there were specific challenges that they are constantly confronted by. In South Africa statistics presently indicate that the province of KwaZulu-Natal has the highest tuberculosis rates and the co-infection rate of tuberculosis and HIV stands at 65% (Department of Health - Province of KwaZulu-Natal, 2014). The extraordinary high statistics would infer that these diseases would have to receive priority in funding to reduce the burden of disease resulting in an inequitable distribution of funding. This was also evident in studies by Harrison (2009) and another by Peterson (2009) in Tanzania where high priority was afforded to widespread infectious life threatening diseases and low priority to oral health (Harrison, 2009, Petersen, 2009). Moreover, the province's poverty levels is currently at 45.1% (Department of Health - Province of KwaZulu-Natal, 2014). These statistics validate reasons why parents have to prioritise spending and therefore tooth brushes and toothpaste does not qualify as a priority. Although awareness has been appropriately created by this programme the parents cannot afford to sustain this programme because of affordability.

Community support and collaboration is imperative for the success of an integrated school health programme (Department of Health and Basic Education, 2012). It was therefore vital to determine the existence of available community support and collaboration at these schools.

5.2.9 Community Support and Collaboration

Booth and Samdal (1997) maintain that in order to sustain interventions at school it is essential to share a good relationship with parents and the community (Booth and Samdal, 1997). Forty eight percent (48%) of the principals reported in the questionnaire that community involvement in school health programmes was voluntary. However, one of these schools reported that parents expected payment for their assistance as indicated in the following:

Parents assist the school by cleaning premises, surroundings and watering garden and eradicating weeds (11).

Parents assist in the vegetable garden to offset school fees (15).

Parents assist in cleaning the school premises but some parents expect payment for this (20).

Responses to the principal's questionnaire (Appendix 2) on the activities and programmes that communities were involved in are illustrated in Figure 5.2. The most common activities included HIV/AIDS (77.3%), sexual abuse (54.5%) and agriculture (59.1%) as compared to recycling (36.4%), tobacco use (36.4%) and nutrition and food safety (45.5%). The most involvement in HIV/AIDS by the community could be attributed to the high prevalence rates in HIV/AIDS in KwaZulu-Natal (Department of Health, 2014a). These activities are part of the minimum package of health services that are provided at the schools and are prioritised according to the needs of the community. It must be noted that oral health promotion was not specifically mentioned as a minimum priority area (Department of Health and Basic Education, 2012).

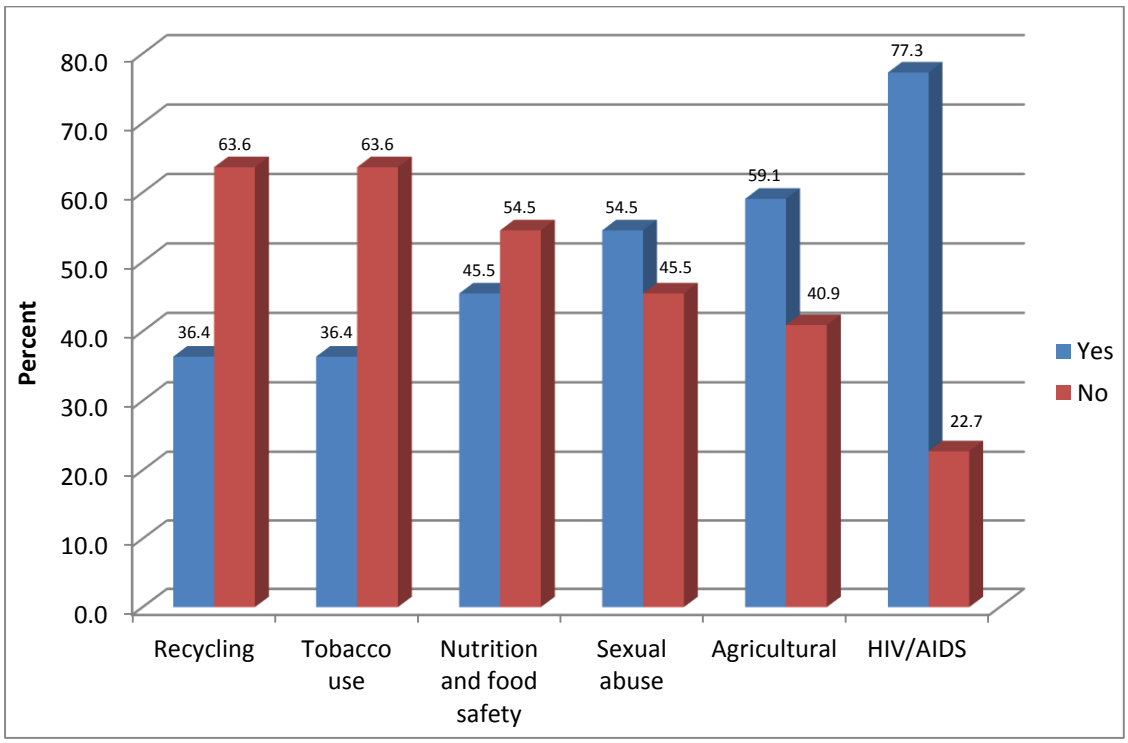

Figure 5.2: Community activities and programmes

This level of involvement by the community is reflected in the following statement by the school participants:

Road safety activities, drug substance abuse, sexual abuse, poverty alleviation, garden planting one home one garden project, sukuma sakhe project, santa projects to assist the child headed homes (7).

School involved with collaborative efforts with community. Parent's day, parents meetings and heritage days are held and on the agenda most of the things concerning life are mentioned (2).

School involved with collaborative efforts with community such as HIV/AIDS, senior citizens and food gardens (3).

We have three soul buddyz clubs which are our ambassadors. We interact with environmental health, agriculture, Department of Health, community workers, South African Police service, local induna, head men, shopkeepers, etc (6).

There are two crèches that are supported by the school. The school also makes food parcels for a very needy family (5).

Invite all stakeholders that are involved in health education such as road safety, fire dept. Sexual abuse, HIV & AIDS awareness, we normally do this if we have campaigns (14).

HIV/AIDS was one of the more common activities mentioned which validates the responses in Figure 5.2. The numerous and varied activities the community was involved in was probably dependent on the needs of that particular community. This is supported by Rothman (2007) that priorities need to be determined by that community to ensure collaboration to "work cooperatively" (Rothman, 2007).

Community support and collaboration however did not occur in five of the eleven districts as demonstrated in the following responses:

Community involvement is lacking (18).

No – most parents work and are not available during the day. School not involved with collaborative efforts with community - We would like to – we need more information, etc (11).

Schools 4, 8, 9, 16 and 20 expressed similar views as school 18. It was noted that most parents were employed and were therefore not available during the day. A further challenge which could deter parental involvement was distances, since learners lived and travelled from other areas not in close proximity to the school as noted in Section 5.2.8.2:116 and therefore parents were not living in close proximity to the school to offer support and engage in collaborative activities or programmes. It was further noted from School 11 in the above responses that participants were also not aware of any collaborative efforts they could get involved in with the community indicating a lack of guidance and support from the Department of Education.

The next section, relates to Objective 5 of the study and reports on some of the results obtained from the focus group interviews (Appendix 11), in the third phase of the study where the intervention of the oral health promotion programme was evaluated to establish the opportunities and barriers that were present at the schools.

5.3 Opportunities and Barriers

Sustainable support is central to oral health promotion interventions. Support was a property that emerged from the category of opportunities and barriers and comprised of two dimensions namely support for interventions and resources.

5.3.1 Support for interventions

Of the total focus group sample, five (39%) schools indicated that they had some support for interventions but it was not continuous, and seven (54%) schools received no support at all. This was evident from the following responses:

> *We got some support from Colgate and Department of Health. Dentists brought tooth brushes but this is not regular. There is no support from the business sector. Dentists spend most of their time in the clinic. They only visit the school when they have toothbrushes and toothpaste to give the children. There is no oral hygienist employed to do the preventive programmes and there are too many schools to visit so they cannot visit on a regular basis (6).*
>
> *Besides Colgate there is no support. Department of Health does supply toothbrushes but this is not on a regular basis (9).*
>
> *Colgate visited. School health nurses also visited and showed the learners how to brush (21).*
>
> *Nurses from the clinic checked the children's teeth and they brought tooth brushes. Besides this we received no other support (2).*
>
> *Nurses must come at least once or twice a month. Nurses are understaffed. Last screening was done in 2003. Only come to give vaccinations sometimes (15).*
>
> *Dental Therapist visited school. The school health nurses come twice a year to screen the children. (18).*
>
> *Toothpaste ran out. Teachers had to bring it to continue with the programme. No support from governing body. Businesses not doing well so there is no support with donations. Children have not been to see a dentist. Parents don't pitch for meetings*
> *(11).*
>
> *No support – parents are asked but they give no support (1).*

As revealed above, 3 schools were visited by Colgate. On further enquiry it was established that although this company had formed a partnership with the Department of Basic Education and Department of Health, there was currently only one mobile unit serving the entire province of KwaZulu-Natal. Therefore, the schools were only visited once and provided with supplies for 2 – 3 months. The school health nurses also supplied toothbrushes and toothpaste that was provided by the Department of Health to the schools but on further investigation it was revealed that this also occurred once a year and discontinued thereafter. This concern was also noted previously in Section 5.2.3:97. Moreover, this practice was not afforded to all the districts. This could also be due to staff shortages and priority given to other health priorities as reported by school 15.

From the focus group discussions it was discovered that numerous schools were unaware of the supply of toothbrushes and toothpaste offered by Colgate and the Department of Health. Hence, it can be assumed that the supply of toothbrushes and toothpaste would depend largely on the availability of staff and resources in the district and the initiative undertaken by the school health nurses and oral health personnel in their respective districts. Similar findings were also reported in the KwaZulu-Natal Department of Health Annual Report (2011/2) in Section 5.1:80. It was further noted by school 1 that parents did not support the programme. This is probably because parents have to prioritise spending as a result of poverty as noted in challenges in Section 5.2.8.4:120.

Evidently, the tooth brushing programme had to be discontinued once the supplies were finished. Educators' attempts to secure sponsorships was unsuccessful due to businesses houses own financial constraints to donate or continue their community support.

However one quintile 1 school of the total focus group sample described that they had support as demonstrated in the following response:

> *Nurses come almost every week and advise children. Parents assist to a limited extent. Colgate also gave support (10).*

It could be assumed that this district was adequately resourced with school health nurses who did not have many schools to visit.

The availability of funds for the sustainability of programmes was asserted by Petersen and Kwan (2010). All participants in the focus group reported that there was no budget for oral health and that the money that they received from the Department of Education was minimal and it was therefore impossible to fund oral health promotion programmes. Evidence of their responses was as follows:

No budget (4).
No money for oral health (9).
Funding too little therefore not possible (10).
No budget. It would help if we have support (16).

The lack of support and collaboration from the Department of Education for oral health promotion including health promotion was further supported and maintained by the response from the provincial manager (B2) from the Department of Health in Section 5.1:82.

However, three (23%) of the schools did indicate that although there was no support from the Department of Education for oral health they did support the nutrition programme as reported in the following response:

Department of Education support the nutrition programme (16).

Evidence of a lack of funding was also established in responses to the principal's questionnaire as illustrated by the following responses:

We have limited resources and a lack of funds (3).
Lack of funds to buy toothbrushes and toothpaste (15).
No fee school so we therefore have insufficient funds (10).
Department of Health supplied learners with toothbrush, toothpaste, soap and towels. Department of Environmental affairs supplied toothbrush and paste. However there were insufficient funds to sustain the services (12).

The above responses are further corroborated by Peterson and Kwan (2010) who claimed that limited national budgets in countries worldwide impacted on the implementation of integrated health promotion.

Support from the Department of Health was in the form of School Health Services which occurred once or twice a year at most schools in this study. Eleven (85%) of the schools received a little support from the Department of Health while two (15%) had not received any support. The responses from the principal's questionnaire also provided evidence of absence of support as demonstrated in the following responses:

There is very little support from Department of Health. We need state health to do follow ups (9).

Require on-going support from the health department (21).

Insufficient help from the education department and insufficient health visits from school nurses (18).

We need to be visited by nurses at least once a quarter (21).

The Department of Health is not involved with schools (16).

Shortage of school health nurses to support the school (13).

Lack of support from department and community (4).

No support from the Department of Education and Department of Health. If we can get support from the department it will help the children. Getting support from the Department of Health and having nurses to check on the children once a month will help (1).

The above narratives illustrate that although there is some support from the Department of Health it is inadequate. The participants identified the priority of school health services and its benefit to the learners. One participant suggested that visits to the school should be at least once a quarter.

Although there were services offered by the school health nurses, this comprised mainly of screenings and vaccines and minimal on (15%) oral health. Evidence of the consequences of a lack of oral health services is illustrated also in Section 5.2.1:86 where results obtained from the oral health screening demonstrated that 73% of the children examined had caries present.

Responses from provincial and district health managers (100%) indicated that school health nurses lacked expertise and knowledge in oral health promotion, had large areas to render services with high workloads, limited staff and lack of resources. They further recommended an increase in human resources especially oral hygienists. This view is supported in the Department of Health Strategic Plan 2010-2014 (2010: 68-9) proposing an increase in the employment of dental health practitioners.

Evidence of the above statement is exemplified in the following responses from the interviews with managers:

In the absence of dental therapists and oral hygienists the school health nurses promote oral health at the schools but we still need the expertise of the oral hygienist because they have the knowledge (B2).

Oral health activities are not carried out in all schools. It depends on the initiative of the team working in a particular school. It also depends on resources that are available. The load

of the school health team is quite high. They do not have admin support to allow them to reach out for resources. Ideally if you have admin support, for example, take out the directory and look at all the companies that make toothbrushes and toothpaste and get them on board. Human resources being so thin on the ground you can't actually be proactive and do things. The workload is quite high and schools close early. This does not give them enough time to complete their targets. Schools also do not want you to disrupt their programme (C).

It is evident from the above, that the school health nurses require the expertise of the oral health personnel as they lack the expertise in oral health knowledge. Moreover, initiative is a key factor in whether oral health activities are conducted or not. Likewise, manager C also suggested administrative support to assist the school health nurses to attain their targets. Another challenge that the school health nurses encountered was that schools closed early in the day, which prevented them in completing their allocated tasks. Furthermore, schools did not welcome many disruptions to their programmes because they were accountable to the Department of Education for time lost.

The dire need for oral health personnel is further demonstrated in the following responses:

The biggest obstacle is the availability of oral health personnel, although the school nurses are orientated into oral health and examine the learners they either miss some oral health problems or over refer clients to dental clinic. At the moment in my district the oral hygienist has resigned. Oral hygienists are hospital based doing more curative and rehabilitative treatment therefore preventive programmes usually do not receive recognition for prioritization when funds are allocated. (D).

There are an inadequate number of oral hygienists. 4 hygienists to cover 510 schools is insufficient (E).

Number one barrier is the absence of oral hygienists to provide preventive services to the six year olds (F).

Clearly, more oral hygienists would need to be employed to conduct preventive work. This creates a challenge since, currently only five hygienists are enrolled each year in the two year oral hygiene programme at the University of KwaZulu-Natal. However, plans are underway to increase the training to three years and enrolment to thirty students. Furthermore, the vast majority of oral health personnel are employed by the private sector as there are no posts available in the public sector which further compounds the problem (Department of Health, 2003b). Evidence of the lack of oral hygienists was also noted in Section 5.2.3:98. This further demonstrates that oral health services are not suitably aligned in the public sector.

In lieu of the problems stated above, the Department of Health should consider a more integrated programme for oral health service delivery. Initiatives for health should include oral health promotion by giving due consideration to the common risk factor approach.

In the interim, for the sustainability of oral health promotion interventions educator/school personnel would need to have the knowledge to continue with the programme in the absence of school health nurses and oral health personnel. It was evident that health promotion training for school staff was not present in the majority (61.9%) of the schools. This was further emphasized as a difficulty by the district managers. Staff indicated that they lacked basic knowledge in oral health which resulted in a lack of confidence in the implementation of oral health promotion programmes. The following demonstrates the training that staff receives:

> *Yes they attend workshops. After attending the workshops they do what they were taught at the workshops. More workshops required (1).*
> *Yes attend life skills workshops organised by the department (6).*
> *Yes by nurses and the oral hygienist, the sister department that fit us in her/his programme that time. Curriculum is changing, not enough time for training; therefore there is poor implementation because educators are not 100% sure. The subject advisors are not sure of what they are doing. (7).*
> *Training is not properly provided (13).*
> *Yes, some of the activities are provided to teachers, person who attended the workshop need to cascade the information to teachers. They feel comfortable but not competent enough – we still need more information and adequate training about this health education (14).*
> *Some training needed not all (23).*
> *No training for staff* (16).
> *No workshops from Department of Health and Department of Education. Teachers attend in personal capacity (5).*

Evidently, some educators do attend workshops but participants felt that this was inadequate. The responses further specify that although educators attend some workshops it is not necessarily in oral health promotion. In addition, training from the oral hygienist would depend on whether they are based at clinics close to the school and have the time to conduct these workshops. It was encouraging that educators took the initiative to attend workshops in their personal capacity where there were no workshops provided. It was further noted that some of the schools from rural areas that required the training, did not receive it. This further indicates the inequalities and different practices that existed between the various districts.

The high dental caries rates among children in South Africa has been emphasised (Singh, 2011, National Department of Health and all Oral Health Stakeholders, 2010). Results in this study as demonstrated in Section 5.2.1:86 also indicate a high caries rate among the learners at the selected schools in the study. The school environment provides an excellent space for learners who are at high risk for dental diseases to gain access to oral health services (Kwan et al., 2005, World Health Organization, 2003b).

Managers were also questioned about their awareness of oral diseases being a particular problem in their local areas (Appendix 1). Managers did identify that dental caries as a problem and advocated that educators needed to be informed about oral diseases so that they could identify oral health problems in learners at an early stage as evidenced in the following responses:

> *Decay is high. Oral diseases can be picked up – staff need to be trained – looking at mouth – can pick up a lot of diseases. The staff also needs training with regard to this (B2).*
> *Staff should receive training on oral health through the Oral Hygienist. This would up the skill of teachers e.g.to keep the toothbrushes heads not touching each other by using a 2 litre plastic bottle as a toothbrush holder (D).*
> *Oral disease is a problem. I think that in some areas it is quite serious. It is better in those schools that have a tooth brushing programme. It is worse off in the quintile 1 & 2 schools. I think what aggravates it is the lack of clean safe water. At least where there are tooth brushing programmes, educators can assist learners on the correct way of brushing and impress upon them the correct way of brushing (C).*

They further identified the necessity of tooth brushing programmes at schools to address this problem.

Support from parents was fundamental for the success and sustainability of an intervention. A major challenge for oral health interventions encountered by the educators was support from parents as demonstrated in the following responses:

> *Parents are 'lazy' to provide children with a healthy lunch box – instead give money to purchase food (18).*
> *There is a lack of interest and support from the parents (6).*
> *Parents are not co-operative they do not supply tooth brushes and toothpaste (1).*
> *Require greater buy-in from parents (11).*

Educators from schools 2, 3, 15 and 18 shared similar thoughts to educators from school 6. The lack of support from parents will ultimately affect sustainability of intervention programmes. Some

reasons could be attributed to a lack of knowledge and affordability as validated in Section 5.2.8.4:120. Further exploratory studies need to be conducted to investigate sustained parental involvement.

The availability of adequate resources invariably impact on the success and sustainability of an intervention.

5.3.2 Resources

All schools (100%) in the focus group discussions identified the availability of one or the other resources as a barrier or challenge to the success of the programme. Access to water, which was highlighted by five (38%) of the schools, was found to be a major barrier to the implementation and success of the oral health promotion intervention. This is demonstrated by the following responses:

> *It is difficult for learners to do tooth brushing at school because we do not have running water. Children go behind the classrooms as the facilities are not adequate (1).*
> *We have limited taps (9).*
> *There are not many taps and classes are large (4).*
> *We have no water during winter so it becomes a problem to conduct the programme. Water that the children bring from home is for cooking and washing their hands – not for tooth brushing (6).*
> *Some days there is no water so the programme cannot be done on those days (16).*

The narratives above specify that the availability of tap water continues to be a problem in some districts. This is further validated by the statistics obtained from Co-Operative Governance and Traditional Affairs (2013) which indicated that water was still a problem in the Umkhanyakude, Sisonke and Umzinyathi districts as reported also in Section 5.2.2:95 of this study. Evidence of the shortage of water in the Sisonke district was also brought to the attention of the researcher on her visit to a school in the Sisonke district where it was conveyed by educators that children had to walk 5 kilometres to the river each day to fetch water, when there was no rain. This had ramifications on learners missing valuable time at school.

Another challenge encountered by the schools in terms of resources for oral health interventions was the lack of basins and glasses or cups for rinsing as evident from the following narratives:

> *We should have glasses available for learners to rinse their mouths. There are not enough glasses – only some learners bring glasses (15).*

Learners have to share cups (21).
There is only one basin to forty learners (18).

These responses demonstrate that schools still lacked appropriate sanitation facilities. As a result of the limited basins and taps at certain schools, learners often would make a mess, which will thereafter have to be cleaned, resulting in the wastage of time.

Another key challenge for the tooth brushing programme that was encountered by the educators was the supply of tooth brushes and paste together with the hygienic storage of tooth brushes at school. Substantiating these challenges is demonstrated in the following responses:

There are no sponsors to supply tooth brushes and toothpaste. Supplies are finished therefore we cannot continue with the programme. Need a regular supply of toothbrushes and toothpaste (2).
When the tooth brushes and toothpaste are finished there is no programme (16).
It is a challenge to store the toothbrushes hygienically. Look at storage of toothbrushes because classes are overcrowded and we do not have enough space.
Need caps or cups for toothbrushes (9).
To get them to brush their teeth is good but we do not have enough resources (17).
No adequate taps – tooth brushing programme could not happen on a regular basis – just demonstrated to the children (18).

Similar responses were also recorded in the other schools. It is evident from the narratives above that when supplies were depleted the programme came to a halt. This is also validated by earlier responses in Section 5.3.1:123. Many of the participants complained about the challenge they encountered with the hygienic storage of the toothbrushes especially in the larger classes.

Some educators attempted to improvise with resources that they had and in addition made the following suggestions to assist with these encounters:

We need to instil the buying of tooth brushes and toothpaste to parents (6).
We should look at a rack to store the brushes hygienically (11).
Would prefer containers with lids – need to ask parents to buy them (16).

Although educators recommended purchasing of toothbrushes and paste by the parents this would pose a difficulty in poverty stricken areas where parents did not prioritise the buying of tooth brushes and paste as this was a luxury they could ill afford. This is also illustrated in Section 5.2.8.4:120. In

addition, some parents depended largely on social grants as an income as illustrated in the following statement:

> *Most parents are grandparents who depend on pensions or grants (7).*

If toothbrushes were indeed stored together, labelling and distributing the tooth brushes would become cumbersome as demonstrated by the following responses:

> *There are a large number of learners therefore the distribution of the tooth brushes takes time. Also the placement of toothpaste on so many brushes takes time (9).*
> *Distribution of tooth brushes was a problem – had to label them (11).*

This exercise demonstrably impacted on the teaching time of learners which was reiterated as a challenge by schools 2, 4, 8 and 11 in Section 5.2.7.1:110-11.

It was alarming that from 12 (92%) out of the 13 schools, learners did not brush their teeth at home as they did not possess toothbrushes and paste. Evidence of this is verified in the following responses:

> *Some children don't have toothbrushes at home and only do tooth brushing at school (1).*
> *Some of the learners were happy because they don't have toothbrushes and toothpaste at home (2).*
> *Yes some learners don't brush their teeth – have no toothbrushes so they are able to do it at school (4).*
> *It is in their culture – don't brush their teeth (6).*
> *Our students come from rural areas and it was noted that they had no exposure to tooth brushing (9).*
> *Children not brushing at home so programme at school helped (11).*
> *For some of the learners brushing is only done at school. Some learners never saw a toothbrush (16).*
> *Learners don't brush at home. They go back home and ask their parents why they don't brush at home (21).*

Again, this was probably due to a lack of knowledge and affordability. Evidence of this is reflected in the following responses:

> *Community has a limited understanding. No water. Parents don't co-operate in terms of implementation. Need to educate them with campaigns. They are illiterate. They are also poverty stricken. There is a lack of co-operation, understanding and education (6).*

There is poverty and unemployment (12).

Similar thoughts were also advanced by other schools.

Although the educators faced many challenges they identified the benefits of the availability of the toothbrushes and paste at school as noted in the ensuing responses:

Health wise the children have benefitted. They used to come with smelly mouths and yellowish teeth. The tooth brushing programme has made a great difference (2).
We can monitor learners at school with their tooth brushing as parents leave early to work so children forget to brush their teeth (4).
Less number of learners now complains of toothache (10).
Noticed since they started brushing their teeth – they are beautiful – can see the improvement – no more smelly mouths (15).

Despite these pervasive intervention sustainability challenges, awareness was created.

5.4 Strengths and Limitations of the Study

5.4.1 The Conceptual Framework

To achieve the desired results in oral health service delivery, interventions would have to be evidence-based, appropriate, timely and of high quality. Efficient and effective oral health planning could result in a more successful and sustainable oral health service delivery (Lee et al., 2005, Petersen and Kwan, 2004). The framework used to guide this study provided a systematic and negotiated approach to the planning, implementation and review of the oral health promotion intervention to achieve the desired goals in an appropriate period of time. The 'efficient' indicators for this framework is short term goals and the 'effective' indicators of this framework includes medium and long term goals to evaluate whether the oral health promotion intervention is achieving the expected or desired outcomes within the timeframe of identified goals. Process evaluation investigated how well the planned intervention had been implemented. It also identified the factors that facilitated or impeded the implementation. The framework also provides a multi-level approach for oral health care delivery that includes macro, meso and micro influences. The framework identifies critical areas for assessment for those involved in planning and implementing integrated school health programmes. Potential target areas for oral health promotion interventions were also identified. For sustainability, processes that advocate and encourage social cohesion, partnership development and resource sharing are also identified. This

framework has been tested and therefore hopes to inform future integrated oral health service delivery approaches.

5.4.1.1 Strengths of the Framework

The multiple components of the framework provided a theoretical basis for programme planning. The framework comprised of three phases namely assessment, implementation and review. The assessment phase comprised of an administrative and policy assessment and a situational analysis. This facilitated the identification of resources and barriers to the programme. The situational analysis informed the researcher on learners' oral health needs, gaps in health and oral health service delivery and the health and oral health services required. The programme implemented in Phase 2 was informed by data obtained in Phase 1 of the study. The oral health promotion programme was planned prior to its implementation taking into consideration goals, resources, infrastructure, service delivery and unmet oral health needs. Behavioural and environmental factors were taken into consideration such as the availability of water and oral health practices of learners. Planning also included stakeholder involvement. The implementation of a tooth brushing programme was necessary to identify gaps in programme implementation. The educators were asked to monitor and maintain the programme. For the purposes of this study only the short term goals were assessed in Phase 3 of the study for awareness, feasibility and availability of resources. This framework however provides for the assessment of medium and long term goals.

The design of this framework with its multiple components could be adapted to other settings. The assessment and planning and implementation and review phase that focuses on policies, situational analysis, administration, stakeholders, monitoring and maintenance and the setting of goals. More research needs to be done on frameworks for school-based oral health preventive and promotive programmes.

The framework was informed by evidence-based practice using various theories. This was therefore aligned to international and locally accepted strategies (Department of Health, 2010a, Green, 2000). This programme was therefore aligned to the Department of Health-KwaZulu-Natal strategies in oral health (Department of Health, 2010a). This was imperative because the researcher wanted to ensure sustainability in programme implementation as these programmes needed to be supported by the local health system.

The evaluation component of this framework included the perspectives of stakeholders. The focus of previous evaluation frameworks was mainly on quantitative data with exclusion on the opinions and perceptions of the stakeholders. Stakeholders informed this study on the strengths, limitations and

barriers to the implemented programme. The inclusion of stakeholder perspectives is therefore important to inform modifications to the programme.

5.4.1.2 Limitations of framework

Although this framework provides opportunities for the incorporation of oral health promotion within the Health Promoting School Initiative, there are some limitations. The model was not tested for effectiveness to assess behaviour change. This is a final outcome evaluation which is complex and therefore costly. Furthermore, the cost-effectiveness of this intervention was not investigated. The framework does not account for costs in terms of resources, funding, time and personnel. Therefore more research would have to be done to evaluate the cost-effectiveness of this approach.

A barrier to the implementation of this framework would be the personal beliefs and values of school principals and commitment from staff (Lynagh et al., 1999). Further evidence-based practice requires the expertise of the school community. They would therefore require knowledge in the most effective strategies to use for interventions. However, a lack of access to empirical research would mean that the school community would not be able to use evidence-based practice (Treno and Holder, 1997). Moreover, to obtain substantial health and educational gains, political and financial commitment would be needed from the various decision makers (Deschesnes et al., 2003).

5.4.2 The Integrated Oral Health Promotion Programme

5.4.2.1 Limitations to the Programme

The Health Promoting School Initiative was chosen because the literature indicates that it provides a supportive environment to improve health (St. Leger, 1999). However, there were barriers present for the successful integration of oral health promotion into this initiative. Although health promotion is prioritised in the school curriculum at Health Promoting Schools, findings in this study indicated a lack of evidence of oral health promotion initiatives integrated into health promotion or a subject on its own. Educators also noted that they were restricted to what was prescribed in the curriculum and therefore found it difficult to include oral health promotion as suggested by the researcher. Additionally, almost 70% of study participants (educators) lacked knowledge and skills in oral health promotion. This resulted in a lack of confidence in the implementation of the programme. The study findings also noted a lack of in-service training provided in oral health promotion to educators. These factors therefore impacted on the integration of oral health promotion into the school programme.

It was further noted that if oral health promotion activities such as tooth brushing and fluoride rinses are included in the school programme this would have implications in terms of time management for

educators as these activities encroached upon their teaching time. Sustainability of these activities was also a problem as a result of a lack of resources and funding. The study findings further indicated that there was a lack of support in terms of funding for oral health promotion activities from the Department of Education. The memorandum of understanding signed between the school principals and researcher specified that the school participants were ultimately responsible for the maintenance of the programme. This therefore required them to identify resources to maintain the programme. However, research findings in this study indicated that educators did not have the time to identify resources. Additionally, there was a lack of administrative support. Collaborative efforts with the business sector were also not possible due to them experiencing their own financial constraints. It must be noted that there are other more acceptable cost effective alternatives to tooth brushing, such as tooth sticks, which can be identified and readily available in the local community (Bos, 1993). The effectiveness of the tooth stick in removing plaque is the same as tooth brushing and would be cost free if found locally (Sote, 1987, Wu et al., 2001). More research would have to be done in KwaZulu-Natal to identify the availability of the tooth stick as a cost free alternative to tooth brushing in the disadvantaged areas.

One of the outcomes from the discussion above was that the programme was not sustainable because of funding. However, a lack of resources, knowledge and supporting structures were also critical factors for sustainability. This therefore requires capacity building of schools (Heward et al., 2007). This concept entails developing essential prerequisites such as capacity building prior to or in conjunction with strategies such as the Health Promoting School Initiative to ensure success and sustainability of health and oral health promotion interventions (Smith et al., 2006, Crisp et al., 2000).

The barriers identified in this study were similar to evidence provided in literature internationally and in South Africa that dates back more than ten years (Mohlabi et al., 2010, Swart and Reddy, 1999, Vergnani et al., 1998, Resnicow et al., 1993, Coonan et al., 1990). This implies that although South Africa has adopted international strategies such as the Health Promoting School Initiative, national and provincial government have not provided the necessary resources to sustain these programmes. This therefore suggests that a universal programme cannot be introduced as a strategy for health and oral health promotion. However, the responsibility of health and oral health promotion should not be the responsibility of the Department of Health alone but should include each individual, community and other stakeholders. A multilayered approach to health and oral health promotion using a greater mix of available strategies should therefore be considered from district to district (Watt, 2007, Watt, 2002). The importance of the social context in oral health promotion activities, that has been informed by evidence-based health promotion practice, should also be considered (Singh, 2012).

Therefore reorganisation in all settings including the health system, communities and schools is imperative. To improve the health system, attention needs to be given to skills development, improving organisational structures, ensuring the availability of resources, and the development of policies and partnerships (Riddle and Clark, 2011, Heward et al., 2007). A multidisciplinary approach should also be considered in the development of an oral health promotion intervention (Riddle and Clark, 2011). An understanding of what is available at a district level is imperative for the success of an intervention. This would therefore include information on available oral health skills, knowledge, commitment from stakeholders and specific needs of the identified population (Petersen, 2004a). Current reports from the Department of Health indicate a roll out plan for school-based interventions (Department of Health - KwaZulu-Natal, 2012). This suggests that a multilayered approach has not been adopted. Therefore an intervention planning model as illustrated in Figure 5.3 would have to be developed for a systematic approach to integrated oral health promotion delivery.

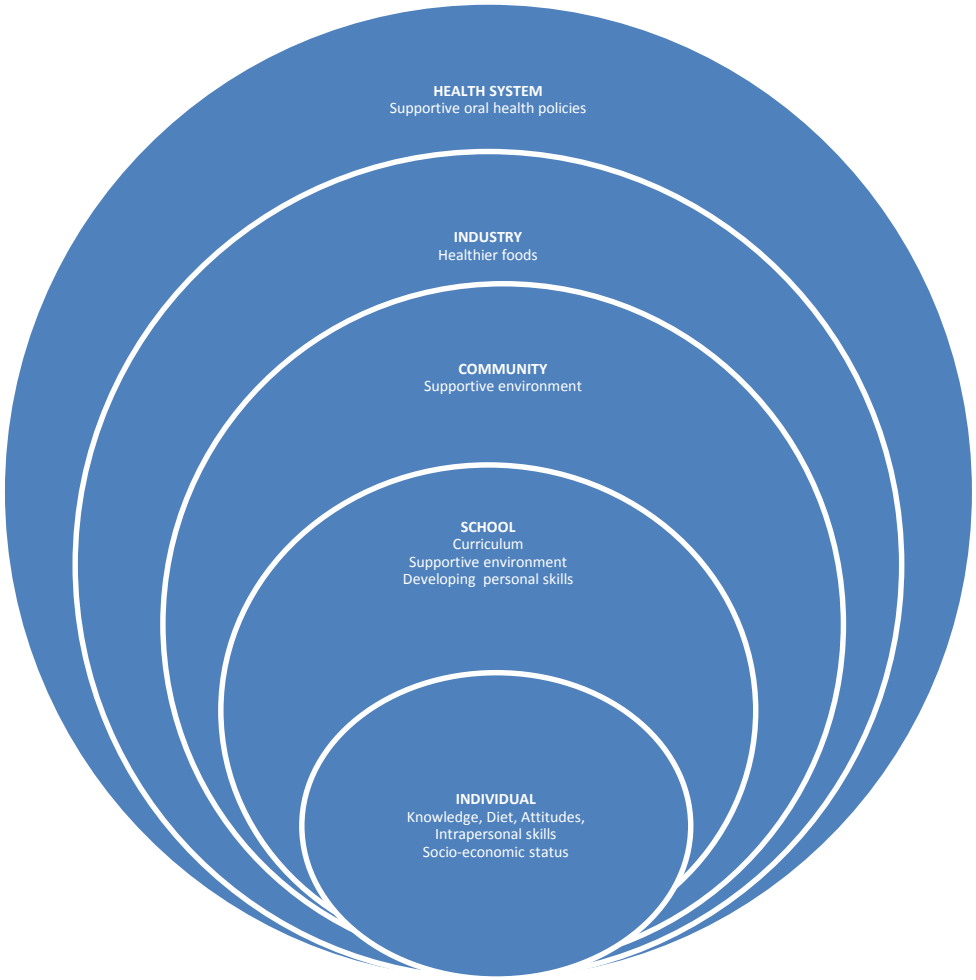

Figure: 5.3 Intervention Planning Model
Source: Adapted Riddle, M & Clark, D (2011); Singh, S (2012)

Oral health promotion is not only the responsibility of the health system but should involve the collective accountability of all stakeholders. An example of this in the context of this study and the setting of the Health Promoting School would be strategies to address the varied caries prevalence between schools. The carious process is dependent on many factors that could be targeted for preventive strategies. The individual level (microlevel) could be the ability of the learner to make healthier choices and adopt healthier behaviours. The school level (mesolevel) could include supportive policies for health, oral health and healthy eating, education on healthy dietary practice, providing supportive environments such as ensuring the sale of healthy foods at tuck shops and by vendors and the development of skills (Meko et al., 2015). The mesolevel could also include the surrounding community and industry. The community could advocate for a supportive environment by ensuring the sale of healthier foods, especially in the area surrounding the schools, and for fluoride exposure. Industry could ensure the production and sale of healthier foods. The health system is at the macrolevel which could ensure supportive policies for oral health promotion. Support could include nutritional policies (national and school level), the provision of appropriate oral health personnel, skills development and the provision of adequate resources and infrastructure. This support could be provided at a national (macrolevel) and at a district (mesolevel) (Singh, 2012, Riddle and Clark, 2011).

Findings in this study further indicated that priority is not being given to oral health promotion although an integrated approach to health promotion has been advocated (Department of Health, 2010a). It seems that priority is also not given to primary teeth as there is a lack of evidence in the literature on implemented school-based programmes in KwaZulu-Natal. Moreover, there is a lack of funding, resources and oral health personnel employed in the public sector for these programmes to be conducted (Department of Health - KwaZulu-Natal, 2012). Oral health stakeholders need to address this issue by motivating for funding for preventive programmes and resources and the employment of relevant oral health personnel. However, this poses a problem in KwaZulu-Natal. Due to the high burden of other general diseases, oral health is not high on the list of priorities for funding in this province although it has been identified as a significant government priority in South Africa.

The six year old learners that formed part of the study sample were not interviewed in this study for their perspectives on oral health and the implemented programme. There is also a need for greater community engagement specifically in terms of dietary intake and sale of food. School participants experienced difficulty controlling what was being sold, especially by vendors and shops in their immediate vicinity. One of the problems noted was that healthy foods such as fruit were perishable and therefore were not popular. Moreover, they were expensive and therefore unaffordable to learners especially in the rural areas. More research is required in this aspect.

A limitation for the dental examination on six year old learners was that the permanent teeth were present for a short period of time in the mouth and were therefore not exposed to caries risk factors such as sugars and poor oral hygiene for long.

The purpose of this study was to measure the short term feasibility of the programme and not to provide service delivery. However, evidence in the literature suggests that one of the goals of evaluative research is to corroborate the effectiveness of programmes to guide action and substantiate the energy and resources devoted to them (Deschesnes et al., 2003). It was therefore imperative to provide evidence that implemented programmes could be integrated into the school programme. Therefore support had to be provided for the implementation of this programme. It was noted from data obtained in Phase 1 of the study that the majority of the learners (80%), especially in the rural areas did not brush their teeth at home. The researcher was also of the opinion that the learners should be rewarded for partaking in this programme. Colgate World of Care had formed a partnership with the Department of Health and the Department of Basic Education to provide learners with tooth brushes and tooth paste. With the availability of this resource the researcher then decided to introduce a tooth brushing programme at the identified schools in the study to establish its feasibility. Due to the vast geographical area involved in the study, the tooth brushing programme could not be monitored by the researcher. However the researcher noted that a number of educators (46%) were motivated and therefore took ownership of the programme. Therefore a key individual that was motivated and interested to take responsibility was identified to monitor the programme. This could have resulted in over reporting in terms of compliance. It was recommended that these individuals be given time and their capacity developed to monitor the oral health promotion activities. True effectiveness and impact on behaviour occurs over a long period of time. This intervention would have to occur over a long period of time to determine effectiveness and impact on oral health. This was therefore not possible in this study,

5.4.2.2 Benefits of the Programme

Although there were many limitations to this programme some benefits were identified.
All (100%) participants identified the importance of the inclusion of oral health promotion into the curriculum, especially in rural areas. This would assist them with time management, accountability and the provision of learning material. Educators mentioned that some children had no parents. As a result they received no guidance on health and oral health issues. Oral health promotion programmes at school would therefore enable them to make informed decisions about their oral health.

Educators at two schools (15%) were of the opinion that oral health education should be reinforced in the curriculum by introducing examples and activities. This would assist them in implementing the

programme and ensuring its sustainability. Educators (46%) also felt that this programme was of benefit to them as it had created awareness to oral health. This therefore empowered educators to take control of the programme by creating awareness to the importance of oral health and providing guidance on the implementation of the programme. One educator implemented a healthy lunch policy in her class in consultation with the parents. She found that with the absence of sugary snacks the learners were now more attentive and easier to control in class. This would also assist in the reduction of caries. This strategy was in line with the common risk factor approach.

All (100%) focus group participants indicated that this programme had created awareness to oral health for their learners. Learners benefitted from the programme because they now knew the importance of brushing their teeth and the frequency of brushing. This programme also assisted them by improving their skills in tooth brushing. Educators further indicated that learners did not have halitosis and yellowish teeth after the implementation of the programme. Learners were also now more aware of the impact of sugary snacks on their teeth. Educators were also of the opinion that the complaints of toothache had decreased.

Parents also benefitted from this programme through the learners. Learners made their parents more aware of the importance of brushing their teeth and reminded them to brush their teeth. Parents also expressed their appreciation of the programme at school meetings.

As illustrated in Section 5.4.2.1:138, there were many barriers experienced with trying to change to the sale of healthier foods. However, a benefit achieved with this programme was the creation of awareness for educators of the impact of sugary snacks on teeth. This therefore provided educators with the knowledge to try and ensure a positive change in the sale of healthier snacks at schools.

5.4.3 Adaptation of model to Traditional Schools

There are very few accredited Health Promoting Schools in KwaZulu-Natal. Therefore it is important to establish whether this framework could work in Traditional Schools so that more learners could be reached for health and oral health promotion interventions. Although it would be easier to use the Health Promoting School as a platform for health and oral health promotion interventions it is the sentiment of the researcher that this framework could also be adapted to the traditional schools as similar barriers and limitations prevail at these schools. From observations made by the researcher at visits to the Health Promoting Schools, the success of school-based interventions is very dependent on buy-in from the school principal and staff. The attitudes of the principal and staff will depend on whether they take ownership of the programme and ensure its sustainability. If the mind sets of principals and staff can be changed then it is possible to introduce health and oral health promotion

interventions. Therefore, if staff at these schools are motivated towards health and oral health promotion and understand its value and the impact that it could have on the health of their learners, they will take ownership of the programme. However, for this to be successful the capacity of the school community would have to be developed.

The next chapter presents the manuscripts that emanated from this study.

CHAPTER 6

MANUSCRIPTS

This chapter presents two publications and one manuscript.

1. Reddy, M., Singh, S. Viability in delivering oral health promotion activities within the Health Promoting Schools Initiative in KwaZulu-Natal. South African Journal of Child Health 2015; 9(3):93-97.

2. Reddy, M., Singh, S. Dental caries status in six-year-old children at Health Promoting Schools in KwaZulu-Natal, South Africa. South African Dental Journal 2015; 70(9):396-401

3. Reddy, M. Singh, S. The promotion of oral health within the Health Promoting Schools in KwaZulu-Natal. **(Submitted for review in the South African Journal of Child Health)**

6.1 Manuscript 1

Viability in delivering oral health promotion activities within the Health Promoting Schools Initiative in KwaZulu-Natal

This manuscript, which has been published in the South African Journal Child Health (2015), was developed from the situational analysis conducted in the first phase of the study to understand the contextualised delivery of oral health service provision within the Health Promoting School. This manuscript reports on the policy document review, situational analysis and priorities for health and oral health promotion. It addresses objectives 1 and part of object 2 of the study which is to identify current policies or priorities for health promotion and oral health promotion and to conduct a situational analysis of existing services provided at these schools.

Viability in delivering oral health promotion activities within the Health Promoting Schools Initiative in KwaZulu-Natal

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This work is part of a larger study conducted in fulfilment of the first author's PhD degree in Health Sciences, University of KwaZulu-Natal.

Background. The Health Promoting Schools Initiative can provide a platform to explore integration of oral health promotion activities within the broader context of healthcare delivery.
Objectives. To understand the contextualised delivery of oral health service provision within Health Promoting Schools, to conduct a situational analysis of existing services provided at these schools and to review current health and education policies.
Methods. The explorative study design used a mixed methods approach. Twenty-three schools of a total sample of 154 were selected using multistage cluster sampling. Data collection comprised policy reviews, a self-administered questionnaire, a data capture sheet and an interview schedule. The study was approved by the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (HSS/0509/013D).
Results. Although policies included statements on oral health promotion, this was not translated into practice at school level. Barriers and challenges identified for successful implementation of an oral health promotion programme included lack of funds, human resources, knowledge and ownership, as well as high workloads and time constraints.
Conclusion. Current delivery of oral health promotion services within the Health Promoting Schools Initiative will not reap the desired oral health outcomes owing to the inherent mismatch between policy planning and implementation. More research needs to be conducted to address opportunities and challenges facing educators and other oral healthcare providers working in the school environment.

S Afr J Child Health 2015;9(3):93-97. DOI:10.7196/SAJCH.7944

The Health Promoting Schools Initiative is recognised as a viable platform to provide integrated and comprehensive oral healthcare.[1] This approach differs from traditional school-based settings in that greater accountability is placed on supportive environments, development of school-based policies, community participation, and focus on disease prevention and promotion of healthier lifestyles.[1] The initiative can provide a platform to explore integration of oral health promotion activities within the broader context of healthcare delivery. Oral healthcare should be seen as an essential part of general health. Interventions could include promotion of a healthy diet, oral health education, tobacco cessation, safe water and sanitation, water fluoridation, tooth brushing and fluoride rinsing programmes.[2]

Schools in South Africa (SA) are graded according to quintiles, which range from quintile 1 (the poorest) to quintile 5 (least poor). Presently, school health services give greater priority to quintile 1 and 2 schools.[3] The literature suggests an inequitable distribution of school health services in KwaZulu-Natal.[3] This could be due to multiple factors that include shortage of personnel, transport and equipment.[3,4] These challenges are more prevalent in rural communities and, given the burden of oral diseases and huge unmet oral health need, these problems are further compounded by access and availability of health services.[5] School oral health promotion programmes currently in place are inconsistent, inequitably distributed and lack monitoring and evaluation.[5]

There are over 1 000 Health Promoting Schools that have been established in SA since 1999.[6-8] However very little research has been done to assess the progress of this initiative, specifically in relation to oral health promotion in KwaZulu-Natal.

International experience indicates the importance of conducting a needs analysis prior to the implementation of health programmes. Understanding of the system's capacity (in this case the school) to support programme implementation – in terms of resources, budgetary allocations, inclusive decision-making and monitoring and evaluation – will contribute to the programme's sustainability.

A needs analysis could include sociodemographic profile, socioeconomic status, health and oral health status, availability of dental and school health services, nutritional status, infrastructure, available resources, funding and evidence of community participation.

This presentation is part of a bigger project that examines the viability of integrating oral health promotion activities within the Health Promoting Schools Initiative. This article reports only on the current capacity of Health Promoting Schools to support oral health promotion in KwaZulu-Natal.

Objectives

To understand the contextualised delivery of oral health service provision within Health Promoting Schools, to conduct a situational analysis of existing services provided at these schools, and to review current health and education policies.

Methods

The explorative study design used a mixed methods approach, with a combination of qualitative and quantitative data. Data source triangulation was used to combine evidence from multiple data sources. A structured self-administered questionnaire, data capture sheet and interview schedule were used to collect data. Policies were

also reviewed for identification of current policy priorities in health and oral health promotion.

There are 154 primary Health Promoting Schools in KwaZulu-Natal. Twenty-three schools were selected from the 11 districts using multistage cluster sampling. Schools were selected according to districts and then quintiles. The study sample (n=23) comprised two or three schools from each district and four or five from each quintile.

The sample population for the interview phase comprised the Basic Education manager involved with health promotion, and the provincial and district (eThekweni, Ugu, iLembe and Uthukela) health promotion managers from the Department of Health. These participants were selected using purposeful random sampling.

The self-administered questionnaire, which focused on oral health promotion, school health services, community relationships and collaboration, and barriers and challenges experienced, was completed by school principals. Fieldworkers involved in data collection observed and recorded the school's physical and environmental condition on a data capturing sheet. The interview schedule included questions on the importance and awareness of oral health promotion at schools, and opportunities and challenges facing integration of oral health promotion services.

A pilot study was conducted to pretest the questionnaire at two schools not included in the study, prior to commencement of data collection.

Validity was maintained by ensuring that the questionnaire and interview focused on the study's objectives. Reliability was ensured by standardising the use of codes and identified themes.

Gatekeeper permission was obtained from Department of Health and Department of Education. The study was approved by the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (HSS/0509/013D). The University of KwaZulu-Natal ethical guidelines were used to ensure confidentiality, consent to conduct interviews and proper data management.

Results

The results of the study are a combination of quantitative and qualitative data, and are presented to address the objectives of the study.

Policy document review

Table 1 presents the list of policies and documents that were reviewed.

The Youth and Adolescent Policy[12] and Integrated School Health Policy[4] identified the need to improve and strengthen existing school health services. However, there was no direct mention of oral health promotion in these policy statements.

The SA National Oral Health Strategy (2004)[9] and Draft National Oral Health Strategy (2010)[10] prioritised the improvement of oral health for all citizens through oral health promotion. School screenings for oral health were mentioned in the School Health Policy and Implementation Guidelines[3] and Integrated School Health Policy.[4]

However, reports from interviews with managers indicated a lack of priority given to oral health, as reflected in the following quotation: 'There is awareness to [sic] basic hygiene being included in the curriculum but not oral health' (interview with Manager A).

Managers did, however, identify the need to give priority to oral health promotion: 'Oral health promotion was identified as a critical gap in the Health Promoting Schools Initiative and it is vital that it be part of the health promotion programme so that it would enable children to take care of their teeth and prevent long-term oral health problems' (interview with Manager C).

Responses to the questionnaire for school principals indicated that five schools (21.8%) had comprehensive oral health policies in place but only one school provided supporting evidence.

Situational analysis

The majority (60.9%) of schools in the study sample (n=23) were located in rural areas, 26.1% (n=6) in peri-urban areas and only 13% (n=3) were located in urban areas. An assessment of the condition and environment of the schools is outlined in Table 2.

All respondents (n=14) (Table 2) in the rural areas and 89% of respondents in the urban and peri-urban areas reported that health messages formed part of the curriculum. Water supply and safety in the urban and peri-urban areas was reported as good (100%) compared with rural water supply and safety (64.3%). Most respondents in the rural areas (78.6%) and 44.4% in the urban and peri-urban areas reported that recycling was inadequate. Playground conditions in the rural areas were reported as inadequate (57%) compared with 33.3% inadequate in the urban/peri-urban areas. Only 50% of the

Table 1. Policy and priorities

Document	Priorities
National Oral Health Strategy (2004)[9] National Oral Health Strategy (Draft: 2010)[10]	*Interventions* Primary prevention and promotion, integrated approach, common risk factors *Resources required* Oral health personnel, physical facilities, funding, transport
KwaZulu-Natal Department of Health Vote 7 Annual Report 2011/2012[11]	*Interventions* School-based preventive and promotive oral health programme *Resources required* Oral health personnel, facilities, equipment
Policy Guidelines for Youth and Adolescent Health (2001)[12]	*Interventions* Primary prevention and promotion, integrated approach, common risk factors School health services
Department of Health Strategic Plan 2010 - 2014 (2010)[13]	*Interventions* Primary prevention and promotion, integrated approach, common risk factors *Resources required* Human resources, funding, staff accommodation
School Health Policy and Implementation Guidelines (2011)[3]	*Interventions* Primary prevention and promotion, integrated approach, common risk factors School screenings for oral health *Resources required* Nursing personnel for school health services
Integrated School Health Policy (2012)[4]	*Interventions* Primary prevention and promotion, integrated approach, common risk factors School health services Screenings for oral health

Table 2. Conditions and environment of the schools

	Rural (n=14), %		Urban/peri-urban (n=9), %		
	Poor	Good	Poor	Good	p-value
Sanitation or toilet condition or number	50.0	50.0	22.2	77.8	0.677
Water supply and safety	35.7	64.3	0	100	0.043
Refuse disposal: type/bins	50.0	50.0	11.0	89.0	0.148
Recycling programme in place	78.6	21.4	44.4	55.6	0.005
Health messages form part of the curriculum content	0	100	11.0	89.0	0.130
Playground conditions	57.0	43.0	33.3	66.7	0.266

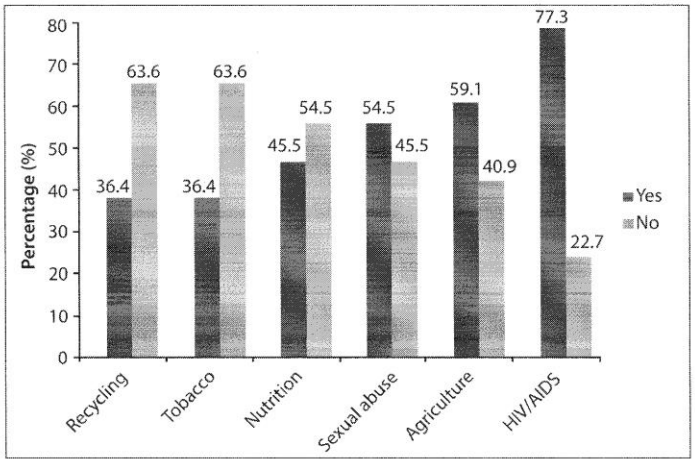

Fig. 1. Community activities.

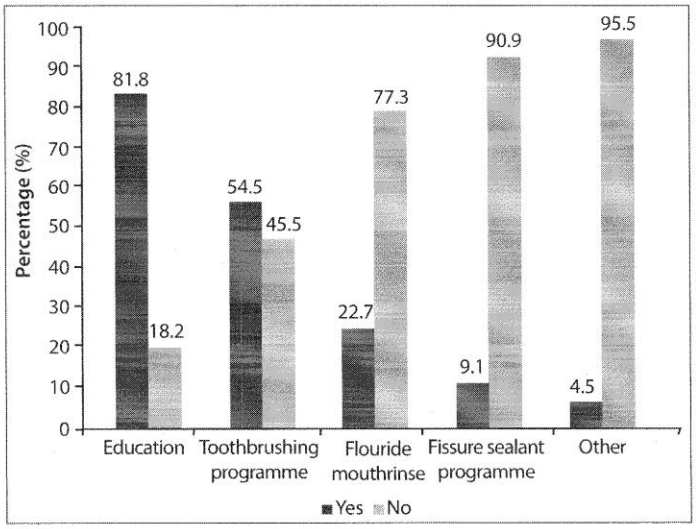

Fig. 2. Oral health services.

respondents in the rural areas reported that sanitation and the condition or number of the toilets was fine. Seven respondents (77.8%) in the urban/peri-urban areas were satisfied with sanitation and availability of toilets.

All respondents indicated that 71.4% of the schools had clinics in close proximity to the schools, while 57.1% indicated that hospitals and police stations were located within a 30 km radius. Recreational facilities such as sporting activities were not easily accessible to 71.4% of the schools. Respondents from the rural areas also reported that road conditions were poor and transport and resources limited.

Eighty-seven per cent of respondents reported that School Health Services and screenings were provided annually by the Department of Health. Supporting evidence was provided in the school visitors log book.

Responses from interviews with provincial and district health managers (100%) indicated that school health nurses lacked expertise and knowledge in oral health promotion, had large areas to support, and had high workloads and limited staff and resources. Respondents also stated that there should be an increase in human resources, especially oral hygienists. The Department of Health Strategic Plan 2010 - 2014[13] further validates this view by suggesting an increase in the employment of dental health practitioners.

Forty-eight per cent of the study sample indicated that community involvement in school health programmes was voluntary, and that some parents expected payment for their assistance. The activities that communities were involved in are illustrated in Fig. 1. These activities include HIV/AIDS (77.3%), sexual abuse (54.5%) and agriculture (59.1%), compared with recycling (36.4%), tobacco use (36.4%) and nutrition and food safety (45.5%).

Eighty per cent of rural schools indicated community awareness in nutrition, basic hygiene, cleanliness and gardening. A small percentage (13.6%) of schools indicated an improvement in nutrition as indicated by the following response: 'Pupils eat healthy foods from the nutrition programme and the community is aware that the school promotes healthy food' (response to questionnaire).

Priorities for health promotion and oral health promotion

Of the total sample (n=23) of schools, 72.7% of respondents indicated oral health services in place. Oral health services offered at the schools is illustrated in Fig. 2. Oral health education (81.8%, p=0.003) was the most common activity conducted at schools, and fissure sealant placement (9.1%, p=0.000) the least. However, supporting evidence in school record books indicated that there was

inconsistency in these activities, as they occurred only once at one of the schools and once a year in 65% of the schools.

The sale of healthy foods was mentioned by three respondents (13%). The majority of the respondents (87%) indicated major barriers in the sale of healthy foods to children, e.g. 'Tuck shop outsourced – limited control' and 'No healthy foods are sold at the tuck shop' (responses to questionnaire).

Health promotion training for school staff was not present in the majority (61.9%) of the schools. This was also highlighted as a problem by the district managers. Staff indicated that they lacked basic knowledge in oral health, which resulted in a lack of confidence in the implementation of oral health promotion programmes. Challenges experienced by staff for the implementation of an oral health promotion programme included lack of resources (22%), funds (26%), time constraints (22%), large classes (4%) and support from parents and community (30%).

Discussion

The policy process is recognised as an integral component to guide implementation and sustainability of a programme.[5,14] One of the key policy priorities identified was a need for an integrated approach to health that looked at common risk factors; however, this was not evident as very little priority was given to oral health. Poor oral health and chronic diseases such as cancers, cardiovascular diseases and trauma share common contributory factors such as poor hygiene and diet, smoking and alcohol abuse. The common risk factor approach, which is a more collaborative approach, should therefore be adopted to avoid duplication and to improve the effectiveness and efficiency of health programmes.[15]

The study findings indicated that school principals expressed lack of knowledge and understanding on related health and education policies, compounded by a lack of support from the Department of Education. Oral health screening is included in The Integrated School Health Policy,[4] but there was no evidence of oral health education as a formal component in the school curriculum. Oral health promotion was also perceived as an additional burden on the teaching workload and was not part of the daily routine programme owing to time constraints, high workloads, lack of knowledge and confidence. It is imperative that oral health education be formally included into the school curriculum. Although the study findings indicated an array of oral health promotion activities at the schools (Fig. 2), caution must be exercised in the interpretation of these results as these activities were conducted either once or occurred only once a year. These findings therefore highlight the need for greater collaboration and dialogue between the Departments of Health and Education. Shared resources for oral health screenings and oral health promotion programmes would relieve the burden on resources and could contribute to greater programme sustainability. Commitment from the national, provincial and regional Departments of Health and Education and schools is critical. This commitment requires strategic planning and resource allocation that could support and ultimately sustain the delivery of the integrated school health programmes.

Designated educators at school should work in close collaboration with health and oral health personnel with greater accountability and 'ownership' in these programmes. Further research needs to be conducted to assess the challenges facing educators with these additional responsibilities.

The policy review revealed that the KwaZulu-Natal Department of Education Draft National School Nutrition Programme Policy[16] had guidelines for school vendors and tuckshops. However, findings in this study suggest that this has not been translated into practice. Major barriers were encountered by schools in the sale of healthy foods to children by vendors and tuckshop owners. Although vendors and tuckshop owners were educated and encouraged to buy into the notion of healthy eating, this was not always practical. Healthy foods were seen as too expensive. Schools need to negotiate formal contracts with tuckshop owners and vendors to ensure alignment with the policy. More research is required to further address the challenges related to the implementation of healthy nutritional policies in schools.

Financial restraints and a high turnover (27.7%) and vacancy rate (37.3%) for dental health practitioners were also identified in the Department of Health Strategic Plan 2010 - 2014.[13] The vacancy rate for oral hygienists was 51.9%, negatively affecting oral health education and school screening services.[13] It was also noted that the sustainability of programmes at schools was a challenge due mainly to poor buy-in from the Department of Education.[13] Oral health personnel were mostly hospital based and provided more curative rather than preventive services.[5,17] District managers also reported that preventive programmes did not receive recognition for prioritisation for budgetary allocations. Oral health promotion requires a dedicated budget.

The strategy for the Oral Health 10 Point Plan (2011 - 2015)[11] in KwaZulu-Natal includes the establishment of comprehensive preventive and promotive oral health programmes; however, current shortage of oral health personnel affects the delivery and sustainability of these programmes.[18] The draft National Oral Health Strategy (2010) indicates that oral health promotion and services should be included in health promotion at schools and that nurses, teachers and community health workers should be utilised for oral health promotion programmes.[10] In view of the challenges being faced by educators and school health services, a needs analysis and epidemiological profile should be performed so that resource allocation is based on unmet oral health needs and is in response to the needs of the community. There should also be ongoing stakeholder involvement from the planning to the execution and evaluation of oral health interventions. Additional funding needs to be allocated and more nurses and oral health personnel employed for the success of these strategies and interventions.

Policy formulation and strategic planning must include educators and healthcare workers at grassroots level for the successful implementation and sustainability of oral health promotion programmes. More research needs to be done to support the translation of policy into practice. The focus should be on the process of how these interventions are executed and monitored.

Community support services such as hospitals and clinics are integral for follow-up to school health visits. Although the availability of community support services in rural areas was identified in this study, these are not easily accessible owing to poor roads and transport, and limited resources.[10,13]

The study findings revealed that the conditions and environment of schools were generally good and compliant with the requirements of a Health Promoting School; however, attention still needed to be given to recycling, condition of playgrounds and sanitation in rural areas.

Community awareness and participation was poorly defined and inconsistent. The results further indicated that communities were not aware of available preventive services and follow-up practice for oral health. Schools need to create awareness and improve links with communities through in-depth community engagement programmes in order to facilitate community participation and ownership in decision-making processes. This would be in keeping with requirements of a Health Promoting School.[1]

The availability of clean water and other resources could create challenges in terms of uninterrupted delivery of oral health promotion activities. Furthermore, resources required to ensure healthy lifestyle practices are not available to most families in rural and semirural communities.[6-19,20]

Conclusion

The results of this study indicated that current delivery of oral health promotion services within the Health Promoting Schools Initiative will not reap the desired oral health outcomes due to the inherent mismatch between policy planning and implementation. More research needs to be conducted to address the opportunities and challenges facing educators and other oral healthcare providers working in the school environment.

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6.2 Manuscript 2

Dental caries status in six-year-old children at Health Promoting Schools in KwaZulu-Natal, South Africa.

This manuscript, which has been published in the South African Dental Journal (2015), reports on the investigation of dental caries status and unmet oral health needs of six-year-old children at twenty-three Health Promoting Schools in KwaZulu-Natal that was obtained in the first phase of the study. It addresses a part of objective 2 of the study which is to conduct an epidemiological profile using the WHO DMFT Tool to determine unmet oral health needs of six year old learners at selected Health Promoting Schools in KwaZulu-Natal.

Dental Caries status in six-year-old children at Health Promoting Schools in KwaZulu-Natal, South Africa

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ABSTRACT

The 2003 National Children's Oral Health Survey indicated that 35.2% of six-year-olds in KwaZulu-Natal were caries free and only 40% had received dental treatment. The aim of the present study almost ten years later was to investigate these data in six-year-old children at Health Promoting Schools in KwaZulu-Natal.

Methods: A quantitative, epidemiological explorative study was conducted on a sample of 345 Grade 1 learners attending 23 schools, selected by statistical sampling from the eleven districts of KwaZulu-Natal. The World Health Organisation DMFT Tool (1994) was used to record the data.

Results: The caries rate of the sample was 73% (ie. 27% caries free) and the mean dmft was 3.65. The average dmft per school ranged from a high of 6.8 to a low of 1.1, both from rural districts. 94% of the learners required treatment, the majority (90%) needing preventive care. The Unmet Treatment Need (UTN) was 97%.

Conclusions: The number of caries free six year old children in KwaZulu-Natal has declined further compared with ten years ago. Dental caries is still a major public health problem. An effective and efficient oral health promotion programme will do much to instil simple healthy behaviours at an early age.

Keywords: dental caries prevalence, health promoting schools, oral health promotion, oral health services, treatment needs.

INTRODUCTION

Three national studies have been conducted in South Africa. The first by Williams in 1984 was on dental health status of 12-year-olds.[1] The second study determined oral health status of adults and children in the five main cities in South Africa in 1988/89, and the third study in July 1999 to June 2002 focused on children between the ages of 4 and 15 years.[2-3] The latter two studies were conducted by the National Department of Health.

ACRONYMS

BASCD: British Association for the Study of Community Dentistry
UTN: Unmet Treatment Need

The National Children's Oral Health Survey (2003) indicated that only 35.2% of six-year-olds were caries free in KwaZulu-Natal and 40% received dental treatment.[2] A comparison of results for six-year-olds in the Durban region for both of the Department of Health National surveys indicated that there was a decrease in mean dmft from 3.89 (1988) to 3.42 (2002) and decayed teeth from 3.58 (1988) to 2.79 (2002) with no difference in results for the number of filled teeth (0.15).[2-3] One of the new National Goals for six-year-olds for 2020 is to increase the percentage of this age group who are caries free to 60% in addition to having fissure sealants placed in 60% of these children.[4]

Dental caries is influenced by multiple factors such as diet, socio-economic status and the availability of oral health services. The affliction has been identified as the most widespread condition affecting children in South Africa. The inevitable dental pain and discomfort result in the loss of school days and dental caries has become a major public health concern because of the burden it places on public health services.[4-5]

Evidence in the literature suggests that intervention strategies that are currently employed are standardised and not evidence-based for diverse populations. These interventions are therefore not producing the desired outcomes resulting in the failure of the current National Oral Health plans in South Africa.[4] Consequently, the prevalence of caries in children has not been adequately addressed through policy and service delivery.[6]

There is a paucity of information available on dental caries status in KwaZulu-Natal, South Africa, particularly in the rural areas where the majority of the population live.[7-8] The last National Oral Health Survey, conducted ten years ago,

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established that there was an increasing rate in caries in six-year-olds especially in the primary dentition. The school setting, where education and health programmes can have a great impact by influencing learners at important stages in their lives – childhood and adolescent, was chosen for this study.[9] The purpose was to assess the dental caries status of a sample of six-year-old learners at health promoting schools in KwaZulu-Natal and to establish new baseline information prior to the implementation of an oral health promotion programme at these schools.

METHOD

The study sample (n=345) comprised of Grade 1 learners attending 23 schools that were selected from the eleven districts of KwaZulu-Natal using multistage cluster sampling. Schools were selected according to districts and then quintiles. Using a sample size calculator, a power calculation was done with a confidence level of 95% and a confidence interval of 5, selecting 345 learners for caries assessment from a total of 2402 Grade 1 learners, a selection that translated to an average of 15 learners per school. Systematic random sampling was used to identify participants by randomly selecting learners from approved parental consent forms that were provided to each school. The reporting of the status of the tooth focused on primary teeth, given the age group that was examined, and given the presence of only a few permanent teeth. However permanent teeth were included for the assessment of treatment needs, to report on caries arrest and sealant care for this age group.

This was an epidemiological explorative study using quantitative data. The World Health Organisation DMFT Tool (1994) was used to record the data.

Gatekeeper permission was obtained from the Department of Education and the principals of the selected schools. The study was approved by the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (HSS/0509/013D) and ethical guidelines was used to ensure confidentiality in the management of data.

An information sheet and parental consent forms in English and Zulu were sent to all parents of Grade 1 learners at selected schools requesting consent for dental examination. Assent was obtained from the learners prior to the examination. Examinations were conducted only on learners who were willing and whose parents had granted consent. Field assistants were calibrated for visual dental caries diagnosis using the method developed by the British Association for the Study of Community Dentistry (BASCD) with intraoral photographs to a kappa score of 0.90 for inter examiner reliability.[10] Intra examiner reliability was maintained according to World Health Organisation standards for oral health surveys by repeating every fifth oral examination completed.[11] A tooth was recorded as decayed only if there was a visible break in enamel and missing teeth were scored only if it could be ascertained that the loss was due to caries. There was no treatment score for arrested decay with no pain on deciduous teeth.

Non-invasive oral examinations, using only a wooden spatula for retraction, were performed on learners sitting on a chair in good natural light with their heads slightly tilted, either forwards or backwards, and the examiner seated in front. Optimal infection control procedures were maintained by using new spatulas and gloves for each patient and having the examiner wear a mask. Learners requiring further dental management were referred to the nearest dental clinic.

Data was recorded on the World Health Organisation DMFT tool and transferred onto Excel. The statistical package used for data analysis was SPSS version 21.0.

RESULTS

The sample of Grade 1 learners (n =345) had a ratio of males to females of approximately 1:1 (51.6%:48.4%). The mean age of the participants was 6.8 years with 96.7% in the six to eight year old age group. Fourteen (60.9%) of the schools were in rural areas, six (26.1%) in the peri-urban and three (13%) in urban areas.

The Pearson Chi Square Test showed no significant differences in the results of the repeated tests for intra examiner reliability, confirming repeatability.

Of the total study sample (345) of learners, 130 (37.7%) male learners presented with caries compared with 114 (33.0%) female learners. The Fischer's Exact Test (p-value 0.196) implied that there was no significant relationship between gender and the number of decayed teeth. The prevalence of caries between the rural and the urban learners also showed no significant difference.

The caries experiences of primary teeth of six-year-olds are shown in Table 1.

Table 1: Caries experiences of the primary teeth of the six-year-olds in a KwaZulu-Natal sample.

	Primary
Mean no. of primary teeth per person	14.98
No. and percentage of subjects with caries	253 (73%)
Mean number of decayed primary teeth per person	3.13
No. of missing primary teeth	175
Percentage of missing primary teeth per person	2.54%
No. of filled primary teeth	8
Percentage of filled primary teeth from total number of teeth examined (n=7617)	0.11%

The mean number of primary teeth and the mean number of decayed primary teeth per person was 14.98 and 3.13 respectively. The percentage of subjects with caries in the primary dentition was 73%. Only 0.11% of total number of primary teeth examined was filled and the percentage of missing primary teeth per person was 2.54%.

Table 2 shows a distribution of the components of dmft with low missing (0.5) and filled (0.02) components and a mean dmft of 3.65.

Table 2: Distribution of the mean dmft and the components of dmft for the six-year-old age group

dmft	d	m	f
3.65	3.13	0.5	0.02

The severity of dental caries expressed as the mean dmft for schools and percentage dmft per child and district in KwaZulu-Natal are shown in Table 3.

The mean dmft scores for the districts ranged from a low of 1.9 (Umkhanyakude) to a high of 5.7 (Amajuba).

Table 3: dmft per school and percentage dmft per child and district in KwaZulu-Natal

District	School	*Rural/Peri-urban/ urban R/PU/U	Average dmft District/School	% dmft per child	% dmft per District
			5.7		
Amajuba	Cebelihle P	R	6.8	21	18
	Clavis P	R	4.7	15	
			4.6		
eThekweni	Greenbury P	PU	4.7	15	14
	Zakhele P	PU	4.4	14	
			4.0		
Sisonke	Ixopo P	R	4.1	13	13
	Mazongo P	R	3.9	12	
			3.2		
Ugu	Mdlazi P	R	2.8	9	10
	Port Shepstone P	PU	4.0	13	
	Port Shepstone JP	PU	2.9	9	
			4.4		
Umgungundlovu	Fairleigh P	R	3.9	12	14
	TPA P	U	4.9	15	
			1.9		
Umkhanyakude	Echwebeni P	R	2.6	8	6
	Ezimbidleni P	R	1.2	4	
			2.9		
Umzinyati	Endumeni P	PU	4.7	15	9
	Mashesheleng P	R	1.1	4	
			4.3		
Uthukela	MLS Colenso P	PU	4.3	13	14
	MLS Ladysmith P	U	4.4	14	
			2.7		
Uthungulu	Bay P	PU	3.3	10	8
	Phalane P	R	2.1	6	
			3.1		
Zululand	Thengisangaye P	R	3.5	11	10
	Velankosi P	R	2.7	8	
			3.4		
iLembe	Nokubusa P	R	3.5	11	11
	Nophungwa P	R	3.4	11	

*A peri-urban area is classified as an area immediately around an urban area and a rural area is found outside the cities and towns.

The d component of the dmft made up more than 85% of the total mean. The mean range dmft for schools was 1.1 (Mashesheleng, Umzinyati District) to 6.8 (Cebelihle, Amajuba District) which are both located in rural areas.

The percentage dmft per child ranged from a low of 4 (Mashesheleng Umzinyati District and Ezimbidleni Umkhanyakude District) to a high of 21 (Cebelihle, Amajuba District). This translated to 96% of the children having a dmft of 0 in the Umzinyati and Umkhanyakude districts, both rural areas. The percentage dmft per district ranged from a low of 6 (Umzinyati and Umkhanyakude) to a high of 18 (Amajuba). This meant that 94% of the children were caries free in the Umzinyati and Umkhanyakude districts, but only 82% in Amajuba.

Of the total sample only eight teeth had fillings recorded with seven from Bay Primary in the Uthungulu district. Seven fillings were present in one child. There were a higher number of posterior lower teeth missing due to caries compared with upper teeth.

The number of carious primary teeth by school and district in KwaZulu-Natal are shown in Table 4.

The percentage of decayed teeth varied widely for schools and districts with scores of 6 to 33.7 and 8.7 to 27.5 respectively. Umkhanyakude district, which had the lowest scores and Amajuba the highest are both rural areas.

The number of carious upper and lower primary anterior (incisors and canines) and posterior (first and second molars) primary teeth for the study sample are illustrated in Table 5.

The lower molar teeth suffered a higher incidence of caries present compared with the upper molars (508 vs 331).

Table 4: The number of carious primary teeth by school and district

District	School	Caries	% Caries/School	% Caries/District
Amajuba	Cebelihle P	101	33.7	27.5
	Clavis P	64	21.3	
eThekweni	Greenbury P	54	18	19.3
	Zakhele P	62	20.7	
Sisonke	Ixopo P	52	17.3	17.8
	Mazongo P	55	18.3	
Umgungundlovu	Fairleigh P	45	15	17.3
	TPA P	59	19.7	
iLembe	Nokubusa P	52	17.3	17.2
	Nophungwa P	51	17	
Uthukela	MLS Colenso P	42	14	14.7
	MLS Ladysmith P	46	15.3	
Zululand	Thengisangaye P	43	14.3	13.5
	Velankosi P	38	12.7	
Umzinyati	Endumeni P	61	20.3	12.8
	Mashesheleng P	16	5.3	
Ugu	Mdlazi P	36	12	12.3
	Port Shepstone P	51	17	
	Port Shepstone JP	24	8	
Uthungulu	Bay P	40	13.3	12
	Phalane P	32	10.7	
Umkhanyakude	Echwebeni P	34	11.3	8.7
	Ezimbidleni P	18	6	

The findings for the anterior teeth were the opposite with a higher number of carious lesions present in the upper teeth. Higher caries scores were found predominantly in the rural areas.

Table 6 shows the treatment needs of learners.

From the total sample (n=345), 94% (324) of the learners required some form of treatment. Ninety percent (90%) of the learners required preventive care, 35%, surface fillings and 5%, extractions. Learners at Sisonke, Ethekweni and Ugu districts required more fillings compared with learners in the Umgungundlovu and Ilembe districts.

The mean number of teeth requiring treatment per child was 4.3. Fissure sealants were required on 16.4% of the secondary (first permanent molar) teeth examined; while 4.6% and 0.5% (primary and secondary) teeth required fillings and extractions respectively.

DISCUSSION

The current data may not be a good indicator of the impact of caries in South Africa.[12] A small number of epidemiological studies have been conducted in KwaZulu-Natal, especially in the rural areas.[7] This has resulted in limited information on dental caries status being available to inform planned oral health interventions that is based on the needs of the population. There have been few or no studies which have considered etiological factors, parental education and social factors that include various population groups and social classes.[6,12-15] Similar findings have been found in studies done elsewhere in Africa where various diagnostic methods were used and there was a variation in the age groups assessed.[16]

Of significance in dental caries epidemiological studies are the methods used for population sampling.[15] South Africa has a diverse population with various social groups as well as populations living in different geographic locations namely urban, peri-urban and rural areas. It is therefore imperative

Table 5: Number of carious upper and lower anterior and posterior primary teeth.

Type of tooth	Number of carious teeth
Upper first and second molars	331
Upper incisors and canines	198
Lower first and second molars	508
Lower incisors and canines	34

Table 6: Treatment needs of learners.

No. and percentage of participants requiring preventive/caries arresting care	311(90%)
No. and percentage of participants requiring surface fillings	120 (35%)
No. and percentage of participants requiring extractions	17(5%)
No. and percentage of children needing treatment	324 (94%)
No. and percentage of teeth (secondary) requiring fissure sealants	1130 (16.4%)
No. and percentage of teeth (primary and secondary) requiring fillings	320 (4.6%)
No. and percentage of teeth (primary and secondary) requiring extractions	38 (0.5%)
Mean no. of teeth per child requiring treatment	4.3

that consideration be given to geographic distribution and to the methods used for population sampling prior to the planning of intervention strategies for dental caries.[17] These data would inform policy planning and service delivery so that policies are tailored to meet the oral health needs of the various communities especially at district level.[6,13]

This study therefore drew a sample which included all eleven districts of KwaZulu-Natal. Any programmes to be implemented in response to the oral health needs of six-year-olds in the Province should then be informed by the data collected, which could be used as a baseline for other studies.

It is recognised that the permanent teeth were present for only a short period of time in the age group examined and were therefore were not exposed to caries risk factors for any length of time.

The results from this study were compared with the KwaZulu-Natal results from the two National Oral Surveys conducted in South Africa as shown in Table 7.

The Unmet Treatment Need Index (UTN)) was used to calculate the amount of oral health services needed to be provided for treatment of caries in the six-year-old age group. The UTN was 97% which translates to more than 90% of all caries in this group remaining untreated in KwaZulu-Natal. Comparison of the results obtained in the Durban area to the National Oral Health Surveys (Table 7) showed an increase in the decayed (d) component and a decrease in the filling (f) component. The increase in the d component could be as a result of a change in diet in this area. The decrease in f component could be as a result of extractions being the only option offered at primary health care centres.[18]

Results from this study showed an increase in prevalence of caries for six-year-olds in KwaZulu-Natal when compared with the results obtained in the last National Oral Health Survey (2003) (Table 7). Evidence also shows only that one district (Umkhanyakude) from the eleven districts had a low dmft score (1.9) (Table 3) indicating that dental caries has not been adequately addressed and that there remains a need for an improvement of oral health services in KwaZulu-Natal. When the data was further analysed it was clear that there was an increase in the d and m components and a decrease in the f component of the dmft with the latter indicating a possible decrease in the provision of restorative procedures in oral health services. The literature states that in KwaZulu-Natal the focus is currently on curative (extractions) rather than preventive services with a priority not given to oral health in budget allocations.[7,18] With the increase in decayed and missing teeth it becomes imperative that children and mothers be targeted for preventive services so that parents and children understand the carious process and how to implement simple procedures for its prevention.

Results from this study have further identified that the percentages of caries amongst the rural sample varied considerably when compared with the experiences in the urban and peri-urban areas. There were also wide differences in the mean dmft per school and in the percentage dmft per child and per district for primary teeth. Although schools from the urban areas had high dmft scores (4.4; 4.9), they were not as high as in some of the rural areas (5.7) (Table 3). These results differed from studies done in other provinces in South Africa where rural scores were all lower than those in urban and peri-urban areas.[19-20] A study conducted in Portugal showed the opposite trend with caries scores significantly higher in rural areas.[21] The higher scores in the rural areas in the current study could be due to incorrect diet, source of water and fluoride content, lack of knowledge on oral health education, poor access to oral health care, and affordability of fluoridated toothpaste.[22] More research should be done to establish the risk factors for caries and the reasons for the swings in high and low scores in rural areas.

Primary teeth in the rural and urban areas were found to have no restorations but there was evidence of a minimal amount of conservative work on children in the peri-urban areas with the majority from a school in the Uthungulu district. Similar results were obtained in a study undertaken in Venda.[19] Overall it appears that scant curative services are delivered. This could be as a result of a scarcity of oral health personnel, limited resources, lack of accessibility to facilities and affordability. Priority needs to be given to six-year-olds for curative and preventive services.

Most relevant was the confirmation that the percentage of learners requiring treatment was very high (94%) (Table 5). The most common type of care needed was preventive services (fissure sealants). The need for prevention and restorations was higher than the need for extractions. This could be as a result of the criteria used where teeth that were decayed with no pain and could not be restored were nevertheless not indicated for extraction. Reasons for these high scores could include affordability and a lack of availability and accessibility to oral health services, especially in rural areas. The type of services required varied between districts. All districts required preventive services. The majority of restorations required came from the Sisonke, eThekweni and Ugu districts. For these services to be provided relevant oral health personnel, facilities, equipment and materials would have to be accessible.

Only 27% of the sample six-year-old age group in KwaZulu-Natal are caries free. More than 90% of caries goes untreated. If the criteria for the new National Health Goals for 2020, which state that 60% of 6-year-olds must be caries free and have fissure sealants placed on their first molars in Grade 1 are to be met in KwaZulu-Natal, oral health services would need to be drastically improved.[4] In order for this to occur, School Health Services would need to prioritise oral health

Table 7: Comparison between data from NOHS 1988, 1999-2002 and that from current study of prevalence of dental caries and untreated caries in six-year-olds in KwaZulu-Natal

	% caries KZN	% untreated caries KZN	% children need care KZN	dmft Durban	d (Durban)	f (Durban)
1988				3.89	3.58	0.15
1999 – 2002	64.8	59.9	62.3	3.42	2.79	0.15
2013	73%	71%	93.9	4.55	3.1	0

Source: Department of Health. In van Wyk PJ (ed) National Oral Health Survey South Africa 1988/89[3]
Department of Health (2003). Report: National Children's Oral Health Survey: 1999-2002.[2]

services by employing oral health personnel such as oral hygienists and dental therapists and ensuring that the focus of services provided at clinics should include restorative care for the treatment of caries.

Results from a previous study conducted in Hlabisa in 2002 were also compared with results from the Umkhanyakude district in this study, to which Hlabisa belongs.[23] The dmft for the Umkhanyakude district was 6 in this study, which was double the score for Hlabisa (3). The increase in dmft could be as a result of an increase in per capita sugar consumption together with a decrease in water fluoride levels.[24] There was a slight difference in the number of fissure sealants required per learner in both studies but there was a huge difference in the number of learners requiring restorations. In this study only 8 learners required restorations compared with 95 in the Hlabisa study. This large difference could be due to the differing criteria used for caries diagnosis in the deciduous teeth.

This study has revealed a high caries prevalence in the six-year-old age group in KwaZulu-Natal highlighting the need for a change in approach to the control of this disease. Taking into consideration the difference in availability of oral health services in the various districts and the fact that it will take a long time for this issue to be addressed due to limited funding, the school setting could provide an affordable platform for oral health promotion programmes based on the needs of the community at a local level. Data provided in this study reflects what is currently in place in KwaZulu-Natal and can be used as a basis for future planning of preventive programmes targeting primary school children.

CONCLUSION

The number of caries-free six year old children in KwaZulu-Natal has declined further compared with ten years ago. Dental caries is still a major public health problem and most children require some type of treatment including preventive care. Current oral health services need to shift from a curative to a more preventive approach for an improvement in service delivery. An effective and efficient oral health promotion programme at schools, targeting both parents and young children will do much to instil simple but beneficial oral health behaviours at an early age. It will take a long time to bridge the gap currently present, but making available basic information to learners and parents for the prevention of caries would be a good start.

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6.3 Manuscript 3

The promotion of oral health within Health Promoting Schools in KwaZulu-Natal

This manuscript reports on the evaluation of the implemented tooth brushing programme at selected Health Promoting Schools in KwaZulu-Natal. It assesses the efficiency and sustainability of the tooth brushing programme that was implemented at the school. This manuscript reports on data obtained from the first and third phase of the study. It addresses objective 5 of the study which is to determine opportunities and barriers to the incorporation of a tooth brushing programme at Health Promoting Schools in KwaZulu-Natal.

The promotion of oral health within Health Promoting Schools in KwaZulu-Natal

Background

Oral health promotion is a cost effective strategy that can be implemented at schools for the prevention of oral diseases. The importance and value of school-based interventions on children has been identified in South Africa. Although oral health strategies include integrated school-based interventions, there is a lack of published evidence on whether these strategies have been translated into practice and whether these programmes have been evaluated. The aim of this study was therefore to evaluate an implemented tooth brushing programme at Health Promoting Schools in KwaZulu-Natal.

Objective

To assess the efficiency and sustainability of the tooth brushing programme implemented at Health Promoting Schools in KwaZulu-Natal.

Methods

A mixed methods approach was used for this study conducted at 23 Health Promoting Schools in KwaZulu-Natal. This paper reports on the evaluation of the tooth brushing programme that was implemented at the schools using data saturation technique and focus group discussions. Triangulation was used for evaluation. The study was approved by the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (HSS/0509/013D).

Results

The intervention implemented had created awareness to oral health for learners, educators and parents. Findings in this study indicate that although there were benefits obtained from this school-based intervention, many challenges affected its sustainability. Time constraints, large classes and a lack of adequate resources and funding affected the sustainability of the programme.

Conclusions

The school setting has the potential to deliver integrated preventive and promotive programmes provided they are supported by adequate funding and resources.

Introduction

The National Department of Health in South Africa identified oral health promotion as a cost effective strategy to reduce the burden of oral diseases in local communities.[1] Most oral diseases can be prevented. However, once they are established they are irreversible and could therefore affect quality of life.[2] Oral health promotion strategies therefore support preventive interventions. High risk behaviours such as foods and drinks high in sugars, tobacco and alcohol can affect oral health.[3] These high risk behaviours can be controlled in a school setting through school policies, physical environment and education in oral health.[2]

Over a billion children attend schools worldwide. Schools therefore provide an ideal setting in the formative years of children's life for the implementation of school-based interventions. Moreover, schools have been identified as the most creative and cost effective way of improving oral health and in turn quality of life by providing the foundations for healthy patterns of behaviour that follows into adulthood.[3,4] International reviews conducted by Cochrane Collaboration could not establish conclusive evidence on the effectiveness of school-based interventions.[5] However, studies conducted in China, Indonesia, Brazil and Iran have shown positive results.[6-8] The importance and value of the impact of school-based interventions on children has been identified in South Africa.[9]

South African oral health policies and strategies have therefore prioritised school-based preventive programmes.[10] Oral health strategies noted in the Oral Health 10 Point Plan 2011-2015 for KwaZulu-Natal included integrated school-based Tooth Brushing Programmes, fissure sealant programmes and integrated screening and education programmes.[11] However, there is a lack of published evidence on programme evaluation and whether these strategies have been translated into practice.

The purpose of evaluation as defined by the World Health Organizationis to generate information that can be utilised by stakeholders responsible for the improvement of interventions.[12] This would therefore ensure the implementation of effective interventions, sharing and disseminating of high quality practice, making maximum use of limited resources, providing feedback to all participants and informing the development and implementation of policy.[13]

Evaluation should be a key component in planning school oral health promotion programmes.[14] The subsequent documenting and publishing of the processes and outcomes of the intervention would enable the sharing of knowledge globally.[15] Both process and outcome data are required for an all-inclusive evaluation of a community-based intervention. However, international reviews on oral health promotion literature indicate that current evaluation outcome measures employed are inappropriate and of poor quality.[16] Information obtained from how the intervention was implemented (process evaluation) assists in re-evaluating future planning and delivery of the intervention while outcome data assesses the short, medium or long term effects of the intervention.[17] This study evaluated the short term effects of the intervention for efficiency and sustainability. Efficiency measured whether the programme was implemented in the most efficient and cost effective way and sustainability investigated whether the programme would be able to be maintained.

The aim of this study therefore was to evaluate an implemented tooth brushing programme at Health Promoting Schools in KwaZulu-Natal to test for efficiency and sustainability.

This presentation is part of a bigger study that examined the viability of incorporating oral health promotion into the Health Promoting School Initiative in KwaZulu-Natal. The study

was divided into three phases. The first phase comprised of a situational analysis. The intervention was implemented in the second phase based on the findings obtained in phase one and subsequently reviewed in the third phase of the study.

It was established from quantitative baseline data obtained from a questionnaire that 54,5% of the schools in this study had a tooth brushing programme at their school. However, on further investigation of school records and responses to qualitative data obtained from the questionnaire completed by school principals in phase one of the study, it was established that there was inconsistency in the frequency of these activities.

Study Design

This study was conducted in the eleven districts of KwaZulu-Natal. Twenty three schools from quintiles 1 to 5 were randomly selected from a total of 154 launched primary Health Promoting Schools for phase 1 of the study. A situational and needs analysis was conducted in the first phase of the study using interviews, questionnaire, data capture sheet and WHO DMFT Tool. An oral health promotion intervention based on the needs analysis conducted in phase 1 of the study was implemented at twenty schools that had given consent to conduct the programme. Telephonic conversations were first held with school principals and members of the teams responsible for health promotion at the selected schools, to establish their willingness to participate in phase 2 of the study. Appointments were then made at the schools with the school health team to report on phase 1 of the study and to formulate and implement interventions based on the needs of the learners. A memorandum of understanding was signed between the school principals and researcher for the implementation of the intervention. Key activities that should be included in the inventions were discussed with the school health team. Activities included:

- A tooth brushing programme, using fluoridated toothpaste and a toothbrush, conducted once a day after meals. Instructions were also given on tooth brushing technique, application of toothpaste and storage of toothbrushes to educators involved with the progamme. Educators were also encouraged to involve parents in the programme and to outsource the supply of toothbrushes and toothpaste once the supplies that were provided were depleted. Educators were asked to identify businesses or individuals inside and outside of the community that could assist with the supply of resources.
- The curriculum review in the first phase of the study indicated that oral health education was not integrated into the school curriculum. Educators were therefore encouraged to try and implement regular oral health education into their school curriculum and parent meetings to create awareness.
- Educators were also advised on controlling sugary snacks being sold at the tuck shop and by vendors and advising parents on sending healthier lunches for their children.

A three month supply of toothbrushes and toothpaste was provided to the schools to commence the programme. The school health team was asked to appoint a person at the school to monitor the programme. A mobile messenger application was also set up between the researcher and school health teams to allow for ease of communication with the researcher as well as a means of sharing ideas between the schools.

This paper reports only on the evaluation of the tooth brushing programme that was implemented at the schools for the purposes of this publication. Data saturation technique was used in phase three of the study resulting in thirteen schools making up the sample

population. Focus group discussions were conducted six months after the implementation of the intervention to gain insight on the educators experience with the implementation of the programme. These discussions lasted between 30 – 45 minutes and were recorded with the permission of the participants. The interview focused on opportunities, challenges, benefits and support that were available for this intervention. Qualitative responses were first transcribed verbatim and then examined for broad categories that were related to the research questions. These categories were then further refined and coded. Open, axial and selective coding was used. The data was firstly examined, named and then categorised into phenomena using open coding. Links were then formed between the categories and sub-categories. Core categories were then created through selective coding.[18] Quantitative responses were analysed using SPSS version 21.0.

To ensure validity, triangulation was used for evaluation.[19] Triangulation entails gathering evidence from diverse sources and drawing conclusions based on all the data collected.[20] Therefore mixed methods, using both qualitative and quantitative data and data source triangulation was used.

Gatekeeper permission was obtained from the Department of Health and Department of Education. The study was approved by the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (HSS/0509/013D). The University of KwaZulu-Natal ethical guidelines was used to ensure confidentiality, consent to conduct interviews and data management. Codes were used to maintain anonymity and data collected was only accessible to the supervisor and the researcher.

Results

A total of 2065 Grade 1 learners participated in the tooth brushing programme at the twenty schools. Since the data saturation technique was used this paper reports only on the feedback received from the thirteen schools in phase three of the study. One (8%) school was not able to continue with the programme at school due to time constraints and problems experienced with the hygienic storage of tooth brushes and availability of glasses to rinse. Educators therefore sent the tooth brushes and toothpaste home for learners to use. Three (23%) schools conducted the programme twice a week and one (8%) school three times a week. Daily tooth brushing was conducted by eight (61%) of the schools although they did highlight time constraints and lack of resources as a problem. It was alarming to note that from twelve (92%) out of the thirteen schools, learners did not brush their teeth at home as they did not possess toothbrushes and paste.

Four salient themes emanated from the data. These included awareness, manual tooth brushing technique and frequency, support for interventions and resources. The benefits and challenges are embedded into the identified themes for reporting.

Awareness

Study findings indicated that awareness to the importance of oral health was created for learners, educators and parents. Responses from all (100%) focus group participants in phase three of the study emphasized that the impact of the interventions had created awareness to oral health for their learners as indicated in the following narrative: *'Learners now know the importance of brushing their teeth;' 'It is in their culture – don't brush their teeth'*. It must be noted that although some of the schools were quintile 5, the pupils that attended the school were residents from rural areas and could not afford tooth brushes and paste and therefore

had little exposure to tooth brushing. Focus group participants at one of the schools were also of the opinion that learners could be monitored at school as parents left early to work and therefore children forgot to brush their teeth before they came to school. Moreover, a learner at one of the schools sought the researcher's opinion: *'I am unhappy with the colour of my teeth. What can I do to prevent this discoloration?'*

Three participants (23%) to focus group discussions further indicated that this programme had created awareness to oral health for educators as indicated by the following response: *'It was beneficial to educators – an eye opener – they are now aware of oral health and how important it is'*. Furthermore, parent awareness had been created in three (23%) of the schools by learners who asked their parents why they do not brush their teeth at home.

Learners had also become increasingly aware of the correct foods to eat at two (15%) schools. Responses to focus group discussions at these schools showed that learners were now particular about what they ate and corrected their friends when they found them eating unhealthy foods or bringing unhealthy lunches. They also chose the buying of fruit over chips from vendors. One participant provided the following information: *'A learner in my class visited her dentist for treatment and he offered her a sweet at the end of the visit. She refused the sweet as she had now learnt that this was not good for her teeth'.* The participant attributed this marked improvement in the awareness that was created by the oral health promotion programme.

Manual tooth brushing technique and frequency

Four (31%) of the focus group participants indicated that the implemented tooth brushing programme had created the appropriate awareness of the correct brushing technique as specified by the following commentary: *'Learners learnt how to brush their teeth as some of them were not familiar with the tooth brushing routine'*. Responses from participants in the focus group discussions also indicated that learners also now knew why it was important to brush their teeth in the mornings and evenings.

Although the intervention had created awareness to oral health and learners were now familiar with the tooth brushing technique, educators faced many challenges that impacted on the programme. Responses from three (23%) schools in the focus group discussions indicated that learners chewed on their toothbrushes and ate the toothpaste resulting in supplies not lasting long thereby impacting on the tooth brushing programme as replacement of the toothbrushes was not affordable.

Of the total focus group sample, the majority (70%) of the schools identified time constraints as a limitation to the implementation of the oral health promotion programme as demonstrated in the following response: *'We only do what is relevant to the curriculum due to time constraints. Anything additional is difficult. Also the school enrolment is high so it becomes impossible to manage large numbers for oral health promotion activities'*. One of the participants also specified that low staff numbers meant that educator workloads were more. Because of time constraints one of the focus group participants proposed that learners take their toothbrushes home and use them. This however created other challenges as some learners did not use them at home and others lost their toothbrushes. Seemingly, participants at two (15%) schools managed as indicated by the following response: *'Coped with time – procedure took five minutes'*.

Support for interventions

Of the total focus group sample, five (39%) schools indicated that they had some support for oral health interventions but it was not continuous, and seven (54%) schools received no support at all. Study findings indicated that the support for oral health interventions was received from Colgate World of Care and Department of Health. However, this was not continuous and depended on the availability of supplies as indicated in the following response: *'Oral health personnel only visit the school when they have toothbrushes and toothpaste to give the children;' 'Colgate world of Care visits but this happens only once a year'*. All (100%) focus group participants indicated that once the supplies were finished the programme had to be discontinued as the schools had no funding for oral health. Educators recommended purchasing of toothbrushes and paste by parents. However, this did not occur as parents could not afford it as indicated in the following response: *'Most parents are grandparents who depend on pensions or grants – therefore cannot afford supplies'*.

Evidently, the tooth brushing programme had to be discontinued once the supplies were finished. However one quintile 1 school of the total focus group sample described that they had support as demonstrated in the following response: *'Nurses come almost every week and advise children. Parents assist to a limited extent. Colgate also gave support'*. It could be assumed that this district was adequately resourced with school health nurses who did not have many schools to visit.

All participants (100%) in the focus group reported that there was no budget for oral health and that the money that they received from the Department of Education was minimal and it was therefore impossible to fund oral health promotion programmes.

Resources

All schools (100%) in the focus group discussions identified the availability of one or the other resources as a barrier or challenge to the success of the tooth brushing programme. Access to water, which was highlighted by five (38%) of the schools, was found to be a major barrier to the implementation and success of the oral health promotion intervention as demonstrated by the following response: *'It is difficult for learners to do tooth brushing at school because we do not have running water'.* Evidence of the shortage of water in the Sisonke district was also brought to the attention of the researcher on her visit to a school in the Sisonke district where it was conveyed by educators that children had to walk 5 kilometres to the river each day to fetch water, when there was no rain. This had ramifications on learners missing valuable time at school.

Participant responses to focus group discussions also indicated that there was a lack of basins and glasses or cups for rinsing as evident from the following narrative: *'There are not enough glasses for rinsing;' 'There is only one basin to forty learners'*. Respondents further indicated that as a result of the limited basins and taps at certain schools, learners often would make a mess, which will thereafter have to be cleaned, resulting in the wastage of time.

Another key challenge for the tooth brushing programme that was encountered by the educators was the supply of tooth brushes and paste together with the hygienic storage of tooth brushes as reported by all (100%) participants in the focus group discussions. Participants could not secure sponsorships for the supply of tooth brushes and toothpaste and therefore the programme had to be discontinued once the supplies were finished as illustrated in the following response: *'There are no sponsors to supply tooth brushes and toothpaste.*

Supplies are finished therefore we cannot continue with the programme. Need a regular supply of toothbrushes and toothpaste'. Participants also found that the hygienic storage of tooth brushes was a challenge, especially in the larger classes. In addition the labelling and distribution of tooth brushes was time-consuming.

Some participants from the focus group discussions attempted to improvise with resources that they had and suggested the supply of racks to store the tooth brushes. They were also of the opinion that parents should buy the tooth brushes and toothpaste. However, although this was recommended this would pose a difficulty in poverty stricken areas were parents did not prioritise the buying of tooth brushes and paste as this was a luxury they could ill afford. In addition, some parents depended largely on social grants as an income as illustrated in the following statement: *'Most parents are grandparents who depend on pensions or grants'*.

Discussion

The school setting has been identified as the most creative and cost-effective way for the improvement of health, oral health and in turn quality of life.[21] Integrated, school-based preventive and promotive oral health programmes have been prioritized in KwaZulu-Natal.[11] However, there is a paucity of information on its implementation and effectiveness. Although findings in this study indicated that some schools had tooth brushing programmes, they were not consistent. Therefore, the knowledge gained from this study might be useful for future school-based preventive programmes. Findings in this study indicate that although there were benefits obtained from this school-based intervention, many challenges affected its sustainability.

The effectiveness of brushing daily with fluoride toothpaste is supported and reinforced by clinical trials.[22-3] Furthermore, schools are often used as a platform for supervised tooth brushing programmes.[24] From the data collected it is apparent that awareness to the importance of daily brushing had been created for learners, educators and parents. The tooth brushing programme had created an interest for learners, especially in the rural areas. Noticeably, from participant responses the tooth brushing programme successfully inculcated correct brushing techniques and further routinized the daily practice of learners by brushing their teeth at least twice a day. It was further noted from findings in this study that the majority of learners did not have tooth brushes or toothpaste and therefore did not brush at home. Respondents to the interview suggested that this could be due to affordability as many parents are poverty-stricken, unemployed or depend on social grants. The awareness created by this programme for the learners was also imparted to their parents. These findings support the reasons for the recommendations made by the World Health Organization for the promotion of oral health through schools.[25] Saied-Moallemi et al. (2009) also argued for parental awareness of interventions at schools.[26] Evidently educators also benefitted from this programme through self-reflection.

The cultural beliefs and attitudes of parents on oral health is imparted to their children.[27-8] Poor oral health is prevalent in some cultures as a result of a lack of knowledge and access to care.[29] Evidence of the impact of cultural values on the effectiveness of oral health promotion interventions was also publicized in studies by Schou and Wight (1994) and Rayner and Cohen (1970).[30-1] Findings in this study indicated that it was not a habit in certain cultures to brush their teeth and therefore the majority of children in this study came to school without brushing their teeth. The tooth brushing programme had therefore had a positive effect by inculcating a change in their habits.

The intervention had also highlighted the importance of correct eating habits which enabled the learners to make informed choices about their purchases from the tuck shop and vendors as well as the types of lunches they brought to school. These findings demonstrate that oral health risk behaviours can be modified in learners through oral health promotion. Similar findings were noted in Tanzania.[32] Although there was some success reported with the tooth brushing programme, educators faced many challenges with its implementation.

A challenge encountered by the majority of the schools was time constraints. Educators found the tooth brushing programme time consuming especially with the larger classes. Staff shortages which resulted in higher workloads, together with a demanding curriculum, also impacted on the programme. These additional activities would undoubtedly and incrementally add to their existing workload.[33] It was evident, however, that some participants coped with the implementation of the programme. An observation made by the researcher on her visits to all the schools was that the success of the programme was also dependent on the commitment of teachers. Similar observations were noted in school-based brushing programmes in Southern Thailand.[34]

Findings in this study indicated that the majority of the schools did not receive support for oral health promotion interventions. However, although some schools indicated that they had some support from the Department of Health and Colgate World of Care, it was not continuous. On further enquiry it was established that although Colgate World of Care had formed a partnership with the Department of Basic Education and Department of Health, there was currently only one mobile unit serving the entire province of KwaZulu-Natal. Therefore, the schools were only visited once and provided with supplies for 2 – 3 months. School health nurses also supplied toothbrushes and toothpaste that was provided by the Department of Health to the schools but on further investigation it was revealed that this also occurred once a year and discontinued thereafter. Moreover, this practice was not afforded to all the districts. From the focus group discussions it was discovered that numerous schools were unaware of the supply of toothbrushes and toothpaste offered by Colgate World of Care and the Department of Health. Hence, it can be assumed that the supply of toothbrushes and toothpaste would depend largely on the availability of staff and resources in the district and the initiative undertaken by the school health nurses and oral health personnel in their respective districts.

The availability of funding for the sustainability of programmes is imperative.[32] Although there are strategies in place for school-based oral health interventions in South Africa, the implementation will be dependent on whether there is funding and materials available to sustain the programme. Findings in this study indicate that the schools did not have a dedicated budget for health and oral health promotion from the Department of Education. This was further verified with baseline data obtained in phase 1 of the study. These findings are further corroborated by Peterson and Kwan (2010) who claimed that limited national budgets in countries worldwide impacted on the implementation of integrated health promotion.[32] However, a recent global survey conducted by the World Health Organizationin 2012 indicated that school-based oral health programmes were most commonly subsidised by national and provincial government.[35] However, this was not evident in this province. Considering the high burden of disease in KwaZulu-Natal and priority being given to this in terms of funding, attempts should therefore be made to secure funding outside the public sector in South Africa.[36] Moreover, with constraints on financial support, it is imperative to focus on evidence-based interventions that are effective. This can

be achieved by incorporating oral health into general health to ensure positive gains from invested resources.[35]

A review of the context of oral health service delivery at schools in KwaZulu-Natal depicts an inequality and inequity in resource allocations. All schools in this study identified challenges experienced with the securing of resources for their programmes. Proper access to water was required for the tooth brushing programme. This invariably posed an obstacle for some schools as the availability of water continues to be a challenge especially in the Umkhanyakude, Sisonke and Umzinyati districts.[37]

Study findings also indicated that educators had difficulty storing the toothbrushes hygienically and also complained about the lack of proper cups and basins for rinsing. Labelling and distributing the tooth brushes was also time consuming and therefore impacted on their teaching time. For the tooth brushing programme to be successful careful thought has to be given to providing adequate resources to address this problem so that educators would be more willing to conduct these programmes.

This study has demonstrated that a school-based intervention could have a positive impact on oral health for learners and communities by providing an opportunity for a holistic approach to healthy lifestyles and environments.[35] This study provides a broad overview of what is currently in place in terms of school based oral health interventions in KwaZulu-Natal. Although the outcome data for this study is short term, evidence in the literature suggests that school based tooth brushing programmes have made a positive impact on children's oral health.[13] This is also evident in a study conducted in Scotland were long-term outcome data was obtained in a study over a two year period. Study results revealed that the tooth brushing programme had a positive effect on the learners, showing a decrease in the prevalence of caries.[38]

C**onclusions**

The results in this study suggest that the school setting has the potential to deliver integrated preventive and promotive programmes. The intervention implemented in this study had created awareness to oral health for learners, educators and parents in the short term. This suggests that if similar programmes are provided with adequate support such as funding and resources, they can in the long term have a positive impact on the oral health of communities in KwaZulu-Natal.

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The next chapter will discuss the conclusions according to the objectives and research questions. The relevant recommendations as they emanated from the analysis will then be presented.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusion

Oral diseases have become a major public health concern because of its high prevalence and the impact it has on public health services and quality of life. Although many oral diseases are preventable, priority is not being given currently to the promotion of oral health and the prevention of oral diseases.

The intended aims and objectives of the study have been accomplished to some extent although some limitations were encountered.

The aim of the study was to critically assess the viability of integrating oral health promotion elements within the Health Promoting School Initiative by developing a systematic approach using a framework to implement and evaluate the programme. This aim was achieved by developing and using a conceptual framework to integrate oral health promotion within the context of the Health Promoting School Initiative. This framework provided a systematic and negotiated approach for the planning, implementation and review of the oral health promotion intervention based on the needs of the six year old learners at the identified schools. It was necessary to implement a tooth brushing programme to assess the feasibility of programme implementation. The strength of this framework was underpinned in its multi-level approach to ensure quality of oral health care delivery. The limitations of this framework were that it was not tested for effectiveness to bring about behaviour change as a result of time constraints. Additionally, the cost-effectiveness of this framework was not investigated.

The first objective of the study was to identify current policies or priorities for health promotion and oral health promotion. The research findings in this study indicate that all (100%) current policies and strategic plans examined have prioritised primary prevention and promotion, integrated approach and the common risk factor approach. However, findings in this study indicate that not all these strategies have been translated into practice. Evidence obtained in this study suggests that current oral health services are inconsistent and fragmented.

The second objective was to conduct a situational analysis and epidemiological profile to determine unmet oral health needs. The study findings suggest that currently 50% of the rural schools have an

inadequate supply of water and proper sanitation. The study findings further indicated that the majority (71.4%) of the schools in the rural areas had access to a community clinic. However, resources were limited in these clinics and poor road conditions and transport prevented the learners from attending these clinics. The evidence suggests that there are inconsistencies in the frequency of oral health services at schools. Although 72.7% of the participants indicated that there were oral health services in place, study findings indicated that these services occurred only once a year in 65% of the schools and once at one of the schools. School health services were only available to 87% of the schools suggesting inequalities of services at district level. The majority of the study participants further indicated that oral health promotion was not included in the curriculum (83%) and that they did not receive teacher training (100%). The majority (87%) of the schools currently have limited control over what is being sold at their tuck shops and by vendors. All schools (100%) indicated a lack of support from the Department of Education in terms of funding for oral health promotion programmes.

The study findings from the oral health screening indicated that 27% of the six year old children were caries free and had a caries rate of 73%. Overall 94% of the learners required some type of treatment with the majority (90%) requiring preventive care. The mean confidence score for caries in the upper and lower teeth was 2.79 and 3.45 respectively with a standard deviation of 3.12. The dental caries results from this study were compared to the results from the National Oral Health Survey conducted in 1999-2002. The study findings indicated an increase in the prevalence of caries from 64.8% to 73% for six-year-olds in KwaZulu-Natal with most districts presenting with high dmft scores. There was also an increase in the mean dmft score for the eThekweni district from 3.42 to 4.55. The study findings indicated an increase in the decayed component from 2.79 to 3.13 and a decrease in the fillings component from 0.15 to 0. This suggests that dental caries has not been adequately addressed in KwaZulu-Natal and that there is a decrease in oral health service provision for restorative procedures. The decrease in fillings could be as a result of only extractions being offered at primary health care centres (Singh et al., 2010). There is therefore a need for an improvement in oral health service delivery. The increase in decayed teeth suggests that children, parents and caregivers should be targeted for preventive services.

The third objective was to identify the presence or absence of school-based oral health promotion programmes at Health Promoting Schools. Although the evidence suggested that there were oral health promotion programmes present at 72.7% of the schools, further investigation revealed that these programmes were inconsistent. Therefore these schools were included in the programme. Findings in this study suggest that School Health Services were only available at 87% of the schools due to staff shortages and high workloads. Priority was therefore given to immunisation and other childhood health conditions depending on the burden of disease. Educators were also not trained to

continue with oral health promotion activities in the absence of school health nurses. All participants (100%) further indicated a lack of funding from the Department of Education to sustain these programmes.

The fourth objective was to introduce a framework for integrated oral health services in schools where there were no or interrupted oral health promotion activities. The findings in this study indicated inconsistencies in oral health promotion activities, therefore all schools in the study sample were invited to partake in the research study. Of the twenty three schools, two schools refused to partake in the research project due to time constraints in their teaching programme and one school was excluded because they had not completed the questionnaire from the first phase. The fourth objective was therefore achieved at twenty of the schools. A tooth brushing programme and integration of oral health education into the school curriculum was introduced at all schools. Educators were also advised on the sale of healthy foods in the school tuck shops and by vendors.

The fifth objective was to determine the opportunities and barriers to the incorporation of oral health promotion within the Health Promoting School Initiative. The research findings revealed that although the school setting provided an ideal platform for the incorporation of oral health promotion, several barriers still impeded its successful implementation. All participants (100%) in this study indicated that oral health was not specifically included in the curriculum. Moreover all (100%) participants (educators) and school health nurses were not adequately trained in oral health promotion. This invariably impacted on the implementation and success of oral health promotion programmes at schools. The majority (70%) of the participants further indicated time constraints and commitment to the recommended syllabus from the Department of Education prevented the implementation and sustainability of oral health promotion activities at schools. The sustainability of these programmes was also dependent on funding. All (100%) schools indicated a lack of support in terms of funding from the Department of Education. Due to financial constraints in businesses and poverty experienced by parents, there was also no community support to sustain the programme. Further findings in this study indicated that there was a lack of resources and capacity. Additionally, there was poor infrastructural support for the sustainability of these programmes. The high burden of disease in KwaZulu-Natal has also contributed to oral health not being prioritised in this province.

The sixth objective was to compare this framework to schools that have existing oral health promotion programmes. This objective could not be achieved as there were inconsistencies in the frequency of oral health promotion programmes at schools. The research findings revealed that oral health promotion programmes occurred only once at one of the schools and once a year in 65% of the schools. There was therefore no available data to compare with this study.

Several assumptions were made at the beginning of the study. In response to these assumptions the study findings indicated that:

1. The assumption that the Health Promoting School is designed to develop competencies in understanding and influencing lifestyles and living conditions of children and young people is correct. However, this study also demonstrated various limitations to this approach.
2. The assumption that the school as a setting provides a significant platform for health and oral health promotion programmes is correct. However, study findings indicate that there are several barriers that impact on its delivery such as the absence or oral health promotion in the curriculum, lack of knowledge on oral health promotion by educators, time constraints and a lack of resources and funding.
3. The assumption that oral health promotion elements are supported in health policy documents in South Africa is correct. However, findings in this study indicate that this has not been translated into practice.
4. The assumption that oral health care is fragmented and not properly integrated within School Health Services in KwaZulu-Natal is correct. This was supported by findings in this study.

Responses to several research questions formulated prior to the study were as follows:

1. The research findings in this study have demonstrated that there is currently inequality and inequity in the delivery of oral health services at Health Promoting Schools.
2. The study findings indicate that oral health service delivery is currently not properly aligned to policy as strategies for oral health promotion have not been translated into practice.
3. There is currently a lack of coordination between the Health Promoting Schools, School Health Services and Department of Education policies and guidelines.
4. The research findings indicate that oral health promotion is not incorporated into general health promotion in the school curriculum.
5. This programme created awareness to oral health for learners, educators, parents and the community. Barriers identified included the absence of oral health promotion in the curriculum, lack of resources and funding and limited knowledge in oral health promotion.

7.2 Recommendations

Opportunities have been identified for the incorporation of oral health promotion into the Health Promoting School Initiative. It is imperative however, to consider the barriers that affect its effective and efficient implementation at these schools. Therefore, this study offers the following recommendations:

- The current focus is on policy formulation and not the translation of policy into sustainable programmes. There is therefore a need for multiple stakeholder involvement in policy monitoring with specific strategies for implementation and evaluation of oral health promotion activities.
- There is a need to ensure stakeholder involvement in the development of oral health learning material at school level.
- More research needs to be done to explore the mechanism to support and address inequity in oral health promotion related service delivery at schools.
- More research needs to be done to test the adaptability of the framework in local health related settings in KwaZulu-Natal and other health related settings nationally.

This reference list has been compiled using the EndNote X7 version of the Harvard author-date system.

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APPENDICES

Appendix 1 – Interview Schedule – Provincial and District Managers

Health/Education Manager – Health promotion

INSTITUTION

Attached please find a list of questions that will be posed to you during the interview. Whilst the questions are fixed, the researcher may ask further questions, based on the original question, in an attempt of gaining clarity or reaching data saturation.

Questions – Health Promotion Managers

1. What are your feelings about oral health being promoted as part of the Health Promoting School Initiative?
2. What are the barriers and obstacles to oral health promotion being introduced to schools?
3. Are you aware whether oral health is covered in the curriculum and are you aware whether staff receive training to teach oral health?
4. Do you know whether oral disease is a particular problem in the local area covered by the Health Promoting School? (What is the extent of the problem?)
5. Does the school have its own Health Promotion or Oral Health Promotion manual? (If so is oral health explicitly or implicitly discussed within it? Where and how is it discussed? Are you aware of any local directives or national directives that support the promotion of oral health in Health Promoting Schools?
6. Does School Health Services or any community organisations support oral health promotion within schools? (What is the current activity of these groups? Is this activity carried out in all schools or selected schools? If selected schools, how are these selected? Are parents or the wider community involved in any school oral health initiatives? Are you aware of any oral health promotion programmes for staff?)
7. Are you aware of any schools that have an oral health policy or an oral health education policy? (Or would these be covered by more general policies?)
8. In your opinion, what influences how and whether Health Promoting Schools engage with oral health promotion?
9. Are schools involved with the Health Promoting School Initiative expected to have healthy eating policy? (Are they expected to follow this through by having healthy foods and drinks available? What about sugar-free foods and drinks? Is drinking water readily available? Do you have control on what is sold by the outside vendors?)
10. Are the students and community involved with decisions at the Health Promoting School?
11. How many schools in the KwaZulu-Natal area involved with the Health Promoting School Initiative? (What percentage of these schools has achieved Health Promoting School Status?

Source: Adapted Oral Health Promotion – An Essential Element of a Health Promoting School (WHO, 2003)

Appendix 2 – Questionnaire – School Principals

INSTITUTION

Date _____

Thank you for taking the time to answer the following questions concerning the Health Promoting School Initiative.

1. Health Promoting School Initiative

a. For how long has the Health Promoting School been implemented?

_____

b. Has this new concept been able to raise community awareness and to what extent?

_____
_____
_____
_____

c. Is it working? YES ☐ NO ☐

d. Please provide a reason and evidence for your answer.

_____
_____
_____
_____

e. In what way do leadership practices contribute to the sustainability of health promotion practices in the Health Promoting School?

_____
_____
_____
_____

2. Oral Health

a. Are there Oral Health Services in place? YES ☐ NO ☐

b. Are there any oral health promotion activities taking place at your school?

YES ☐ NO ☐

c. If yes, what type of activities?

_____
_____

d. What are the challenges and strengths of these activities?

_____
_____
_____
_____

3. School Health Services

a. What are the types of services and activities provided by the School Health Services?

_____
_____
_____
_____

b. Are these services and activities continuous? YES ☐ NO ☐

c. Give a reason for your answer

_____
_____
_____
_____

4. School health education

a. Are any of the following services being offered at your school?

Education ☐ Toothbrushing Programme ☐ Fissure Sealant Programme ☐

Fluoride Mouthrinse ☐ Other ☐

b. What health activities are included into health education?

HIV/AIDS ☐ Nutrition and food safety ☐ Psychological problems ☐

Sexual abuse ☐ Smoking and alcohol ☐ Trauma & violence ☐

Teenage pregnancies ☐ Other ☐

c. Is training for these activities provided to staff?

_____
_____
_____
_____

d. What do teachers and others think of the curriculum? Do they feel comfortable and competent implementing the curriculum?

_____
_____
_____
_____

5. Healthy school environment and security

a. Are there physical security measures in place at the school? YES ☐ NO ☐

b. To what extent are healthy foods offered in the tuckshop?

_____
_____
_____
_____

c. Are there adequate facilities (water) to support oral health activities?

YES ☐ NO ☐

d. Does the school environment comply with health and safety requirements as required by the Health Promoting School Guidelines?

Accessible grounds, buildings and classrooms ☐

Safe water and sanitation ☐

Safe buildings and hazard free environments ☐

Secure buildings and crime free environments ☐

Agricultural enrichment ☐

Recycling facilities ☐

6. Health promotion for school staff?

a. Are there workshops held for staff from the department to support them with health promotion?

_____
_____
_____
_____

b. What are the challenges experienced by the staff for the implementation of health promotion?

_____
_____
_____
_____
_____

7. School and community relationships and collaboration

a. Is the community involved in interventions with the Health Promoting School Initiative?

_____
_____
_____
_____

b. What do parents and the communities think of the oral health promotion efforts?

_____
_____
_____
_____

c. Is there access to oral health service delivery for the community?

YES ☐ NO ☐

d. Is the community involved with any of the following activities?

HIV/AIDS ☐ Nutrition and food safety ☐ Tobacco use ☐

Agricultural ☐ Sexual abuse ☐ Recycling ☐

_____
_____
_____
_____

e. Is the school involved with any collaborative efforts with the community?

YES ☐ NO ☐

f. If yes what are these efforts?

_____
_____
_____
_____

8. Nutrition and food services

a. Is the primary school nutrition programme in place at this school? YES ☐ NO ☐

b. Are the food service providers aware of their role in promoting oral health – substantiate your answer?

YES ☐ NO ☐

_____
_____
_____
_____

9. Physical education and leisure activities

a. How frequently do students and school staff take part in physical exercise programmes?

Daily ☐ Once a week ☐ Twice a week ☐ Other ☐

b. What type of activities does this include?

_____
_____

10. Mental health and well-being

a. Are there any counselling services and support available? YES ☐ NO ☐

b. Are there referrals to specialists? YES ☐ NO ☐

11. Policy

a. Does the school have a comprehensive oral health policy or, if not, policies that relate to oral health? (Please attach copy if yes)

YES ☐ NO ☐

b. Is/are the policy or policies implemented and enforced as written? YES ☐ NO ☐

c. How is policy implemented?

_____
_____
_____
_____

12. Summary

a. What are the barriers faced by the Health Promoting Schools?

_____
_____
_____
_____

b. What are the challenges that are experienced by the Health Promoting Schools?

_____
_____
_____
_____

c. How can Oral Health service delivery be supported or enhanced at your school?

_____
_____
_____
_____

d. How can the Health Promoting Schools Initiative be improved?

_____
_____
_____
_____

Thank you for your invaluable input
Source: Adapted Oral Health Promotion – An Essential Element of a Health Promoting School (WHO, 2003)

Appendix 3 – Data Capture Sheet

Identification Data

Name of school _____

Contact person/Position _____

Address _____

Telephone_____ Fax_____ E-mail_____

1. Geographic Location

Description of area:

Rural ☐ Suburban ☐ Urban ☐ Inner city ☐

2. Ethnic Background of pupils

African ☐ Indian ☐ Coloured ☐ White ☐ Other ☐

3. How would you consider the conditions and environment of the school?

1 2 3 4

POOR NOT GOOD ENOUGH GOOD VERY GOOD

	1	2	3	4
1. Is the environment safe and supportive				
2. Is the classroom a healthy learning environment				
3. Is there adequate furniture				
4. Is there adequate space				
5. Is there artificial and or natural ventilation				
6. Is there artificial or natural light				
7. Cleanliness of classroom				
8. Status of windows, floors, doors				
9. Are classroom rules clearly displayed				
10. Do the health messages form part of the curriculum content				
11. Sanitation or toilet condition or number				
12. Water supply and safety				
13. Refuse disposal:type/bins				
14. Recycling programme in place				
15. General safety & security				
16. Fencing				
17. Road safety				
18. Play ground conditions				
19. Food and flower gardens in place				
20. Trees availability				

4. First Aid Kit

	1	2	3	4
1. Does the school have a first aid tool kit?				
2. Is there a checklist for equipment that it should contain?				
3. Are there clear procedures in place for use of kit?				
4. Is there a procedure for replacing items that are used?				

5. Community support activities

Hospital ☐ Clinic ☐ Police Station ☐ Recreational Facilities ☐

Source: Adapted from WHO checklist for school environment (2003)

Appendix 4 – WHO DMFT Tool

ORAL HEALTH SCREENING FORM

Date	School/Location
Name	Sex: Male ☐ Female ☐
Age	
Race/Ethnicity 1=Black 2=White 3=Indian 4=Coloured	

CARIES STATUS AND TREATMENT NEED

			55	54	53	52	51	61	62	63	64	65			
18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28

			85	84	83	82	81	71	72	73	74	75			
48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38

STATUS

Permanent teeth	Primary teeth
0 = Sound	A
1 = Decayed	B
2 = Filled and decayed	C
3 = Filled, no decay	D
4 = Missing due to caries	E
5 = Missing any other reason	-
6 = Sealant, varnish	F
7 = Bridge abutment or special crown	G
8 = Unerupted tooth	-
9 = Excluded tooth	-

TREATMENT

0 = None
1 = Caries arresting/sealant care
2 = One surface filling
3 = Two or more surface fillings
4 = Crown or bridge abutment
5 = Bridge element
6 = Pulp care
7 = Extraction
8 = Need for other care
9 = (Specify)_____
_____

Source: Department of Health – National Oral Health Survey (1994)

Appendix 5 – Focus Group Discussion Questionnaire

1. What were the opportunities/benefits that you identified to oral health promotion being introduced into schools
2. What were the barriers/challenges that you identified to oral health promotion being introduced into schools
3. What support is available for the interventions that have been implemented?
4. Do you think that introducing oral health promotion as part of the formal curriculum would assist in this program?
5. Do you think that oral health promotion should be included in your training as an educator?
6. Do you think that having a school based health policy in place would assist in this program being conducted on a regular basis? Do you think that the policy should mention oral health in particular?
7. Are you able to control what is being sold at the tuck shop and outside vendors?
8. What strategies can you suggest to coordinate what is being sold at the tuck shop and outside the school?
9. How can we ensure that this is practical to implement?
10. How do budgets affect the implementation and sustainability of the programme?
11. Is there support from the Department of Health/Department of Education
12. What areas of improvement can you suggest for the oral health promotion programme?
13. What are your recommendations for this delivery of service (Oral health promotion programme)

Appendix 6 – Letter for Gatekeeper Permission – Department of Health/Education

A framework for integrated school oral health promotion within the Health Promoting Schools Initiative in KwaZulu-Natal

The Provincial Manager
Kwa-Zulu Natal Department of Education/Health
Date
Dear Sir/Madam
RE: Request to conduct research on oral health promotion at Health Promoting Schools

I am a dental therapist/lecturer currently employed at the University of KwaZulu-Natal-Westville Campus. I am studying part time at the University of KwaZulu-Natal for a Doctoral degree (PhD: Health Sciences). My degree programme requires me to conduct research in my field of interest. The topic for my study is a critical analysis of the Health Promoting School Initiative as a mechanism to improve oral health promotion in KwaZulu-Natal.

The aim of my study is to critically assess the viability of including oral health promotion elements within the framework of the Health Promoting School Initiative, to establish its appropriateness as a mechanism for school-based oral health service delivery.

The objectives of my study will be to identify current policies or priorities in place for health promotion and oral health promotion. I will then determine current oral health practices that are in place at the Health Promoting Schools and then select schools without oral health promotion for the implementation of my programme. The Oral Health Promotion Programme will be based on epidemiological profile and unmet oral health needs and this will be compared with existing models of care at the Health Promoting Schools. The barriers and strengths of oral health promotion within the Health Promoting School Initiative will be identified.

I would like to conduct a situational analysis and implement an Oral Health Promotion programme in consultation with the District Health Office at twenty two Health Promoting Schools in the eleven districts of Kwa-Zulu Natal. The primary source of information will include interviews with the Provincial managers of Department of Health and Education and the Health Promotion Manager, a questionnaire that will be completed by the principals at the identified schools, data capture sheet for assessment of the environment and dental screening. Statistical records, reports, policy documents, record books, minutes from meetings and check lists will be used for data collection.

The study will adhere to all ethical principles. Informed consent will be obtained from all participants in the interviews, with the explicit right to withdraw from the interview at any stage without any negative consequences. The duration of the interview will be forty five minutes and will be either telephonic or face to face.

Permission for the study will also be obtained from the Department of Health/Education.

The results of the study will be disseminated to your department in the form of a report. Please find attached a copy of the research proposal.

Thanking you in anticipation

Regards

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Appendix 7 – Information and consent sheet – Managers

The Manager – Health/Health Promotion

Dear Sir/Madam

Date:

INFORMATION SHEET: A framework for integrated school oral health promotion within the Health Promoting Schools Initiative in KwaZulu-Natal

I am currently studying at the University of KwaZulu-Natal-Westville Campus towards a Doctoral degree (PhD: Health Sciences). I am undertaking a research study to analyse the Health Promoting School Initiative as a mechanism to improve oral health promotion in KwaZulu-Natal.

Poor oral health can affect children's performance in school and their success later in life. Children who suffer with poor oral health miss school. Oral diseases are a major public health problem in South Africa. Dental caries is difficult to treat as a result of access to and availability of oral health services in all districts of KwaZulu-Natal. It is also expensive to treat and is therefore unaffordable to the majority of the people in KwaZulu-Natal. Dental caries can be prevented by changes in diet and lifestyle.

There is therefore a need for oral health planning efforts to focus on reducing the number of oral diseases especially in disadvantaged communities. This can be achieved by promoting healthier lifestyles. The school setting provides the most creative and cost effective way for the improvement of health, oral health and in turn quality of life. It can reach a large percentage of the population in their influential stages of life during which lifelong beliefs, attitudes and skills could be developed.

This study arose out of a need to understand whether the Health Promoting School Initiative could be used as a mechanism for the inclusion of oral health promotion into the curriculum to improve oral diseases in KwaZulu-Natal.

The aim of my study is to critically assess the viability of including oral health promotion elements within the framework of the Health Promoting School Initiative, to establish its appropriateness as a mechanism for school-based oral health service delivery.

An oral health promotion intervention will be implemented at selected Health Promoting Schools based on needs that would include oral health education into the school health education programme, prevention and protection from facial and oral injuries, prevention and

treatment of oral and dental diseases by School Health Services, psychological and social services, healthy school environment and healthy foods.

Participants from management will first be interviewed. The expected length of the interview is 45 minutes. Participants will be notified prior to the interview. All ethical principles will be adhered to. Participation is voluntary and you have the right to withdraw from the study at any time without any penalties. Interviews will be taped recorded and then transcribed. The tapes will be securely stored at the University of KwaZulu-Natal. All participants will be required to give written consent. Confidentiality will be maintained at all times, and you may request that your name or role to remain confidential. There will be no costs incurred by you as well as no compensation for your participation in the study. The results of the research will be made available to you. Should you have any queries regarding the study please feel free to contact me?

Should you be willing to participate in this research, as you have been identified as a key stakeholder, then kindly sign and return the consent form and suggest a list of suitable dates and times for the interview to be scheduled? You will be contacted at regular intervals to ensure your availability.

Thanking you in advance for your participation. It is highly appreciated.

Ms M Reddy
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Cel: 084 584 4288
E-mail: reddym@ukzn.ac.za

Consent sheet for participants for interview

RE: Consent to participate in research project: A framework for integrated school oral health promotion within the Health Promoting Schools Initiative in KwaZulu-Natal

I…… (Full name of participant) hereby confirm that I understand the contents of the information sheet and the research project.

Tick the applicable box [√]

I consent to participating in the research through the completion of an interview with:-

the recording of the interview ☐

do not agree to have the interview tape-recorded ☐

I understand that I am at liberty to withdraw from the research at any stage should I so desire without any negative consequences. I can be contacted for further clarity of information from the study.

_____ _____

Signature of participant Date

_____ _____

Witness Date

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E-mail: ximbap@ukzn.ac.za

Appendix 8 – Information and consent sheet - School Principals

The Principal/Teachers/School Health Team

School

Dear Sir/Madam

Date:

INFORMATION SHEET: A framework for integrated school oral health promotion within the Health Promoting Schools Initiative in KwaZulu-Natal

I am currently studying at the University of KwaZulu-Natal-Westville Campus towards a Doctoral degree (PhD: Health Sciences). I am undertaking a research study to analyse the Health Promoting School Initiative as a mechanism to improve oral health promotion in KwaZulu-Natal.

Poor health including oral health can affect children's performance in school and their success later in life. Children who suffer with poor oral health miss school. Oral diseases are a major public health problem in South Africa. Dental caries is difficult to treat as a result of access to and availability of oral health services in all districts of KwaZulu-Natal. It is also expensive to treat and is therefore unaffordable to the majority of the people in KwaZulu-Natal. Dental caries can be prevented by changes in diet and lifestyle.

There is therefore a need for oral health planning efforts to focus on reducing the number of oral diseases especially in disadvantaged communities. This can be achieved by promoting healthier lifestyles. The school setting provides an ideal and cost effective way for the improvement of health, oral health and in turn quality of life. It can reach a large percentage of the population in their developmental stages of life during which lifelong beliefs, attitudes and skills could be developed.

This study arose out of a need to understand whether oral health promotion could be included into the curriculum to improve oral diseases in KwaZulu-Natal.

The aim of my study is to critically assess the viability of including oral health promotion elements within the framework of the Health Promoting School Initiative, to establish its appropriateness as a mechanism for school-based oral health service delivery.

An oral health promotion intervention will be implemented at your Health Promoting School based on the needs of your school that would include oral health education into the school health education programme, prevention and protection from facial and oral injuries,

prevention and treatment of oral and dental diseases by School Health Services, psychological and social services, healthy school environment and healthy foods.

The principal will be given a questionnaire that will take half an hour to complete; a data capture sheet will be used to assess the environment and a dental screening will be done to assess the oral health needs of the learners. Referrals to nearby clinics if required will be done. Interviews will be conducted at the end of the study with the principal and School Health Forum. All ethical principles will be adhered to. Participation is voluntary and you have the right to withdraw from the study at any time without any penalties. Confidentiality will be maintained at all times, and you may request that your name or role remain confidential. There will be no costs incurred by you as well as no compensation for your participation in the study. The results of the research will be made available to you. Should you have any queries regarding the study please feel free to contact me?

Should you be willing to participate in this research, as you have been identified as a key stakeholder, then kindly sign and return the consent form so that a questionnaire can be sent to you?

Thanking you in advance for your participation. It is highly appreciated.

Ms M Reddy
Telephone: 031 - 260 8270
Cel: 084 584 4288
E-mail: reddym@ukzn.ac.za

Consent sheet for participants for questionnaire and interview at end of study

The Principal/School Health Team

RE: A framework for integrated school oral health promotion within the Health Promoting Schools Initiative in KwaZulu-Natal

I…… (Full name of participant) hereby confirm that I understand the contents of the information sheet and the research project.

Tick the applicable box [√]

I consent to participating in the research through the completion of a questionnaire ☐

I do not consent to participating in the research ☐

I understand that I am at liberty to withdraw from the research at any stage should I so desire without any negative consequences. I can be contacted for further clarity of information from this interview.

_____ _____

Signature of participant Date

_____ _____

Witness Date

Ms M Reddy
Telephone: 031 - 260 8270
Cel: 084 584 4288
E-mail: reddym@ukzn.ac.za

Supervisor: Dr. S. Singh
Discipline of Dentistry
School of Health Sciences
University of KwaZulu-Natal
Telephone: 031- 2426214, Mobile: 073 8417384, Fax: 031-260 8069
E-mail: singhshen@ukzn.ac.za

University of KwaZulu- Natal Research office contact details:
Ms. Phumelele Ximba: Research Office
University of KwaZulu-Natal-Westville Campus
Private bag X54001
Durban, 4000, South Africa
Telephone: (+27) 31 - 260 3587, Fax No. : (+27) 31 2602384
E-mail: ximbap@ukzn.ac.za

Appendix 9 – Information and consent sheet – Parents (IsiZulu)

Ulwazi lwababambiqhaza
Abazali/Izingane
Isikole
Sawubona Mnumzane/Nkosikazi
Usuku:

IPHESHANA LOLWAZI: Uhlaka lwezikole ezididiyelwe ezigqugquzela ukuba nomlomo ophilile ngaphansi kwesinyathelo sezikole ezigquqguzela ezempilo KwaZulu-Natali

Ngifunda eNyuvesi yaKwaZulu-Natali ekhempasini yaseWestville lapho ngenza khona iziqu zobuDokotela kwezeMpilo. Ngenza ucwaningo lokucubungula uMkhankaso Wokugqugquzela Ezempilo Ezikoleni njengengxenye yokuthuthukisa ukunakekelwa kwamazinyo KwaZulu-Natali.

Impilo engenhle okubandakanya neyamazinyo ingakhinyabeza ukufunda kwezingane kanye nokuthuthuka kwabo esikhathini esizayo. Izingane eziguliswa amazinyo, ziyalova esikoleni. Izifo eziba semlonyeni ziyinkinga enkulu eNingizimu Afrika. Ukubola kwamazinyo kuyinto okungelula ukuyelapha ngenxa yokungabi khona noma ukufinyelela kalula ezinsizeni zokunakekelwa kwamazinyo kuzo zonke izifunda zaKwaZulu-Natali. Kuyabiza nokukwelapha ngakho-ke akuwona wonke umuntu ongakwazi ukukwelapha. Ukubola kwamazinyo kungagwemeka ngokushintsha indlela yokuphila kanye neyokudla.

Kunesidingo esikhulu sokuhlelela imizamo yokunakekela impilo yamazinyo okuzogxila ekwehliseni isibalo sezifo zasemlonyeni ikakhulukazi kuleyo miphakathi encishwe amathuba. Lokhu kungazuzwa ngokuthi kwenziwe inhlalo enempilo. Isikole siyisizinda esikahle lapho kungathuthukiswa khona izinga lempilo, impilo yamazinyo kanye nempilo enhle. Kungafinyelela kubantu abaningi ikakhulukazi labo abasakhula ngoba kuyobe sekutshalwe kubo izinkolelo zengunaphakade nendlela yokubuka izinto kanye namakhono angathuthukiswa.
Lolu cwaningo lwenziwa ngenxa yesidingo sokuqonda ukuthi ngabe ukugqugquzela impilo enhle yamazinyo kungaba yini yingxenye yohlelo lwezifundo ukuze kwehliswe izinga lezifo zasemlonyeni lapha KwaZulu-Natali.

Inhloso yalolu cwaningo ukuhlola ukuthi kungaba njani uma Ohlelweni Lokuthuthukisa Ezempilo Ezikoleni kungafakwa ezokuthuthukisa impilo yasemlonyeni, ukubheka ukuthi kungalunga yini uma lokhu kuhlolwa kuzohlinzekwa ezikoleni.

Umngenelelo wokugqugquzela amazinyo anempilo uzoqaliswa Esikoleni Sakho Esithuthukisa Ezempilo ngokubheka izidingo zesikole sakho ezizobandakanya ukufundisa ngamazinyo anempilo ohlelweni lwezempilo esikoleni, ukugwema kanye nokwelapha ukulimala kwasebusweni, emlonyeni nokwamazinyo kwenziwa abezeMpilo eSikoleni, abezeNgqondo kanye neNhlalo, inhlalo enempilo esikoleni kanye nokudla okunempilo.

Uthishanhloko uyonikwa uhlu lwemibuzo ukuze ayiphendule; ipheshana liyosetshenziswa ukuhlola isimo sendawo bese kuhlolwa amazinyo ukuze kubhekwe izidingo zempilo emilonyeni yezingane. Ziyokwedluliselwa emitholampilo eseduzane uma kudingekile. Kuyokwenziwa izingxoxo ngasekupheleni kwalolu cwaningo zenziwa nomphathisikole kanye neForamu YezeMpilo Esikoleni. Kuyolandelwa yonke imigudu efanele yenkambiso okuyiyona yona yokuqhuba ucwaningo. Awuphoqiwe ukubamba iqhaza kulolu cwaningo, unelungelo lokuyeka ukuba yingxenye yalolu cwaningo nganoma yisiphi isikhathi ofuna ngaso ukuyeka futhi ungahlawuliswa lutho. Ukugcina lokhu kuyimfihlo kuyoqikelelwa ngaso sonke isikhathi, ungacela ukuthi igama lakho noma iqhaza lakho lingadalulwa. Akukho zindleko ezingakufaka ezikweletini kanjalo futhi akukho sinxephezelo ngokubamba kwakho iqhaza ocwaningweni. Ucwaningo lwethemba ukuthi luzozuza ukulethwa kwezidingo zomphakathi ngokuhlanganyela okugculisa kakhulu kanye nokungcono kokuba nomlomo ophilile emazingeni ezikole. Uyokwaziswa ngemiphumela yocwaningo. Uma uneminye imibuzo ngalolu cwaningo ungesabi ukungithinta.

Uma ufisa ukubamba iqhaza kulolu cwaningo sicela usayine bese ubuyisa ifomu lemvume.

Sibonga kakhulu ukuvuma kwakho ukuba yingxenye yalolu cwaningo.

Nks M Reddy
Ucingo: 031 - 260 8270
Iselula: 084 584 4288
I-imeyili: reddym@ukzn.ac.za

UMeluleki: Dr. S. Singh
Discipline of Dentistry
School of Health Sciences
University of KwaZulu-Natal
Ucingo: 031- 2426214, Iselula: 073 8417384, iFeksi: 031-260 8069
I-imeyili: singhshen@ukzn.ac.za

University of KwaZulu- Natal Research office contact details:
Ms. Phumelele Ximba: Research Office
University of KwaZulu-Natal-Westville Campus
Private bag X54001
Durban, 4000, South Africa
Telephone: (+27) 31 - 260 3587, Fax No. : (+27) 31 2602384
E-mail: ximbap@ukzn.ac.za

Ukuhlolwa kwamazinyo kuzokwenziwa esikoleni sengane yakho. Iphepha lolwazi elichaza ngohlelo linanyathiselwe. Imvumo icelelwa ukuba ingane yakho ibambe iqhaza ekuhlolweni kwamazinyo esikoleni sabo. Sicela ugcwalise leli fomu bese ulibuyisela kumfundisi wengane yakho kusasa. Siyabonga

IMVUME YOMZALI

Mina _____ ngitsheliwe ngocwaningo olunesihloko esithi Uhlaka lwezikole ezididiyelwe ezigqugquzela ukuba nomlomo ophilile ngaphansi kwesinyathelo sezikole ezigquqguzela ezempilo KwaZulu-Natali ngu _____.

Ngiyayiqonda inhloso kanye nezinqubo zocwaningo.

Nginikeziwe ithuba lokuphendula imibuzo ngocwaningo futhi iphendulwe ngendlela engigculisayo.

Ngiyavuma ukuthi ukubamba kwami iqhaza kulolu cwaningo kungukuzithandela ngokugcwele futhi ngingahoxa noma yingasiphi isikhathi.

Ngazisiwe ukuthi azikho izindleko ezingangifaka ezikweletini ezizobhekana nami nokuthi akukho ukunxeshezelwa ngokubamba kwami iqhaza kulolu cwaningo.

Uma nginanoma yimiphi imibuzo/imibono ngaphezulu ehlobene nocwaningo ngiyaqonda ukuthi ngingaxhumana nomcwaningi ku-031 2608270 noma 0845844288.

Uma nginanoma yimiphi imibuzo noma imibono mayelana namalungelo ami njengombambiqhaza ocwaningweni, noma uma nginokungaboni kahle ngengxenye yocwaningo noma abacwaningi ngingaxhumana no: Ms.PhumeleleXimba: Research Office 031 - 260 3587

Igama lengane	Iminyaka yengane
☐ Yebo, ngiyavuma ukuba kuhlolwe amazinyo engane yami	
☐ Cha, angivumi ukuba kuhlolwe amazinyo engane yami	
_____ Isiginesha yomzali/umqaphi	_____ Usuku
_____ Ufakazi	_____ Usuku

Appendix 10 – Information and consent sheet – Parents (English)

School

Dear Parent

Date:

INFORMATION SHEET: A framework for integrated school oral health promotion within the Health Promoting Schools Initiative in KwaZulu-Natal

I am currently studying at the University of KwaZulu-Natal-Westville Campus towards a Doctoral degree (PhD: Health Sciences). I am undertaking a research study to analyse the Health Promoting School Initiative as a mechanism to improve oral health promotion in KwaZulu-Natal.

Poor health including oral health can affect children's performance in school and their success later in life. Children who suffer with toothache miss school. In some districts in KwaZulu-Natal it is difficult to treat toothache as there are no clinics nearby as well as a lack of staff for these clinics. Toothache can be prevented by changing the way we eat and the way in which we take care of our teeth.

The aim of my study is to critically assess whether oral health promotion elements could be included within the framework of the Health Promoting School Initiative and to establish whether this would work.

My study is aimed at introducing a dental health programme at school that will try to include all other health needs for your child. Therefore we as health workers want children to recognise that the mouth is part of the body, therefore care of the teeth and gums should be part of general health care.

In order to plan this dental health programme, we need to collect information about your child's dental health. We will need to check his/her teeth and gums to see if there are any problems with them. We will not use any instruments in your child's mouth. This dental check-up is done in the same way when nurses come to check children's teeth at schools.

Should you child require further dental management, he/she will be given a referral letter. You will then be able to take your child to the dental clinic or hospital that is closest to you.

If the nearest dental clinic is located within a hospital setting, you will be required to pay the outpatient admission fees, that is based on your income.

All ethical principles will be adhered to. Participation is voluntary and your child has the right to withdraw from the study at any time without any penalties. Confidentiality will be maintained at all times, and your child's name will not be mentioned in any document. There are no direct benefits to you but the study hopes to contribute to a more efficient and better co-ordinated service delivery for oral health at school level. The results of the research will be made available to you via a report that will be sent to the school principal. There is no compensation for your participation in the study. Should you have any queries regarding the study please feel free to contact me?

Thanking you in advance for your participation. It is highly appreciated.

Ms M Reddy
Telephone: 031 - 260 8270
Cel: 084 584 4288
E-mail: reddym@ukzn.ac.za

Supervisor: Dr. S. Singh
Discipline of Dentistry
School of Health Sciences
University of KwaZulu-Natal
Telephone: 031- 2426214, Mobile: 073 8417384, Fax: 031-260 8069
E-mail: singhshen@ukzn.ac.za

University of KwaZulu- Natal Research office contact details:
Ms. Phumelele Ximba: Research Office
University of KwaZulu-Natal-Westville Campus
Private bag X54001
Durban, 4000, South Africa
Telephone: (+27) 31 - 260 3587, Fax No. : (+27) 31 2602384
E-mail: ximbap@ukzn.ac.za

PARENTAL CONSENT

I _____ have been informed about the study entitled A framework for intergrated school Oral Health Promotion within the Health Promoting Schools Initiative in KwaZulu-Natal by _____.

I understand the purpose and procedures of the study.

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my child's participation in this study is entirely voluntary and that I may withdraw at any time.

I have been informed that there is no compensation for my participation in the study.

If I have any further questions/concerns or queries related to the study, I understand that I may contact the researcher at 031 2608270 or 0845844288.

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact: Ms. Phumelele Ximba: Research Office 031 - 260 3587.

Child's Name	Child's Age

☐ Yes, I give permission for my child to have his/her teeth checked

☐ No, I don't give permission for my child to have his/her teeth checked

_____ _____

Signature of Parent/Guardian Date

_____ _____

Witness Date

Appendix 11 – Memorandum of Understanding

Ms M. Reddy and _____, school principal of _____ school.

The purpose of this MOU is to define and outline the responsibilities of Ms M. Reddy and _____ (school) in order to provide oral health promotion at the school site.

The school will undertake the following for the implementation of an oral health promotion programme

- The school will be ultimately responsible for the implementation and maintenance of the programme.
- The school will decide when the programme is to be implemented, how it is to be implemented, who will be responsible for overseeing the programme, how and who will monitor and evaluate the programme and whom to contact if there is a problem.
- The school will develop and implement policies for oral health promotion.
- The school will form partnerships with various stakeholders.
- The school will arrange workshops for teachers/educators to provide professional development and in service training on oral health issues.
- The school will introduce oral health promotion into the curriculum.
- The school will arrange for oral health services access at or near the school site.
- The school will ensure that the food service programme, tuck-shop and vendors support good oral health.
- The school will encourage parent and community involvement.
- The school will determine what measures and indicators will be used to assess programme effectiveness.

Responsibilities of Ms M. Reddy is to

- Facilitate the research project by providing advice and guidance whenever required.
- Evaluate the programme after 6 months.

SIGNATURES

_____	_____
School Principal	**Date**
_____	_____
Ms M Reddy	**Date**

Appendix 12 – Ethics Approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

5 September 2013

Mrs Moganavelli Reddy 8116281
School of Dentistry
Westville Campus

Protocol reference number: HSS/0509/013D
Project title: A framework for integrated school oral health promotion within the Health Promoting Schools Initiative in KwaZulu-Natal

Dear Mrs Reddy

Full Approval – Expedited

This letter serves to notify you that your application in connection with the above has now been granted full approval.

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach/Methods must be reviewed and approved through an amendment /modification prior to its implementation. Please quote the above reference number for all queries relating to this study. Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

Best wishes for the successful completion of your research protocol.

Yours faithfully

.....
Dr Shenuka Singh (Acting Chair)

/px

cc Supervisor:
cc Academic Leader Research: Prof J van Heerden
cc School Administrator: Ms P Nene

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Acting Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban, 4000, South Africa
Telephone: +27 (0)31 260 3587/8350/4557 **Facsimile:** +27 (0)31 260 4609 **Email:** ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukn.ac.za
Website: www.ukzn.ac.za
Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

Appendix 13 – Gatekeeper Permission - Department of Health

health

Department:
Health
PROVINCE OF KWAZULU-NATAL

Health Research & Knowledge Management sub-component
10 – 103 Natalia Building, 330 Langalibalele Street
Private Bag x9051
Pietermaritzburg
3200
Tel.: 033 – 3953189
Fax.: 033 – 394 3782
Email.: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

Reference : HRKM169 /13
Enquiries: Mrs G Khumalo
Telephone : 033 – 395 3189

12 August 2013

Dear Mrs M Reddy

Subject: Approval of a Research Proposal

1. The research proposal titled **'A framework for integrated school oral health promotion within the health promoting schools initiative in KwaZulu-Natal'** was reviewed by the KwaZulu-Natal Department of Health.

The proposal is hereby **approved** for research to be undertaken at KZN-DoH (Health Promotion Unit) .

2. You are requested to take note of the following:
   a. Make the necessary arrangement with the identified facility before commencing with your research project.
   b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.

3. Your final report must be posted to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mrs G Khumalo on 033-395 3189.

Yours Sincerely

Dr. E Lutge
Chairperson, KwaZulu-Natal Health Research Committee
Date: 21/08/2013

Appendix 14 – Gatekeeper Permission – Department of Education

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

Enquiries: Sibusiso Alwar | Tel: 033 341 8610 | Ref.:2/4/8/468

Ms Moganavelli Reddy
P O Box 19110
Dormerton
4015

Dear Ms Reddy

PERMISSION TO CONDUCT RESEARCH IN THE KZN DoE INSTITUTIONS

Your application to conduct a pilot and research entitled: **A FRAMEWORK FOR INTEGRATED SCHOOL ORAL HEALTH PROMOTION WITHIN THE HEATH PROMOTING SCHOOLS INITIATIVE IN KWAZULU-NATAL,** in the KwaZulu-Natal Department of Education Institutions has been approved. The conditions of the approval are as follows:

1. The researcher will make all the arrangements concerning the research and interviews.
2. The researcher must ensure that Educator and learning programmes are not interrupted.
3. Interviews are not conducted during the time of writing examinations in schools.
4. Learners, Educators, Schools and Institutions are not identifiable in any way from the results of the research.
5. A copy of this letter is submitted to District Managers, Principals and Heads of Institutions where the intended research and interviews are to be conducted.
6. The period of investigation is limited to the period from 01 August 2013 to 31 August 2015.
7. Your research and interviews will be limited to the schools you have proposed and approved by the Head of Department. Please note that Principals, Educators, Departmental Officials and Learners are under no obligation to participate or assist you in your investigation.
8. Should you wish to extend the period of your survey at the school(s), please contact Mr. Alwar at the contact numbers below.
9. Upon completion of the research, a brief summary of the findings, recommendations or a full report / dissertation / thesis must be submitted to the research office of the Department. Please address it to The Director-Resources Planning, Private Bag X9137, Pietermaritzburg, 3200.
10. Please note that your research and interviews will be limited to the following school/s and/or institution/s in the KwaZulu Natal Department of Education.

Mdlasi Primary	**Port Shepstone Sec**	**Fairleigh Primary**	**T.P.A. Primary**
Endumeni Primary	**Clavis Primary**	**Cebelihle Primary**	**Bay Primary**
Velankosi Primary	**Thegisangaye Primary**	**Echwebeni Primary**	**Ezimbindleni Primary**
Phalane Primary	**Phalane Primary**	**Nophungwa Primary**	**Nokubusa Primary**
Greenbury Primary	**Zakhele Primary**	**Ixopo Primary**	**Masongo Primary**
Mashesheleng Primary	**ML Sultan Primary**	**Colenso Primary**	**ML Sultan Ladysmith Primary**

Nkosinathi S.P. Sishi, PhD
Head of Department: Education
16 August 2013

...dedicated to service and performance
beyond the call of duty

KWAZULU-NATAL DEPARTMENT OF EDUCATION
POSTAL: Private Bag X 9137, Pietermaritzburg, 3200, KwaZulu-Natal, Republic of South Africa
PHYSICAL: Office G25, 188 Pietermaritz Street, Pietermaritzburg, 3201. Tel. 033 3418610 Fax : 033 341 8612
EMAIL ADDRESS: sibusiso.alwar@kzndoe.gov.za; CALL CENTRE: 0860 596 363;
WEBSITE: www.kzneducation.gov.za

Appendix 15 – Language Clearance Certificate

25 Maple Crescent
Circle Park
KLOOF
3610

Phone 031 – 7075912
0823757722
Fax 031 - 7110458
E-mail:
wyebanksec@telkomsa.net
sathsgovender4@gmail.com

Dr Saths Govender

31 OCTOBER 2015

LANGUAGE CLEARANCE CERTIFICATE

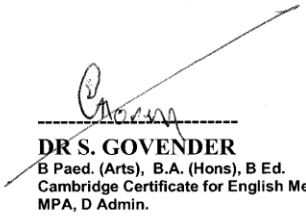
TO WHOM IT MAY CONCERN

This serves to inform that I have read the final version of the thesis titled:

A FRAMEWORK FOR INTEGRATED SCHOOL ORAL HEALTH PROMOTION WITHIN THE HEALTH PROMOTING SCHOOLS INITIATIVE IN KWAZULU-NATAL by M. Reddy.

To the best of my knowledge, all the proposed amendments have been effected and the work is free of spelling and grammatical errors. I am of the view that the quality of language used meets generally accepted academic standards.

Yours faithfully



DR S. GOVENDER
B Paed. (Arts), B.A. (Hons), B Ed.
Cambridge Certificate for English Medium Teachers
MPA, D Admin.