**IMPACT OF WATER, SANITATION, AND HYGIENIC INTERVENTIONS ON IMPROVING HEALTH OUTCOMES AMONG SCHOOL GOING**

**CHILDREN IN PUNTLAND-SOMALIA**

**BY**

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***A research work submitted in partial fulfilment of the requirements for the diploma***

***In Water, hygiene and Sanitation Africa Institute for Project***

***Management Studies (AIPMS)***

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# DECLARATION AND APPROVAL

I declare that this is my original research work and has not been submitted in any college whatsoever for a certification apart from*Africa Institute for Project* Management *Studies (AIPMS)*

**Sign:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dr.**Abdiqani Sheikh Omar

This research study has been done and submitted with my approval as the college Supervisor

**Sign:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Ms** Irene oget

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# **ABSTRACT**

As part of promotion of hygienic interventions and general body health, it can be easy to conduct it in places where the entire population live, play, work and learn, this is the most creative, simple, clear and cost effective way to improve hygienic interventions which later leads to good living. The biggest problem is considering the fact that in some communities, a school may be the only place where children can carry out hygienic interventions practice. By the help of their teachers and school health programs, it is therefore important that sufficient safe water and sanitation facilities are provided in schools.OB1: To asses tooth brushing practice among school going children age 7 to 14 in Puntland-Somalia:OB2: To assess hygienic interventions seeking behavior among children attending primary schools between ages 7 to 14 years in Puntland-Somalia and OB3: To determine the importance of hygienic interventions among the children between ages 7 to 14 years in Puntland-Somalia.The researcher chose a cross-sectional design to carry out the research. Simple random sampling technique was used to select five schools were selected. A total of 384 pupils aged between 7 and 14 years were selected. The researcher used questionnaires to collect data. This survey is targeting to find out the impact of water, sanitation and hygienic interventions on improving health outcomes among School going children in Puntland Somalia. The study used a cross-sectional research design with both qualitative and quantitative research design. The study used a cross-sectional research design with both qualitative and quantitative research design. The quantitative research design measures the degree of association between the dependent variables and the dependent variable while the descriptive research design was used to describe the phenomenon. The simple random sampling method was used to get names of the schools which took part in the study (study population) a list of all primary schools to be used in the study was driven from Puntland region. The researcher coded data after modeling into a form that tallied with the objectives of the study. These included straight forward means; standard deviations, recurrence tables, relationships and relapse investigation with the guide of SPSS (version 23).The survey found that none of the respondents had ever used dental floss, this could be attributed to the fact that dental floss is expensive, and also not available in the local market. Lack of oral health education in schools can also explain this. The study recommends that School children should be given oral health education through the curriculum and awareness campaigns and also oral health promotion programs for parent; children should be organized, oral health providers should work with school authorities to organize for such campaigns.

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# OPERATIONAL DEFINITIONS

**Oral hygiene-** this is the maintenance of cleanness in all the structures in the mouth.

**Awareness-** this is the level of knowledge or know-how of a person.

**Practice**- this is the ability of a person to repeat something again and again.

# LIST OF ABBREVIATIONS

**WHO**- World health organization.

**MOH**- Ministry of health.

**NHSSP**- National health sector strategic plan.

**NGO**- Non-governmental organizations

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# CHAPTER ONE: INTRODUCTION

## 1.1Background to the Study

In the whole World, millions of hours are lost annually from school; this is mainly contributed by oral diseases caused by lack of water, sanitation, and hygienic interventions as well as general body health (WHO 2003). Health promotion deals with factors leading to improvement of health and those factors that seek to reduce risks through sensitive policies and actions. When the community is involved in the project, it gives them ownership and the spirit to give assistance to the project for the whole duration. Their involvement in the project helps them exercise their skills and knowledge acquired by different groups of people Middlestadt, et al, (2018). For proper implementation and planning of a project, the local groups should be engaged and since they may lack the technical know-how of the project it could be necessary to offer them training first on the project for its success thus according to Sremakaew, et al, (2018). Educating the community on the importance of the project is also important for the project and also offering promotions for some of the members of the community might encourage them more to work for the project for good results Doyle, et al, (2018).

Worldwide over 850 million have no access to clean water supply with 2.5 billion having been limited by access to sanitation facilities. According to the World Health statistics review which was done in 2009 indicated that India was the leading due to diarrhea diseases with more than 386,000 diarrheal deaths Daigger, G. T. (2009). Egypt is not left behind among the countries listed with children with less than five years old with the leading rate of infant mortality rate due to hygienic interventions that are caused by lack of water for conducting proper oral hygiene. Water Safety Plans is an improved risk management instrument designed to guarantee the protection of drinking water through the use of a complete risk evaluation and risk management approach that covers all steps in water supply from the source to the sources thus according to Proskuryakova, et al, (2018). It enables operators identifying and controlling risks rather than just analyzing them, it Fosters teamwork, planning, coordination and documentation and also it ensures a holistic approach to ensure safe drinking water from catchment to consumers.

Lack of water, sanitation, and hygienic interventions causes poor hygienic interventions is the act of cleaning structuring and maintaining good standards of cleanliness to all structure of the oral cavity, may it be soft or hard tissue to prevent disease manifestation in the mouth. Hygienic interventions are important for the factions of Mastication, esthetic beauty, and speech Kwan, et al, (2005). Children with poor hygienic interventions can have a detrimental effect on their academic performance in school. Their co-curriculum activities can also be affected, which can later affect their success in life. Children who suffer from poor hygienic interventions are many times more likely to have restricted activities compared to children who are with good hygienic interventions and maintain the same; some of those disadvantages included missing to school to seek for oral treatment such as extraction or carious painful teeth and treatment of other periodontal diseases (Developing dentistry 2014).

As part of the promotion of hygienic interventions and general body health, it can be easy to conduct it in places where the entire population live, play, work and learn, this is the most creative, simple, clear and cost-effective way to improve hygienic interventions which later leads to good living. (Developing dentistry 2014).Traditionally oral care had low priority in the health care system in most countries (community dentistry 2nd edition) this is because most of the resources were being directed towards World control of Communicable Diseases. Some traditions had cultural practice such as filing of upper anterior teeth which they considered as beauty, and others extracted their lower anterior teeth, as well as extraction of Natal teeth. (Community Dentistry).Within the last few decades changes have occurred in oral health. Developing countries have shown a gradual increase in the preference of the two commonly occurring dental diseases (WHO 2012).

According to (WHO 2012), hygienic interventions workforce is too small to cope up with need of hygienic interventions care services and people demand for treatment (Community dentistry 2nd edition) Young children should be taught the importance of hygienic interventions practices such as cleaning their mouth with fluoridated paste and a good toothbrush, proper use of dental floss and the proper technique of brushing, A considerable portion of children have poor oral health because they don't clean their teeth, this is caused by limited awareness of importance of oral hygiene, while others have no access to tools used in promotion of oral hygiene. Hygienic interventions can also be maintained by the use of cleaning aids such as "Miswaki” (Traditional Chewing sticks) Sheiham, A., & James, W. P. T. (2014).

Somalia is a nation, located in the Horn of Africa, which has undergone prolonged periods of conflict since the fall of Said Barre in 2009 to 2012 when the first transitional government will be formed (Qayad, 2007). The 21 years of civil conflict destroyed the country's healthcare system through the loss of human resources and demolishment of the physical infrastructure. Although Somalia has undergone a semblance of relative peace, it continues to face significant security challenges from Al Shabab militia, a group associated with Al Qaeda. The radical militia group holds control over the rural areas, but it is expected that continuous support from its neighbors will help Somalia end the activities of the radical group.

Puntland has established social service policies within the government ministries and put in place the basic elements of a health care delivery system. It has benefited from some donor support, but requires more resources, materials, and help in capacity building to sustain the initiative. Puntland has made rapid improvements in water and sanitation service coverage but has requested extra capacity to drill and maintain boreholes and to train personnel. Relative stability and existing government structures in the northern areas have also given humanitarian agencies and donors the opportunity to examine and develop social service policies, which may be applicable in the less accessible areas of South and Central Somalia.

Considering the fact that in some communities, the school may be the only place where children can carry out hygienic interventions practice. By the help of their teachers and school health programs, it is therefore important that sufficient safe water and sanitation facilities are provided in schools. (WHO, 2003).Hygienic intervention can be effectively achieved through community involvement; there is little need for higher technology and expensive services to prevent oral diseases. (Community dentistry 2nd edition).When hygienic interventions are talked about; people tend to think it is the absence of diseases, failing to consider the optimal functioning of the oral cavity and its tissue in the best manner for the wellbeing of the individual and the highest level of self-esteem. This is the reason why the researcher is interested in investigating into details the impact of water, sanitation and hygienic interventions on improving health outcomes among school going children in Puntland Somalia.

## 1.2 Problem Statement

Lack of water, sanitation, and hygienic interventions causes poor hygienic interventions is the act of cleaning structuring and maintaining good standards of cleanliness to all structure of the oral cavity, may it be soft or hard tissue to prevent disease manifestation in the mouth. Hygienic interventions are important for the factions of Mastication, esthetic beauty, and speech Kwan, et al, (2005). Children with poor hygienic interventions can have a detrimental effect on their academic performance in school. Their co-curriculum activities can also be affected, which can later affect their success in life. Children who suffer from poor hygienic interventions are many times more likely to have restricted activities compared to children who are with good hygienic interventions and maintain the same; some of those disadvantages included missing to school to seek for oral treatment such as extraction or carious painful teeth and treatment of other periodontal diseases (Developing dentistry 2014).

The biggest problem is considering the fact that in some communities, the school may be the only place where children can carry out hygienic interventions practice. By the help of their teachers and school health programs, it is therefore important that sufficient safe water and sanitation facilities are provided in schools. (WHO 2003).Hygienic interventions can be effectively achieved through community involvement; there is little need for higher technology and expensive services to prevent oral diseases. When hygienic interventions are talked about; people tend to think it is the absence of diseases, failing to consider the optimal functioning of the oral cavity and its tissue in the best manner for the wellbeing of the individual and the highest level of self-esteem. This is the reason why this study is interested in investigating into details the impact of water, sanitation and hygienic interventions on improving health outcomes among school going children in Puntland-Somalia.

## 1.3 Main Objective

To assess the impact of water, sanitation and hygienic interventions on improving health outcomes among school going, children

## 1.3.1 Specific Objectives

**OB1:** To asses tooth brushing practice among school going children age 7 to 14 in Puntland-Somalia

**OB2:** To assess hygienic interventions seeking behavior among children attending primary schools between ages 7 to 14 years in Puntland-Somalia

**OB3****:** To determine the importance of hygienic interventions among the children between ages 7 to 14 years in Puntland-Somalia

## 1.4 Research Questions

**Ho1:** How to asses tooth brushing practice among school going children age 7 to 14 in Puntland-Somalia?

**Ho2:** What hygienic interventions seeking behavior among children attending primary schools between ages 7 to 14 years in Puntland-Somalia?

**Ho3:** How to determine the importance of hygienic interventions among the children between ages 7 to 14 years in Puntland-Somalia?

## 1.5Justification of the Study

**Children suffering from poor hygienic interventions**

Children who suffer from poor hygienic interventions are many times more likely to have restricted activities compared to children who are with good hygienic interventions and maintain the same; some of those disadvantages included missing to school to seek for oral treatment such as extraction or carious painful teeth and treatment of other periodontal diseases.

**Individuals with poor oral hygiene**

Oral diseases hinder proper feeding of an individual, who later contributes to the deterioration of the health of an individual and total esteem, hence this research is important to help the researcher to determine the level of hygienic interventions awareness and practice among school going children in relation to their health.

## 1.6 Significance of the Study

Poor hygienic interventions are the cause of several oral diseases, due to poor oral hygiene, dental caries, periodontal diseases, and other degenerative conditions develop, which lead to the contribution of affection of the general body health. Oral diseases hinder proper feeding of an individual, which later contributes to the deterioration of the health of an individual and total esteem, hence this research is important to help the researcher to determine the level of hygienic interventions awareness and practice among school going children in relation to their health.

## 1.7 Scope of the Study

The researcher conducted the study to determine and evaluate the level of hygienic interventions awareness and practice among school-going children, between 7 to 14 years in Puntland-Somalia, the study population covered all children within the age bracket of 7 to 14 years. Five schools were selected to take part in the study that is around the Puntland region in Somalia starting with BeletHawa Primary School, Khalid Primary School, Gawido Primary School, Waberi and Horsed Primary School.

## 1.8 Limitations

Some of the limitations that may affect the conduction of this study will be:-

1. The study was limited within Puntland-Somalia, whereby the study population were school going children between age7 to 14 yrs that finding their time was a bit difficult. The researcher overcame this by utilizing the break time children got for relaxing their brains.
2. Some of the selected interviewees had communication problem due to the fact that most of the people around this place speak Somalia language and understanding English was a big problem. The researcher overcame this by use of a translator from English language to Somali language for easier understanding.
3. Some schools authority only allowed the survey to be conducted during break time not to interfere with normal learning; this may lead to the problem since some children wanted to play. The researcher overcame by making sure the respondents that were within reach gave appropriate and detailed information.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Overview

This section will provide a comprehensive review of the existing empirical literature on the impact of water, sanitation and hygienic interventions on improving health outcomes among School-going Children in Puntland-Somalia. The theoretical framework provides the basic foundation of the study; it provided critical guidelines for the whole research particularly in the impact of water, sanitation and hygienic interventions of study variables described in the conceptual framework.

## 2.2 Empirical Literature

The empirical literature can be discussed according to the research objectives:OB1: To asses tooth brushing practice among school going children age 7 to 14 in Puntland-Somalia.OB2: To assess hygienic interventions seeking behavior among children attending primary schools between ages 7 to 14 years in Puntland-Somalia.OB3: To determine the importance of hygienic interventions among the children between ages 7 to 14 years in Puntland-Somalia

## 2.2.1 OB1: Assessing tooth brushing practice among school going children age 7 to 14

The researcher is interested in researching more on the impact of water, sanitation and hygienic interventions on improving health outcomes among school going children with developing a deeper interest in researching on general hygiene intervention of the children like brushing of teeth. A dental health survey on hygienic interventions habits among children in the United Kingdom in 2003 demonstrated a high level of awareness of hygienic interventions among all age groups of children. Between half and two-thirds of all children reported using electric toothbrushes, and the use of mouthwash and sugar-free gum was reported by over 40% of 15-year-olds. The study found that about three-quarters of children across all age groups were reported to brush their teeth twice daily. A range of hygienic interventions products was reported as being used in addition to toothbrushes and toothpaste. There was a trend in parental preferences towards the restoration of teeth rather than extractions and towards a better understanding of dental caries prevention (DA White, 2013).

The 2003 Children's Dental Health Survey concluded that Dental practitioners have a role to play in reinforcing these positive attitudes and encouraging appropriate and effective hygienic interventions behaviors in their child patients. The study concluded that there appears to be an increasing awareness of hygienic interventions among parents of all age groups of children, which was demonstrated by the reported tooth brushing behaviors and also the use of a range of hygienic interventions products and is a very positive development. The study found that variation in behavior related to social class may be a concern. (DA White 2013).

In rural India, the situation is different from the United Kingdom. Research on the level of hygienic interventions awareness among school children was conducted in Mangalore. The aim of the survey was to assess the awareness regarding hygienic interventions practice amongst children toward hygienic interventions in a rural population of Mangalore city. The survey found that 52% of children brush their teeth twice a day and 98.9% children brushed in a horizontal direction. Other hygienic interventions aids were sparsely used (5.3%). None of the school children had any form of interactive sessions on hygienic interventions practice with their respective class teacher in search of hygienic interventions advice. None of the pupils were found to have had used dental floss (Ananth, 2013).

Results of the study suggested that basic hygienic interventions knowledge and practice of the study participants was good but advanced knowledge needed to be improved.

In Nigeria, the awareness, attitudes and hygienic interventions practices of 5 and 12 years old Naval School children in the southern part of Nigeria were assessed in the year 2000 as part of a general survey. The objective was to assess the awareness, attitude, hygienic interventions practices and determine hygienic interventions level of the 5 and 12-year-old Nigeria Naval School children. The study found that 50% knew that sweet foods (mainly dietary sugars refined carbohydrates e.g. Milk and milk containing products, non milk sugars, soft drinks, fruit juices, and confectionary) would cause tooth decay. The study found 67% of the children obtained their source of information on regards of hygienic interventions care from their parents and guardians, majority of children, 81.7% used toothbrush and toothpaste for cleaning their teeth, none of the children were found to have used some dentifrices such as dental floss or inter-dental brushes. A higher proportion of 12 years old children (55.1%) than the 5year olds (48.8%) had more awareness about oral hygiene.

## 2.2.2 OB2: Determining the importance of hygienic interventions among the children between ages 7 to 14 years in Puntland-Somalia

In Malaysia, a study of hygienic interventions awareness and hygienic interventions practices among children aged 6-7 years were carried out in three urban schools in 2013. However, the study found that many of the children brushed less than twice per day. According to Locker, et al, (2011), only 40.1% of the children had visited a dentist and that was mainly because of toothaches or extractions. Majority of the children were found to have been using toothbrush and toothpaste, other forms of dentifrices were not much known, with none of the children had used dental floss. The study, which focused on three urban schools in Malaysia, revealed that that generally, the socioeconomic status of pupils affected the level of awareness and health seeking practices among pupils Durlak, et al, (2011).

The survey recorded that few children (3.1%) used the traditional hygienic interventions methods to maintain their oral hygiene, the lever of hygienic interventions from the survey was found unsatisfying, and hence hygienic interventions providers and workforce needed more improvement to cater for the need of hygienic interventions of the children. The study concluded that hygienic interventions awareness had not changed dramatically between 1985 and the year 2000. The study found that of the 162 respondents, 97.5% cleaned their teeth and they all used a conventional toothbrush. Only 22.2% brushed to prevent cavities. 73.8% of the children who had visited a dentist were scared on their first visit. 96.9% of the children knew that sugary foods and drinks are not good for the teeth. 85.2% knew that brushing prevents caries and 88.3% said that it is good to visit a dentist regularly.

The study recorded widespread poor hygienic interventions and poor hygienic interventions practices and low health seeking behavior among rural communities which implies there was a high demand for hygienic interventions care. Utilization of hygienic interventions cares facilities was mainly for symptomatic relief Lagarde, et al, (2007). Most people visited the dentist to have a tooth extracted and rarely for preventive care. The study found that (81.2%) of the children used toothbrush and toothpaste, majority of the children brushed once daily, 90% of the children never used dental floss neither had they used inter-dental brushes. The brushing techniques were found to be poor, as majorities were found to be brushing in the horizontal direction, the hygienic interventions awareness was not satisfying hence school hygienic interventions program and more hygienic interventions providers were recommended to be employed O'boyle, et al, (2001).

# The study concluded that there was a need to promote public awareness of oral health, in particular, preventive hygienic interventions measures with the aim of reducing the high levels of poor hygienic interventions status. Hygienic interventions stakeholders through the mass media, bazaars and door-to-door can implement this promotion. There is a need for hygienic interventions care policymakers to strengthen collaboration between private and public hygienic interventions care providers to ensure hygienic interventions care services are accessible, affordable, and provide appropriate services (Mwacharo 2011)2.2.3 OB3: Determine the importance of hygienic interventions among the children between ages 7 to 14 years in Puntland-Somalia

It is estimated that 10 billion tons of solid waste are generated each year in the USA with mining activities contributing approximately 2 billion tons. However, what is more, problematic is commercial and residential waste that consists of plastics, food wastes, yard waste, and discarded appliances. These are categorized as solid waste and are mainly managed using two methods, disposal in sanitary landfills or through incineration. Therefore lack of infrastructure like poor roads will make waste disposal impossible as transportation of waste to various landfills and running water sources will be inaccessible Verma, et al, (2019).

Depending on the degree of recovery and the type of materials in the solid waste, it has a 95% to 96% chance of reducing the mass of the solid waste. First, materials have to be separated into two say organic waste and inorganic waste. Organic waste can be disposed of using methods such as composting while the inorganic materials are incinerated. Incineration makes use of high temperatures to convert the waste materials into gas, heat, and particles Haug, R. (2018). The gases and particles are usually treated before being released into the atmosphere. Moreover, incineration can be used to dispose of used medical equipment or hazardous industrial waste through heat treatment. Heat treatment ensures that the toxins contained in the waste are destroyed to avoid any danger of contact with people Padmanabhan, et al, (2019).

Opponents of waste incineration, however, argue that waste incineration produces harmful particles, such as carbon monoxide and carbon dioxide, which can affect the atmospheric environment. Waste burning produces smoke that contains several dioxides and furans that are a significant contributor to the depletion of the ozone layer and hence global warming. Although there are new technologies that ensure that the gases are treated before being released into the atmosphere, studies have shown that these gases are still not environmentally sustainable. According to research in the journal Environmental Science and Technology, burning waste emits pollution and toxic particles into the air (weather.com, 2014).

These also contribute to increases the chance of global warming that requires proper intervention due to the fact that waste disposal can be done in a better way to avoid all these, hence making the technology unsafe for the environment. Furthermore, incineration facilities rely on heavy metals such as lead in their processes which are also harmful to human health when released. The dioxide and furan contents also have adverse effects on human health causing illnesses such as lung cancer when inhaled (Kimberlee, 2017).

As part of the promotion of hygienic interventions and general body health, it can be easy to conduct it in places where the entire population live, play, work and learn, this is the most creative, simple, clear and cost-effective way to improve hygienic interventions which later leads to good living. (Developing dentistry 2014).Traditionally oral care had low priority in the health care system in most countries (community dentistry 2nd edition) this is because most of the resources were being directed towards World control of Communicable Diseases. Some traditions had cultural practice such as filing of upper anterior teeth which they considered as beauty, and others extracted their lower anterior teeth, as well as extraction of Natal teeth. Within the last few decades changes have occurred in oral health. Developing countries have shown a gradual increase in the preference of the two commonly occurring dental diseases (WHO 2012).

According to (WHO 2012), hygienic interventions workforce is too small to cope up with need of hygienic interventions care services and people demand for treatment (Community dentistry 2nd edition) Young children should be taught the importance of hygienic interventions practices such as cleaning their mouth with fluoridated paste and a good toothbrush, proper use of dental floss and the proper technique of brushing, A considerable portion of children have poor oral health because they don't clean their teeth, this is caused by limited awareness of importance of oral hygiene, while others have no access to tools used in promotion of oral hygiene. Hygienic interventions can also be maintained by the use of cleaning aids such as "Miswaki" (Traditional Chewing sticks) Sheiham, A., & James, W. P. T. (2014).

Hygienic interventions can be effectively achieved through community involvement; there is little need for higher technology and expensive services to prevent oral diseases. When hygienic interventions are talked about; people tend to think it is the absence of diseases, failing to consider the optimal functioning of the oral cavity and its tissue in the best manner for the wellbeing of the individual and the highest level of self-esteem Gil-Montoya, et al, (2015).

## 2.3 Conceptual Framework

The following conceptual has both *independent variables* which in this study stands for research objectives:OB1: To asses tooth brushing practice among school going children age 7 to 14 in Puntland-Somalia.OB2: To assess hygienic interventions seeking behavior among children attending primary schools between ages 7 to 14 years in Puntland-Somalia.OB3: To determine the importance of hygienic interventions among the children between ages 7 to 14 years in Puntland-Somalia.*Moderating variable* involves Somalia government intervention on policy implementation and lastly *dependent variable* that involves improving health outcomes among school going children in Puntland-Somalia.

**Independent variables Dependent variable**

**Tooth brushing practice among school going, children**

* Maintaining oral hygiene
* Reducing levels of a poor hygiene intervention

**Interventions on improving health outcomes**

* Better health
* Better strategies

**Hygienic interventions seeking behavior**

* General body health
* Utilization of hygienic interventions

**Importance of hygienic interventions**

* Improved health-care
* Reduced economic cost

**Intervening Variable**

**Government Variable**

* Policy implementation and formulation

**Figure 1:** Conceptual Framework

**Source:** Researcher 2019

## 2.4 Research Gap

The most concerning issue is thinking about the way that in certain networks, a school might be the main spot where youngsters can complete sterile intercessions practice. By the assistance of their educators and school wellbeing programs, it is in this way significant that adequate safe water and sanitation offices are given in schools. (WHO 2003).Hygienic intercessions can be viably accomplished through network association; there is little requirement for higher innovation and costly administrations to anticipate oral maladies.

At the point when sterile medications are discussed; individuals will, in general, think it is the nonattendance of infections, neglecting to think about the ideal working of the oval hole and its tissue in the best way for the prosperity of the individual and the most elevated amount of confidence. This is the motivation behind why the analyst is keen on exploring into subtleties the effect of water, sanitation and cleans mediations on improving wellbeing results among school going kids in Puntland Somalia.

# CHAPTER THREE: STUDY METHODOLOGY

## 3.1 Overview

This chapter outlines the research methodology used in conducting this research. This includes the study site, study design, population, sampling techniques and sample size, research instruments, data collection procedures, and data analysis procedures.

## 3.2 Research Design

The study used a cross-sectional research design with both qualitative and quantitative research design. The quantitative research design measures the degree of association between the dependent variables and the dependent variable while the descriptive research design was used to describe the phenomenon as it is by answering the questions what, how, and where (Lambert & Lambert, 2012). The qualitative aspect of the study was instrumental in the collection of in-depth information regarding the study questions and the detailed account of information that was used in answering the research objectives and essential in the formulation of recommendations.

## 3.3 Study population

The study population involved primary school pupils aged 7 to 14 years in Puntland-Somalia.

## 3.4 Sampling and Sample Size (Sampling)

The simple random sampling method was used to get names of the schools which took part in the study (study population) a list of all primary schools to be used in the study was driven from Puntland region. Each school name was written on a separate piece of paper, then folded and put in a dry bucket, after which they were shaken vigorously to ensure randomization. The researcher then picked some papers from box, the names that appeared on the paper were the ones used in the entire study to avoid bias which in this case five primary school names selected by the researcher involves:BeletHawa Primary School, Khalid Primary School, Gawido Primary School, Waberi and Horsed Primary School

The desired sample size will be calculated using the formula below

N = Z2pq

d

Desired sampled size

The standard normal deviation at the required confidence level.

The proportion in the target population estimated to have the characters being measured

In this case, the confidence level was 96%, therefore, z was 1.96

No estimate was available from the value of P hence 50% will be used as recommended by Fisher et al. the value of q was 0.5 since it was arrived at, by subtracting P from 1, the value of d was 0.05since the confidence level was 96%

The level of statistical significance set.

N= (1.96)2 (0.5) (0.5)

0.05

3.8416(0.25)

0.0025

3.8416(0.25 = 384.16

0.0025

## 3. 7 Data Collection

The data was collected by the use of a questionnaire, which was personally administered by the researcher. The questionnaires contained questions delivered from hygienic interventions awareness and practice. The researcher read the questions to the interviewees, and completes the questionnaires following the response from the interviewees. The data collected with the questionnaires was later extracted and analyzed.

## 3.8 Validity and Reliability of Research instruments

## 3.8.1 Validity of the Questionnaire

This study used content validity. Content validity is a measure of the degree to which data is collected using a particular concept (Kothari, 2004). Consultations and discussions with supervisors and experts in the School of medicine and health sciences at *Africa Institute for Project Management Studies (AIPMS)* were done to establish content validity. Face validity was undertaken to check for clarity and ambiguity of the questions.

## 3.8.2 Reliability of Research Instruments

Kothari (2004) states that an instrument is said to be reliable if it yields consistent results over a period of time. The split-half method was used to establish reliability determine consistency of the questionnaires to be administered. To test for internal consistency group of items, the questionnaire was tested using Cronbach coefficient alpha for the extent they measure or explain the variable. A cut-off of 0.6 was acceptable in assessing reliability for multi-item scales. According to Best & Kahn (2005), a reliability coefficient of 0.7 and above is sufficient for an instrument. Hence if the coefficient obtained lied in this range, the researcher considered the instrument to be reliable. This test applied to the close-ended questionnaire items. If the coefficient obtained was lower, the researcher revised the instruments before using them for data collections.

## 3.10 Data Analysis

Kombo and Tromp (2006) describe the analysis of data as the process of scrutinizing what has gathered and making conclusions and inferences out of it. The researcher coded data after modeling into a form that tallied with the objectives of the study. These included straight forward means; standard deviations, recurrence tables, relationships and relapse investigation with the guide of SPSS (version 23). Factor examination was connected for data diminishment and keeping an eye on the regression and correlation analysis. While qualitative data was analyzed with the help of SPSS software.

## 3.11 Inclusion and Exclusion Criteria

All the selected children who participated were within the age limit in between 7 and 14 years, children names were excluded to ensure confidentiality

# CHAPTER FOUR: INTERPRETATION OF RESULTS

## 4.1 Demographic Characteristics

Demographic information of the study respondents was collected being on gender because the study respondents were of known ages that is 7-14 year old children meaning that the age had already been determined and known already.

## 4.2 Response rate

A total of 384 were examined in the study, this represented 100% of the whole population in the study and luckily enough all the questionnaires were returned giving a total percentage of 100%. This proved the fact that the sample sizes as shown below were all included in the study.

The desired sample size will be calculated using the formula below

N = Z2pq

d

Desired sampled size

The standard normal deviation at the required confidence level.

The proportion in the target population estimated to have the characters being measured

In this case, the confidence level was 96%, therefore, z was 1.96

No estimate was available from the value of P hence 50% will be used as recommended by Fisher et al. the value of q was 0.5 since it was arrived at, by subtracting P from 1, the value of d was 0.05since the confidence level was 96%

The level of statistical significance set.

N= (1.96)2 (0.5) (0.5)

0.05

3.8416(0.25)

0.0025

3.8416(0.25 = 384.16

0.0025

## 4.3:Ho1: Assessing tooth brushing practice among school going children age 7 to 14

## Table 4.1 Distributions of Respondents on Whether They Brushed Their Teeth

|  |  |  |
| --- | --- | --- |
| Brushing Teeth | Frequency | Percentage |
| Yes | 101 | 26.30% |
| No | 283 | 73.70% |

The study respondents gave out a 73.70% representing those that do not brush their teeth totally or do it often while 26.30% confirmed brushing their teeth regularly. One of the respondents said that *“……sometimes access to clean water is a problem and the only available water may be dirty or salty therefore I opt to avoid brushing my teeth in the morning”* .According to (WHO 2012), hygienic interventions workforce is too small to cope up with need of hygienic interventions care services and people demand for treatment (Community dentistry 2nd edition) Young children should be taught the importance of hygienic interventions practices such as cleaning their mouth with fluoridated paste and a good toothbrush, proper use of dental floss and the proper technique of brushing, A considerable portion of children have poor oral health because they don't clean their teeth, this is caused by limited awareness of importance of oral hygiene, while others have no access to tools used in promotion of oral hygiene. Hygienic interventions can also be maintained by the use of cleaning aids such as "Miswaki" (Traditional Chewing sticks) Sheiham, A., & James, W. P. T. (2014).

## Table 4.2 Distribution of respondent by what they use to brush their teeth

|  |  |  |
| --- | --- | --- |
| Practice | Total | Percentage |
| Tooth brush and tooth paste | 200 | 52% |
| Tooth brush and salt | 111 | 29% |
| Finger and salt | 65 | 17% |
| Finger | 8 | 2% |
| Total | 384 | 100% |

As shown in table 4.2 above 200 pupils (53%) used a tooth brush and toothpaste. A further 111 pupils (29%) used a tooth brush but with salt and not tooth paste. A few (17%) used finger and salts. Only 8 (2%) used fingers to clean their teeth. According to the literature review hygienic interventions can be effectively achieved through community involvement; there is little need for higher technology and expensive services to prevent oral diseases. When hygienic interventions are talked about; people tend to think it is the absence of diseases, failing to consider the optimal functioning of the oral cavity and its tissue in the best manner for the wellbeing of the individual and the highest level of self-esteem Gil-Montoya, et al, (2015).

## Figure 4.1: Distribution of respondent by what they use to brush their teeth

## Table 4.3 Distribution of respondents showing how frequent they brush their teeth

|  |  |  |
| --- | --- | --- |
| Frequency | Total | Percentage |
| Occasionally | 19 | 5 |
| Once daily | 240 | 63 |
| Twice daily | 121 | 30 |
| More than twice daily | 4 | 2 |
| Total | 384 | 100 |

Majority of the pupils, (63%) 240 brushed their teeth once a day. Only 30 % (121) pupils brushed their teeth twice daily, only 2% (4) brushed their teeth more than twice a day. Few children cleaned their teeth occasionally and this includes 5%.

This links to the literature review that talks about As part of the promotion of hygienic interventions and general body health, it can be easy to conduct it in places where the entire population live, play, work and learn, this is the most creative, simple, clear and cost-effective way to improve hygienic interventions which later leads to good living. (Developing dentistry 2014).Traditionally oral care had low priority in the health care system in most countries (community dentistry 2nd edition) this is because most of the resources were being directed towards World control of Communicable Diseases. Some traditions had cultural practice such as filing of upper anterior teeth which they considered as beauty, and others extracted their lower anterior teeth, as well as extraction of Natal teeth. Within the last few decades changes have occurred in oral health. Developing countries have shown a gradual increase in the preference of the two commonly occurring dental diseases (WHO 2012).

## Figure 4.2 Distribution of respondents showing the technique use to brush their teeth

Almost all pupils (97%) 372 of the pupils brushed their teeth using the horizontal technique. 2% (8) used the vertical method. Only 1% (4) used the combined method. None of the pupils used circular motion to brush their teeth.

## Table 4.4 Distribution of respondents showing the type of brush they used

|  |  |  |
| --- | --- | --- |
| Type of tooth brush | frequency | Percentage |
| Soft | 30 | 8% |
| Medium | 346 | 90% |
| Hard | 8 | 2% |

A few number of the children 8% (30) used soft brushes to clean their teeth, 90% (346) of the children used medium tooth brush, a total of 8 children, 2% used hard brushes.

## 44:Ho2: What hygienic interventions seeking behavior among children

## Table 4.5 Distribution of respondents on whether they change their tooth brush

|  |  |  |
| --- | --- | --- |
| Changing Tooth Brush | Frequency | Percentage |
| Yes | 101 | 26.30% |
| No | 283 | 73.67% |

All pupils in Puntland changed their tooth brush; this was 100% representing a total of 384 pupils, which is the whole sample size.

## Table 4.6: Distribution of Response Showing How Frequent They Change Their Tooth Brush

|  |  |  |
| --- | --- | --- |
| When brush are changed | Frequency | Percentage |
| When useless | 300 | 78% |
| After every 3 months | 0 | 0% |
| After every 6 months and beyond | 84 | 12% |

## Majority of children in Puntland changed their brush when it became useless this was a total of 300 children 78%, none of the children changed their brush after every six months, 12% (84) of the children used to change their teeth after every six month.

## Table 4.7: Distribution of Respondents on Whether They Used These Interdental Aids

|  |  |  |
| --- | --- | --- |
| Interdental Aids | Frequency | Percentage |
| Dental Floss | 0 | 0% |
| Wooden Toothpicks | 54 | 14% |
| Interdental Brush | 0 | 0% |
| Never used or know | 330 | 86% |

Out of the 384 pupils, only (14%) 54 used wooden tooth picks, none of the pupils had used dental floss neither inter-dental brush, majority of them 86% (330) had never used or knew what inter-dental aids are.

## Fig. 4.3 Distribution of Respondents on the Type of Dentrifices they used

Majority of the pupils were aware of and used tooth brushed and tooth paste (280)73% Very few pupils 7% (27) had used dental mouth wash. A few pupils (20%) 77 of these had used other unconventional types of dentifrices.None of the respondents had used or even seen dental floss.

## Table 4.8 Distribution of Respondents on whether they clean their tongue

|  |  |  |
| --- | --- | --- |
| Tongue cleaning | Frequency | Percentage |
| Yes | 279 | 73% |
| No | 105 | 27% |

Majority of the respondents 73% (279) cleaned their tongue, a few respondents 27% (105) of the respondents said they never cleaned their tongue.

## Table 4.9 Distribution of Respondents Showing Whether They Rinse Their Mouth after Eating

|  |  |  |
| --- | --- | --- |
| Rinse Mouth Wash | Frequency | Percentage |
| Yes | 235 | 61% |
| No | 149 | 39 |

Out of 384 respondents, 61% (235) claimed to rinse their mouth after every meal, 39% (149) of the pupils did not rinse their mouth after eating.

## Table 4.10 Distribution of respondents showing whether they visit a dentist

|  |  |  |
| --- | --- | --- |
| Visit a dentist | Frequency | Percentage |
| Yes | 68 | 17% |
| No | 316 | 83% |

Majority of pupils 83% (316) never visited a dentist, only a few pupils 17% (68) visited dentist, and it was mainly when they had problem.

## 4.5:Ho3: The importance of hygienic interventions among the children

## Table 4.11 Distribution of Respondents Showing the Last Time They Visited a Dentist

|  |  |  |
| --- | --- | --- |
| Last Visit To Dentist | Frequency | Percentage |
| Last Six Moths | 0 | 0% |
| Last 2 Years Ago | 30 | 7% |
| Last 5 Years Ago | 38 | 10% |
| I Have Never Visited | 316 | 83% |

From the study, none of the pupils visited the dentist as required, pupils who claimed to visit a dentist, 7% (30) of the pupils visited dentist the last two years ago, 10% (38) pupils visited dentist last five years ago, while majority of pupils 83% (316) had never visited a dentist.

## Table 4.12 Distribution of Respondents on Why They Visited a Dentist

|  |  |  |
| --- | --- | --- |
| Resion For Visiting Dentist | Frequency | Percentage |
| Only when in pain | 68 | 17% |
| To have teeth checked | 0 | 0% |
| Have advice about the teeth | 0 | 0% |
| I don’t know | 316 | 83% |

Few pupils 17% (68) of those who claimed to have visited a dentist, they did it only when they had pain, none of the pupils who attend schools in Puntland have ever visited a dentist for a checkup, or searching for any advice, majority of pupils, 83% (316) have never visited a dentist, they even don’t know the importance of visiting dentist.

## Table 4.13 Showing distribution of respondents on whether they noticed bad berths in their mouth

|  |  |  |
| --- | --- | --- |
| Noticed bad breath | frequency | Percentage |
| Yes | 109 | 31% |
| No | 275 | 69% |

Table 4.13 above shows that 31% (109) of the pupils had noticed bad berths at a point in their lives.While 69% of the pupils had never noticed breath in their mouths.

## Table 4.14 Distribution of respondents showing whether they noticed bleeding gums in their life

|  |  |  |
| --- | --- | --- |
| Noticed Bleeding Gums | Frequency | Percentage |
| Yes | 78 | 20% |
| No | 306 | 8O% |

Few pupils 20% (78) had ever noticed bleeding gum in their life, majority of pupils 80% (306) had never noticed bleeding gum in their life. Considering the fact that in some communities, the school may be the only place where children can carry out hygienic interventions practice. By the help of their teachers and school health programs, it is therefore important that sufficient safe water and sanitation facilities are provided in schools. (WHO, 2003).Hygienic intervention can be effectively achieved through community involvement; there is little need for higher technology and expensive services to prevent oral diseases. (Community dentistry 2nd edition).When hygienic interventions are talked about; people tend to think it is the absence of diseases, failing to consider the optimal functioning of the oral cavity and its tissue in the best manner for the wellbeing of the individual and the highest level of self-esteem.

# CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMEDITIONS

## 5.1 Discussion

Out 0f 384 pupils in the research, they all claimed to have been brushing their teeth, this represents 100%, this is mainly attributed by the fact that majority of pupils cleaned their teeth as preparation to go to school. None of the pupils claimed to have not been brushing their teeth.

Majority of the respondent used tooth brush and tooth paste to brush their teeth, however a certain portion of pupils (29%) used tooth brush and salt to brush their teeth, very little percentage used finger and salt, this may be attributed by the fact that tooth brushes and tooth pastes are readily available in the local market and shops in the area.

Majority of the pupils (63%) brushed their teeth once a day, whereas (30%) pupils brushed their teeth twice a day, this may be attributed to their daily grooming habits, most of pupils cleaned their teeth as part of preparation to go to school in the morning, similarly to the study carried out in Malaysia few percentage of the pupils (5%) brushed their teeth occasionally, this may be due to lack of adequate teeth cleaning aids or lack of awareness of the importance of maintaining oral hygiene. In contrast to the study carried out in America very little percentage (2%) brushed their teeth more than twice a day.

Majority of the pupils brushed their teeth using the wrong technique( horizontal technique) this is mainly caused by lack oral hygiene programmes in schools where children can be taught about the right way of brushing, the correct technique of brushing ( horizontal with small circular rotations) helps in providing cleanness to the whole parts of teeth including inter-dental areas, grooves and fissures , correct brushing technique does not cause gum injury as well as gum recession which causes teeth sensitivity when the roots get exposed

The study found that majority of the children used medium type of brush to clean their teeth, this is mainly due to the type of brushes available in the local market, 30% used soft bristles brush while 2% used hard brush, this may be due to limited knowledge about the harm hard brushes can cause to their gums, causing oral health problems such as injury to the gum.

The study found that none of the pupils changed their brush after every three months as recommended by dentists, this may cause build up of dental problems to the children since worn out brushes may fail to get to the inter-dental areas and get laid of food remains, short brush bristles may fail to reach to the grooves and fishers mainly in molar teeth, hence causing dental caries, and other conditions such as halitosis.

The survey found that none of the respondents had ever used dental floss, this could be attributed to the fact that dental floss is expensive, and also not available in the local market. Lack of oral health education in schools can also explain this. This finding is similar to the study conducted in Mangalore India, among rural children, where the use of dental floss was found to be (2%) very minimal.

In contrast, a similar study in UK found that a high percentage (42%) of the pupils studied used dental floss. The reason for this may be because the UK government has significant resources allocated to health education programs. However it was found out that tooth brush and tooth paste was the most commonly used type of denitrifies, while low percentage of pupils had used mouth wash, this is similar to the studies conducted in other parts of Kenya, a small percentage of children claimed to have used other unconventional types of teeth cleaning aids (Miswaki and Silt, 2018), this may have been contributed by factors such as traditional and religious believes. Some traditions believe that some trees have medicinal value while some religions don’t allow the use of medicine.

A higher percentage of the respondents were found to be cleaning their tongue and rinsing their mouth after eating, this may be attributed to the fact that majority of pupils drink water after eating, hence they rinse their mouth as a routine, lack of awareness about the importance of visiting a dentist is high, majority of children have never visited a dentist, either to seek for treatment or advice, the little percentage who claimed to have had visited a dentist was mainly when they had a problem, and mainly was tooth ache which they went for extraction, this study findings is similar to the study that was conducted in Nigeria and Punland whereby higher percentage visited a dentist when they had a problem ( Mwacharo,2018)

From the study it was found that (20%) of the respondents had noticed bleeding gum once in their live time, (80%) of the respondents had never noticed bleeding gums, this may be well explained by the fact that children of Punland were found to have little knowledge about the manifestation of oral disease, high percentage was found to have noticed bad berths on their life.

## 5.2 Conclusion

1. The survey concluded that the level of oral hygiene awareness and practice is poor,
2. Majority of children in Punland use wrong technique to brush their teeth.
3. Majority of children have limited awareness on various types of dentifrices

## 5.3 Recommendations

1. School children should be given oral health education through the curriculum and awareness campaigns.
2. Oral health promotion programs for parent, children should be organized, oral health providers should work with school authorities to organize for such campaigns.

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# APPENDICES

# APPENDIX I

**Questionnaire Impact of Water, Sanitation and Hygienic Interventions on Improving Health Outcomes among School Going Children in Puntland-Somalia.**

AGE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SEX\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SCHOOL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Do you clean your teeth?
2. Yes (b) No
3. If yes what do you use to clean your teeth?
4. Charcoal
5. Toothbrush & toothpaste
6. Toothbrush and salt
7. Finger and salt
8. Piece of wood
9. How often do you clean your teeth?
10. Occasionally
11. Once daily
12. Twice daily
13. More than twice daily
14. Which technique do you use for brushing?
15. Horizontal
16. Circular
17. Vertical
18. Combined
19. What type of brush do you use for brushing?
20. Hard
21. Medium
22. Soft
23. Never noticed
24. Do you change your toothbrush?
25. Yes b) No
26. If yes how often do you change your brush?
27. when useless
28. once in three months
29. every six months
30. once per year
31. do you use any of these inter-dental aids
32. Dental Floss
33. Wooded toothpick
34. Inter-dental brushes
35. Do you clean your tongue?
36. Yes b) No
37. Do you rinse your mouth after eating?
38. Yes b) No
39. Do you use mouth wash?
40. Yes b) No
41. Have you ever noticed a bad breath?
42. Yes b) No
43. Do you visit a dentist?
44. Yes b) No
45. When was the last time you visited a dentist?
46. Last 6 months
47. Last two years ago
48. Last five year ago
49. I have never visited a doctor
50. Why do you visit the dentist?
51. Only when in pain
52. To have my teeth checked
53. To have advice about my teeth
54. I don’t know

# APPENDIX II: WORK PLAN

|  |  |  |  |
| --- | --- | --- | --- |
|  | **May-June**  **2019** | **July**  **2019** | **August**  **2019** |
| Topic Identification |  |  |  |
| Proposal Writing |  |  |  |
| Proposal Presentation |  |  |  |
| Data Collection |  |  |  |
| Data Analysis & Preparation |  |  |  |
| Report Defense & Corrections |  |  |  |

# APPENDIX III: BUDGET

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item Description** | **Quantity Description** | **Quantity** | **Unit Price - KShs** | **Cost- KShs** |
| Stationery | pieces | 4 | 500 | 2,000 |
| Photocopying Services | pages | 50 | 5 | 2,500 |
| Spiral binding | pieces | 10 | 40 | 400 |
| Bookbinding | pieces | 10 | 200 | 2,000 |
| Travel Charges | person | 2 | 6,000 | 12,000 |
| Research Assistant for data collection | person | 2 | 10,000 | 10,000 |
| Research Assistant for data analysis | person | 2 | 30,000 | 10,000 |
| **Total** |  |  |  | **41,900** |