Cape Peninsula
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THE EFFECTIVENESS OF PRIMARY SCHOOL HEALTH AND HYGIENE INTERVENTIONS BY ENVIRONMENTAL HEALTH PRACTITIONERS IN THE WESTERN CAPE, SOUTH AFRICA

by

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I, Kelly Morkel, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

19 May 2025

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ABSTRACT

According to the World Health Organization poor sanitation, unsafe water, and insufficient hygiene is the underlying reason for outbreaks of diseases such as cholera, dysentery, hepatitis A and typhoid. Inversely, eradicating poverty; encouraging good health and well-being education; clean water and access to adequate sanitation prevent diseases and associated death. Yet, the implementation of improved water, sanitation and hygiene infrastructure could prevent the annual deaths of 395 000 children aged under five years. South Africa with a population of 61 million people and a poverty rate of 55%, has shown an overall increase from 61.7% to 83% of household having access to sanitation (South African Government, 2024). The Western Cape Province, which is the focus of this study, leads with a 93.8% accessibility followed by Mpumalanga at 68.1%. The focus of this study is to assess the effectiveness of environmental health practitioners' (EHPs) WASH interventions (infrastructure provision and awareness programmes) at schools in the Western Cape Province in South Africa. Children are particularly vulnerable to preventable deaths such as diarrhoeal diseases (Srivastava & Mishra, 2022) with some sub-Saharan Africa regions continuing to have the highest rates of mortality in children younger than 5 years (Gatimu & Kimani, 2022; Kehoe, et al., 2023). The Three Star Approach for Water and Sanitation Hygiene (WASH) in schools was used as an evaluation criterion, along with the Environmental Health Norms and Standards and Integrated School Health Policy (ISHP). A mixed methods case study research design were followed, employing semi-structured interviews, observations, questionnaires, photographic gestalt, and sanitation audits to obtain data from the Grade 7 students, teachers, groundsmen and environmental health practitioners (EHPs) to achieve the objectives of the study. Applying the various data collection techniques, the case study determined the ways in which 1) EHPs are informed to conduct a health and hygiene interventions at schools, 2) methods they use to conduct these interventions, 3) monitoring and evaluation methods and 4) the overall effectiveness of the interventions. The research revealed that none of the schools reached a one star. With data producing main themes – such as a lack of infrastructure in schools, limited legislative and policy knowledge of EHPs and a lack of strategy used by EHPs. The study recommends the establishment of inter-department relationships and re-education on the use of the current monitoring and evaluation tool. In conclusion, the study produced a baseline template to assist EHPs to conduct sanitation audits and environmental assessments.

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I wish to thank:

DEDICATION

I dedicate my thesis to all the children who lost their lives to diarrhoea and to the dedicated professionals tirelessly working to combat this disease, fostering resilience and empowering communities to reduce child mortality.

I also dedicate my thesis to all Environmental Health Practitioners (EHPs) whose invaluable efforts in preventative health often go unrecognised and to those EHPs who we sadly lost during the covid19 pandemic. Your commitment and sacrifices are deeply appreciated.

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ACRONYMS

CAPS	National Curriculum and Assessment Policy Statement
CoCT	City of Cape Town
COMBI	Communication for Behavioural Impact
COVID-19	Coronavirus disease
CSDH	Commission on Social Determinants of Health
DBE	Department of Basic Education
DoE	Department of Education
DoH	Department of Health
DSD	Department of Social Development
DWS	Department of Water and Sanitation
EH	Environmental health
EHP/s	Environmental health practitioner/s
EHS	Environmental health services
HPO	Health promotion officer
IDP	Integrated Development Plan
HPCSA	Health Professional Council of South Africa
IEC	Information, education and communication
ISHP	Integrated School Health Policy
NGO	Non-governmental organisation
NHA	National Health Act
PDR	Plan-Do-Review
PHC	Primary health care
RSA	Republic of South Africa
SDGs	Sustainable Development Goals
SLA	Service-level agreement
UN	United Nations
UNICEF	United Nations Children's Emergency Fund
WASH	Water, sanitation and hygiene
WHO	World Health Organization
WIL	Work Integrated Learning

GLOSSARY

Apartheid	A system of segregation or discrimination on grounds of race
Behaviour change	The practice of altering a person's behaviour, changing from knowing it is important to wash one's hands to actually washing one's hands
Case fatality rate	This is the proportion of those diagnosed with a disease who die from that particular disease
Determinants of health	Categories that influence the health status of an individual or community, such as behaviour, physical and social environment, health services
Diarrhoea	A disease that causes loose stool, vomiting, fever and dehydration
Effectiveness	Obtaining the desired change due to knowledge transfer, and behaviour change through interventions
Efficacy	Producing a desired or intended result.
Efficiency	Producing quality service for the community, with the allocated resources
Environmental health	Monitoring and mitigation the spread of disease or any effect on human health based on environmental factors
Feeding schemes	Some schools in South African provide food for those children whose families cannot afford it. Each school has a list of children allocated to the feeding scheme, where they are given one meal each day
Groundsman	Another word for groundskeeper or caretaker of a school's premises
Health education	Educating the community on how to maintain personal health
Health inequality	Receiving a different quality of service or access to health service based on area, ethnicity, or socio-economic status
Health outputs/outcomes	Health outputs are the actual goods or services produced by programmes or organisations (e.g., a support group for people affected by chronic diseases). Health outcomes measure the impact or consequence of the output in the longer term (e.g., longer and healthier lives) (National Health Promotion Policy and Strategy 2015–2019)
Health promotion intervention	A health promotion intervention is an effort or activity aimed at promoting and enabling people to take control of their health and developing skills to practise healthy behaviours like physical activity and preventing unhealthy behaviours (e.g., smoking, illicit drug use or excessive alcohol use) (National Health Promotion Policy and Strategy 2015–2019)

Input indicators	These are indirect measures or signs that represent an outcome in the absence of a direct measure or indicator (National Health Promotion Policy and Strategy 2015–2019)
Integrated development plan	An overall framework for development, specifically for the district
Intervention(s)	This refers to health and hygiene intervention by environmental health practitioners/environmental health assistance at schools
Onset	The first set of data collection
PDR (Plan-Do-Review)	Provides the frequencies of work for the financial year that needs to be accomplished
Project portfolio	An EHP in the various areas within the City of Cape Town is responsible for the co-ordination of all health and hygiene interventions and resources in their area, all to achieve the predetermined PDR for the year
Quintile	The education system divides schools into five groups, with Quintile 1 being the poorest 20% and Quintile 5 being the least poor (affluent) 20%
Situation market analysis	An analysis to identify and understand the desired behaviour outcome directly from the perspective of the affected communities
Social gradient	This is the unfair and preventable difference in health status seen within and between countries and/or communities
South Africa's District Health Barometer	Provides an overview of the performance of public health services in South Africa
Sub-district	Refers to the geographical division of an area to organise city health resources
Sustainable Development Goals	The collection of 17 goals set by the United Nations, each goal having individual targets to achieve
Well-being	The absence of communicable diseases and an unhygienic environment

CHAPTER ONE: BACKGROUND OF STUDY

According to the World Health Organization (WHO) (2023a), poor sanitation, unsafe water, and insufficient hygiene is the underlying reason for outbreaks of diseases such as cholera, dysentery, hepatitis A and typhoid. Inversely, eradicating poverty; encouraging good health and well-being education; clean water and access to adequate sanitation prevent diseases and associated death (Wolf, et al., 2023).

Tackling different facets of environmental health namely provision of adequate water and sanitation and hygiene services; disease prevention and health promotion, is well established in practice (Anthonj, 2021; Chirgwin, et al., 2021; Tseole, Mindu, et al., 2022; Yamauchi, 2022). This interlacing of responsibilities has also been an important building block of several international, national and local authority health promotion programmes including the United Nation's (UN) 17 Sustainable Development Goals (SDGs); WASH Alliance International; and World Vision (Matthews Ofori-Kuma, 2018; Bennich, et al., 2020; United Nations Department of Economic and Social Affairs, 2020).

Children are particularly vulnerable to preventable deaths such as diarrhoeal diseases (Srivastava & Mishra, 2022) with some sub-Saharan Africa regions continuing to have the highest rates of mortality in children younger than 5 years (Gatimu & Kimani, 2022; Kehoe, et al., 2023). The WHO reports in March 2024 stated that in 2022, 57% of the global population (4.6 billion people) used a safely managed sanitation service. More than 1.5 billion people still do not have basic sanitation services, such as private toilets or latrines while of these, 419 million still defaecate in the open, in street gutters, behind bushes or into open water bodies (WHO, 2024).

Yet, the implementation of improved water, sanitation and hygiene (WASH) infrastructure could prevent the annual deaths of 395 000 children aged under five years (Mebrahtom, et al., 2022; WHO, 2023b). According to the American Centres for Disease Control and Prevention (CDC, 2024), specifically handwashing with soap protects one in three young children from diarrhoea and one out of five young children from pneumonia.

South Africa, with a population of 61 million people and a poverty rate of 55%, has shown an overall increase from 61.7% to 83% of household having access to sanitation (South African Government, 2024). The Western Cape Province, which is the focus of this study, leads with

a 93.8% accessibility followed by Mpumalanga at 68.1%. The Western Cape Department of Health has also established a multi-sectoral team with the aim of reaching the goal of zero diarrhoeal deaths during the annual diarrhoeal season (November to May) to reduce child mortality caused by diarrhoea and other diseases (South Africa: Department of Health, 2014; 2020).

However, although 75 per cent of South African households indicated that members wash their hands with soap and water, only a third have access to hand-wash facilities with soap (South African Government, 2022-23). When it comes to school learner, WHO/UNICEF stated in a 2018 report on WASH in Eastern and Southern African schools that nearly 900 million children lack basic hygiene services with 42 per cent of schools having no drinking water services. In addition, 27 per cent having no sanitation services and 62 per cent having no handwashing facilities (Matthews Ofori-Kuma, 2018). Inadequate WASH services in schools, according to this report, jeopardises learning outcomes, cognitive development, admission, attendance and pass rates, particularly for girls compared to boys of similar age and grade (Matthews Ofoi-Kuma, 2018). Access to WASH thus not only protect against diseases but also enhances children's physical and cognitive development and secures gender equality.

It is not only the availability of WASH facilities at schools that play a role in improving the wellbeing of school children, but also creating an enabling environment through health promotion, education and awareness (Matthews Ofori-Kuma, 2018). An enabling environment is described as:

> *A set of interrelated sector functions that impact the capacity of governments and public and private partners to engage in the water, sanitation, and hygiene service delivery development processes in a sustained and effective manner.* (WASH in Schools Network (WinS Network), n.d.)

The 2018 WASH in Schools (WinS) survey of the Eastern and Southern Africa regions showed a weak overall regional score (43.4 per cent) for the enabling environment for WinS. Only seven of the 21 countries or 33.3 per cent achieved above 50 percent for enabling environment indicators for WinS (UNICEF Eastern and Southern Africa Regional Office, 2018).

In South Africa, that scored 67 percent in the WinS survey, multiple agencies are responsible for creating an enabling environment for WASH in schools. This includes the national and provincial departments of water and sanitation, basic education, and local authorities (Agenbag, 2023).

The sector under scrutiny in this study is environmental health. These local authority employees known as 'health inspectors' by the public, are tasked in terms of Section 81 of the South African National Health Act No. 61 (2003) to ensure water quality monitoring, food control, waste management, health surveillance of premises, surveillance and prevention of communicable diseases (excluding immunisations), vector control, environmental pollution control, disposal of the dead and chemical safety (South Africa, 2003). They are obligated to conduct routine inspections; issue compliance notices and conduct education and awareness programmes to achieve hygiene behaviour changes. With the outcome to prevent the spread of disease.

Behaviour change interventions are defined as multi-faceted, targeted and coordinated sets of activities conceived to change specified behaviour and cognition patterns for individuals, organisations and systems. In this case it refers to WASH behaviours. Such interventions are designed to 1) counter behavioural risk factors; 2) advances protective behaviours (e.g., handwashing); and 3) increase quality and efficiency of services (e.g., hand hygiene compliance) (Davis, et al., 2015; Watson, et al., 2021).

In schools, Environmental Health Practitioners (EHPs) are responsible not only for ensuring compliance with health and hygiene regulations but also but also for health and hygiene education. The latter function is equally important, as it aims to build capacity, instruct teachers and students and foster positive relationships that facilitate co-operation when EHPs enforce regulations (Couch, 2016). Evaluating the impact of such hygiene interventions, whether positive or negative, direct or indirect is critical for improving services, and informing future policy decisions (Clarke, et al., 2019). It is important to determine whether an intervention is fit for purpose, effective, and achieves the desired outcomes (Burches & Burches, 2020).

Unfortunately, the current way of assessing health and hygiene interventions in schools tends to focus on the number of interventions rather than their effectiveness in promoting behavioural change among staff and students (Pradhan, et al., 2020).

The aim of this study was to establish the effectiveness of the health and hygiene interventions of EHPs in schools using the United Nations Children's Fund (UNICEF) Three Star Approach (UNICEF, GIZ, 2013), along with the Integrated School Health Policy (ISHP) and the National Environmental Health Norms and Standards (South Africa: Departments of Health and Education, 2012; South Africa: Department of Health, 2015). The method was designed as an uncomplicated, scalable and sustainable method to assist with WASH and behavioural

change programmes in schools. In essence, schools are rated on a scale of zero to three stars based on the WASH infrastructure and behaviours exhibited by students (UNICEF, GIZ, 2013).

The key elements of the Three Star Approach are:

- **One Star:** Daily routines to promote healthy habits (supervision for handwashing with soap before mealtime and after using the toilet, and access to clean drinking water). This star aligns with the requirement of the Integrated School Health Policy (ISHP), section 2.6 which speaks to the school health pack services.
- **Two Star:** One Star characteristics, with incremental improvements (hygiene education, menstrual hygiene management and the use of low-cost water treatment). This star aligns with the requirements of the Integrated School Health Policy (ISHP), section 2.6 and 4 which speaks to the monitoring and evaluation.
- **Three Star:** One- and Two-Star characteristics, together with meeting the national standards of the country to institutionalise social norms on good hygiene behaviour, while providing students with complete access to WASH to all schools. The ISHP and National Environmental Health Norms and Standards section 8 are the national standards that is a requirement for star three.

The overall goal of the Three Star Approach is to ensure that all children have access to basic water and sanitation, including soap for handwashing, and access to child-friendly, gender-segregated toilets while attending school. It integrates the behaviour of the individual (hygiene awareness through handwashing sessions); the environment (the implementation and maintenance of adequate water and sanitation); and the community (support to raise funds for soap, labour and materials for toilets and handwashing stations) (UNICEF, GIZ, 2013). In this study the Three Star WASH Approach was used as a reference tool, as it covers both the ISHP and the Environmental Health Norms and Standards requirement to evaluate EHPs interventions at schools. These interventions considered the provision of basic water and sanitation, including soap for handwashing, and access to child-friendly, gender-segregated toilets while visiting the selected schools in the Cape Town Metropole in the Western Cape, South Africa.

1.1. Problem statement

Despite the mandated role of Environmental Health Practitioners (EHPs) in conducting health and hygiene interventions within South African primary schools, as outlined in the National

Health Act (South Africa: 2003) and subsequent policies (South Africa: Department of Health, 2013, 2015, 2016b; Agenbag, 2023), there is a critical gap in assessing the *effectiveness* of these interventions beyond mere numerical performance targets (Couch, 2016). While EHPs are tasked with ensuring compliance, promoting behavioural change, and preventing disease (Agenbag, 2023; South Africa: Department of Health, 2014), the current monitoring systems primarily focus on the quantity of inspections and enforcement actions, neglecting the actual impact on school health and hygiene outcomes (Couch, 2016). This lack of comprehensive evaluation, particularly in terms of behavioural change and disease prevention, raises concerns about the optimal use of public resources and the achievement of desired health outcomes in primary schools. Therefore, this study aims to assess the effectiveness of the current health and hygiene interventions conducted by EHPs within primary schools, using a robust methodological approach that goes beyond numerical targets to evaluate the actual impact and sustainability of these interventions.

1.2.   Research question

Principle research question

Using the criteria set by the Three Star Approach for WASH in schools, how effective is the primary school health and hygiene interventions conducted by EHPs in the Cape Metropole area - Cape Town, South Africa.

Secondary questions

1) What or who informs the EHPs' health and hygiene interventions at schools?
2) How do the EHPs conduct their interventions?
3) How do the EHPs monitor and evaluate their intervention(s)?
4) How effective is the EHPs health and hygiene interventions?

1.3.   Objectives of the research

Applying the criteria of the Three Star Approach for WASH in schools, this research study aims to ascertain whether the current environmental health, health and hygiene interventions are effective in the selected primary schools in the Cape Metropole.

The objectives of the study are as follows:
1) To determine how EHPs are informed to conduct a health and hygiene intervention at their school.

2) To determine how EHPs conduct their school's hygiene interventions.
3) To establish if the EHPs' monitoring and evaluation methods are effective.
4) To evaluate the effectiveness of the EHPs' interventions.

1.4.   Delineation of the research

Although schools in all income groups (classified as quintiles one to five) were considered during this study, the random selection process resulted in only quintiles three to five schools being selected. As a result, the socio-economic status and geographic location could not be considered as representative of all schools. This study therefore only considered municipal EHPs' health and hygiene interventions related to planning, implementation, monitoring, and evaluation. Other stakeholders' programmes or interventions (national and provincial sectors such as the Department of Water and Sanitation (DWS); Department of Social Development (DSD) and various non-government organisations (NGOs), have therefore not been considered and offers scope to expand the study.

1.5.   Significance of the study

Environmental health is an integrated discipline that involves prevention and capacity-building to mitigate health concerns, including all diarrhoeal diseases caused by inadequate or a lack of hygiene and sanitation (Ugboko, et al., 2020; Agenbag, 2023). It includes government's reconstruction and development programmes, leading to the sustainable development of a community. Therefore, to achieve sustainable development, the EHPs add to the resilience of a community through conducting research, developing standards and guidelines, and implementing intervention and programmes to address environmental health issues (Agenbag, 2023). As a result, health and hygiene interventions in schools are important for advocating handwashing with soap and water to prevent not only diarrhoea but also various other hygiene-related diseases. Therefore, it is imperative to establish the effectiveness of the current interventions to determine if they are influencing a change in behaviours amongst children and communities (GHP, 2017).

1.6.   Chapter overview

Chapter One outlines the background of the study, providing a brief overview on water, sanitation, and hygiene locally and internationally, the quadruple burden of disease, health promotion and behaviour change trends. After contextualising the situation, the statement of

the problem is presented as well as the research question, research aims, objectives and significance of the study, followed by a summary of the methodology.

Chapter Two presents a review of the literature, defining important concepts for the purpose of the study. It highlights the theoretical framework adopted for the research from various studies.

Chapter Three describes the research methods used in the study. The mixed methods multiple case study procedure (exploratory design) was used to gain a better understanding of the actions of the study group. This includes both quantitative and qualitative data through observation, photographic gestalt, semi-structured interviews, and questionnaires.

Chapter Four details the findings of the research. Each type of data source is analysed separately that is, EHPs, school groundsmen; Grade 7 students and teachers as well as the observations and impressions of the author as researcher-practitioner.

Chapter Five discusses the insights and interpretations revealed in the findings reported on in Chapter 4. In this chapter the data is analysed and discussed in relation to the four objectives set for the study and reveals five themes indicating that EHPs demonstrated:
1. A lack of knowledge of legislation and policy.
2. A lack of strategy for health and hygiene interventions.
3. The lack of resources for the health and hygiene interventions.
4. The need for interdepartmental relationships to be formed.
5. Appropriate training on the evaluation and monitoring (COMBI) tool.

Each objective is discussed separately and informed by data and researcher insights revealed by the findings discussed in previous chapter. It also investigates the limitations of the study.

Chapter Six builds on the insights gained from the data analysis and synthesis regarding adjustments that can be made on local and individual level as well as on national level to improve knowledge, infrastructure, interdepartmental relations, strategy development and training opportunities. Recommendations encompass improvements to practice but also provide an impetus for rethinking theory. Based upon the findings, several recommendations are made with a view to establishing improved practice and effective health and hygiene interventions in schools as well as for further research.

1.7. Chapter conclusion

This chapter introduced the research topic, which is to establish the effectiveness of EHPs health and hygiene interventions in schools in the Cape Metropole. It presented the context, explained the significance of the research problem and formulated the research question as well as the aims, and the objectives of the study. The chapter to follow provides a review of literature on the topics of health promotion, behavioural change, and water and sanitation hygiene, and highlights the theoretical framework adopted for this study from various studies and authors.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

Environmental health services (EHS) are a community's first line of defence in protecting against environmental risks (Agenbag, 2023). This municipal health service has a legal duty to prevent ill health in the community by mitigating environmental health risks at its origin (Agenbag, 2023). Achieving this goal implies a broad list of obligations related to provision of adequate water and sanitation and hygiene services (WASH) as well as disease prevention and health promotion (Anthonj, 2021; Chirgwin, et al., 2021; Tseole, et al., 2022; Yamauchi, 2022). The importance of these is also evident in widely applied health promotion programmes including the UN's 17 Sustainable Development Goals (SDGs) (United Nations, n.d. a). In particular Goal 3 refers to ensuring healthy lives and promoting well-being for all at all ages. According to the UN significant progress has been made with reducing under-5 mortality, improving HIV treatment, childhood vaccination numbers and eliminating a tropical disease. It also reiterates its commitment to end the epidemics of AIDS, tuberculosis, malaria and other communicable diseases by 2030, ensure universal health coverage, and provide access to safe and affordable medicines and vaccines for all. However, inequalities persist while childhood vaccination numbers have declined and tuberculosis, malaria and diarrhoeal deaths have increased since the COVID-19 outbreak (United Nations, n.d. b).

2.2. Status of water, sanitation, and hygiene (WASH) provision

2.2.1. Global status

Despite some progress the 2019 World Health Organization (WHO) report highlights the persistence of a burden of diseases attributable to unsafe drinking-water, sanitation and hygiene (World Health Organization, 2023a). Inadequate WASH interventions are considered the underlying reason for outbreaks of diseases such as cholera, dysentery, hepatitis A and typhoid. Children are particularly vulnerable to preventable deaths such as diarrhoeal diseases (Srivastava & Mishra, 2022), with sub-Saharan Africa regions showing the highest rates of mortality in children younger than 5 years (Gatimu & Kimani, 2022; Kehoe, et al., 2023). Although the WHO's latest report indicates that in 2022, between 54% and 57% of the global population (4.6 billion people) had access to safely managed sanitation services, about 1.5 billion people still lack basic sanitation services. Around three in ten (30%) people worldwide lacked a basic handwashing facility with water and soap at home (World Health Organization, 2023b; World Health Organization, 2024b)**.**

This underscores the principle that health depends on advancements in not only Goal 3 but all 17 SDG targets - poverty reduction; education; nutrition; gender equality; clean water and sanitation, sustainable energy, and safer cities (Agenbag, 2023; Wolf, et al., 2023). The WHO has therefore pinpointed around 50 SDG indicators that specifically measure a population's health traits. This list includes life expectancy, infant mortality, maternal mortality as well as air pollution, water/sanitation and poisoning mortality rates (World Health Organization, 2023b). These are divided into seven thematic areas namely i) reproductive, maternal, new born and child health; ii) infectious diseases; iii) non-communicable diseases (NCDs) and mental health; iv) injuries and violence; v) universal health coverage (UHC) and health systems; vi) environmental risks and vii) health risks and disease outbreaks (World Health Organization, 2023b). Although all seven themes have relevance for local authorities, the last two, environmental and health risks are important for this study as it includes the dangers of unsafe drinking water, inadequate sanitation management, and unhygienic living conditions as causes of death.

According to 2023 WHO report (World Health Organization, 2023b), in 2019, across the globe, approximately 1.4 million deaths or 2.5% of all deaths that year, could have been prevented with safe WASH. This includes deaths as a result of diarrhoea, acute respiratory infections, soil-transmitted parasitic worms and undernutrition. Seventy-nine per cent of these deaths were in African and South-East Asia regions. That is despite various international, national and local organisations implementing WASH programmes such as UNICEF, USAID, WHO, World Vision.

2.2.2. African status

In Africa the USAID focuses on West African countries Burkina Faso, Ghana, and Niger, targeting the most marginalised communities to improve drinking water supply, sanitation coverage, and food security with the West African WASH programme or WA-WASH (USAID West Africa, 2017). The WASH programme provides the infrastructure for the soap-equipped hand washing stations and emphasises sustainable hygiene behaviour change. In Ghana for example a community buy-in exercise run with village elders supporting open defaecation-free (ODF) communities, spontaneously spreading to neighbouring communities (USAID West Africa, 2017). The report states that some of the lessons learnt from the WA-WASH programme between 2011 and 2017, include that behaviour change takes time; the importance of empowering beneficiaries through the programme is by enhancing local capacity. Additionally, fostering self-sufficiency in community approaches and developing

sector skills and knowledge while encouraging sustainability in livelihood opportunities within the communities (USAID West Africa, 2017).

2.2.3. South African status

The literature review investigated the legislation, policies, and strategies that the South African Government has implemented over the past 15 years, and where international agreements on water, sanitation, and hygiene (WASH) have informed the policy frameworks in South Africa.

The importance of WASH is to ensure a healthy and safe environment for communities stated in the UNICEF strategy for WASH 2016 – 2030, which focuses on the sustainable development Goal 6 promoting clean water and sanitation. South Africa's high prevalence of water and hygiene-related illness (i.e., diarrhoeal, and intestinal worms), contributes to malnutrition and subsequently poor school attendance. The WASH campaign started in 2014 within South Africa and by 2017 a strategic bottleneck analysis was implemented to determine what needed to be improved, which resulted in the launch of the National Hand Hygiene and Behaviour Change Strategy (NHHBCS) (South Africa: Department of Health, 2017). Assessing the effectiveness of the current health and hygiene interventions by EHPs is imperative to establish the effectiveness of efforts taken to optimise its less costly preventative role. Although environmental health plays a crucial role in preventative health, contributing to the various SDGs, one being clean water and sanitation. The prevalence of health inequality in post-apartheid is still evident and consequently an underlying element that is fundamental to this research (United Nations Children's Fund (UNICEF), 2017). The South African section of UNICEF and the Water Research Commission of South Africa (WRCSA) signed a memorandum of understanding (MOU) on the 25 July 2022 to facilitate and support the WASH systems. This included water quality, climate change, food systems and nutrition, as well as youth and sanitation activities, which emphasise the need for a sustainable solution (United Nations Children's Fund (UNICEF), 2022).

With that said, in South Africa, the chief director of Environmental Health and Port Health Services has driven the development and finalisation of the NHHBCS 2016–2020. This strategy seeks to address the critical areas mentioned to mitigate environmental health-related diseases through knowledge transfer. The foundation principles of WASH form the basis of the strategy, which is to mitigate the prevalence of diarrhoea and other diseases that are caused and sustained by insufficient water, sanitation, and hygiene. This strategy links to the Integrated School Health Policy (ISHP) emphasising the collaborative approach from various departments, such as the national Departments of Health (DoH), Department of Basic

Education (DBE), Department of Social Development (DSD), Department of Water and Sanitation (DWS) and Department of Human Settlements (DHS) as well as relevant Non-Government Organisations (NGOs). Hygiene promotion is increasingly coming to the forefront as the behaviour change approach by focusing on the importance of washing hands. This includes the steps and techniques applied to facilitate behavioural change at critical stages, such as washing hands after using the toilet, changing nappies, before eating and before feeding a child. These practices should be applied at home, school, work and while socialising. Therefore, the need is to involve all role players and those in a leadership position in influencing children at an early age (South Africa: Department of Health, 2017).

2.3. Water, sanitation, and hygiene (WASH) in schools

The 2023 WHO report (World Health Organization, 2023b), specifically refers to WASH services in institutional settings such as schools, workplaces and health care facilities and possible interventions that can be implemented by countries to improve their WASH standards. Three years before, WHO and UNICEF had released a joint report stating that approximately 818 million children lack basic handwashing facilities at their schools, resulting in 2 out of 3 children without basic hygiene services in two of the SDG regions and Sub-Saharan African region (United Nations Children's Fund (UNICEF) and World Health Organization (WHO), 2020). The same report also mentions that seven out of ten schools lack basic handwashing facilities, and half of the schools across the world lack basic sanitation and water services exposing children at risk of contracting diarrhoea, and other transmittable diseases such as the newfound pandemic of COVID-19 and the spread of cholera (United Nations Children's Fund (UNICEF) and World Health Organization (WHO), 2020).

Focusing on a WASH South African context, Radebe, et al. (2025) conducted a study in the uMfolozi Local Municipality, Kwa-Zulu Natal, South Africa, where 49 primary schools were analysed, focusing on the provision and condition of drinking water, sanitation, and hygiene facilities. The study found that while most schools had water provision, none had a water quality-monitoring plan, raising concerns about water safety. The most used drinking water supply sources were rainwater and schoolyard piped water, while borehole was the least used. The study concluded and stated that, 58% of primary schools in this study fall under the "no service" category and form part of a water backlog, according to the Department of Water and Sanitation. Furthermore, a study in the Vhembe District, Limpopo, South Africa focused on a knowledge, attitude, and practices (KAP) survey on water, sanitation, and hygiene in selected schools. Where the study used questionnaires, inspections of sanitary facilities, and discussions with school authorities to assess the KAP of learners on issues related to water,

sanitation, and hygiene. The study revealed that while the level of knowledge about waterborne diseases was relatively high, knowledge on transmission routes was inadequate. The attitude and practice on hygiene was found to be high. However, the water supply and sanitation facilities were inadequate in rural schools, with no handwashing areas and no sanitary bins for girls (Sibiya and Gumbo, 2013).

2.3.1. Childhood diarrhoeal disease

Every year approximately 1.7 billion cases of childhood diarrhoeal disease are reported with around 443 832 children under 5 years old and an additional 50 851 children aged 5 to 9 years dying from it (World Health Organization (WHO), 2024a). As a significant proportion of diarrhoeal disease can be prevented through safe drinking-water and adequate sanitation and hygiene, it remains prevalent in indigent communities. Sub-Saharan African and South Asian countries are particularly vulnerable to these types of diseases (Dattani, et al., 2023).

A 2021 review assessing literature on the effects of handwashing promotion interventions on curbing diarrhoea, cited nine studies involving 4 664 children in schools and ECD centres in high-income counties, and two studies (45,380 children) in low-income countries (Ejemot-Nwadiaro, et al., 2021). According to the authors, in low- to middle-income countries that encourages handwashing almost certainly reduced the number of cases developing diarrhoea up to the age of 15 years (Ejemot-Nwadiaro, et al., 2021).

The data on diarrhoea prevalence in South Africa are inadequate, specifically in older children and adults (Johnstone, et al., 2020). Research focusses on children under 5 years as this group is more prone to illness and tend to seek healthcare more often. During the COVID-19 pandemic, the WHO and UNICEF released a report stating that 818 million children lack handwashing facilities at their schools with two out of three children in sub-Saharan African schools being without basic hygiene services. This increases the risk of transmission of infectious diseases such as COVID-19 and other transmittable diseases like diarrhoea. Therefore, interventions to improve access to clean water, sanitation and hygiene services must ensure infection prevention control (United Nations Children's Fund (UNICEF) and World Health Organization (WHO, 2020).

The latest WASH report for South Africa was published during 2017 where it stated that the leading underlying causes of death among children between the ages of 1 to 14 years old was that of intestinal infections (i.e., diarrhoea). With 2.6 million households that did not have access to safe drinking water, while 400 000 households did not have toilet facilities it

perpetuate the preventable risks (United Nations Children's Fund (UNICEF), 2017). While almost 400 schools in South Africa are without water, and about 3 400 still uses pit latrines, most of the schools in the Western Cape make use of municipal supply of water and sanitation (Jones, 2021; Odeku, 2022). Matthews Ofori-Kuma (2018) reminded us that without proper management and maintenance, any new or repaired toilet facilities could quickly turn into unsafe facilities that pose a health risk due to unhygienic conditions.

According to a study conducted in Soweto, another urban area in South Africa "diarrhoeal rates in older age groups are high at a community level but are missed through routine healthcare- or laboratory-based surveillance" (Johnstone, et al., 2020:9). The authors recommend that interventions and health awareness messaging emphasise handwashing practices including for men and households without young children. Yet the fatality rate due to diarrhoea has shown a continuous decrease since 2011 result of improved breastfeeding rates, slightly improved immunisation coverage and increased access to water and sanitation the contributing causes of the diseases are still prevalent (Massyn et al., 2019; Ndlovu & Padarath, 2024).

2.3.2. Integrated School Health Policy (ISHP)

The South African DBE in conjunction with the DoH, have jointly introduced the ISHP to improve school health services to primary and secondary schools (South Africa: Departments of Health and Education, 2012). The programme offers a substantial component of health education including how to lead a healthy lifestyle and onsite services such as deworming and immunisation.

The aim of the ISHP is to build and strengthen existing school health services and to commit the collaboration among the DoH, the DBE and the DSD, to take joint responsibility within the various legislative frameworks, policies and programmes. In short, it is established to ensure the improvement of the schools' environmental conditions. The aim is to address the health obstacles to improve education outcomes and to retain students and their achievements at schools, thus developing school going children and communities in which they can live and learn (South Africa: Departments of Health and Education, 2012). The primary target is the children within the school system, including those with special needs. The secondary target is the school community, which is the school's management, teachers, administrative personnel, parents, and other caregivers. Accordingly, a crucial element in the ISHP is the consideration of health education and promotion, as it affords the best prospect of influencing children and

youths' immediate and long-term healthy behaviour (South Africa: Departments of Health and Education, 2012).

The programme uses a ranking and funding system that categorises the schools into quintiles based on the socio-economic circumstances of the students' schools in each province. These are classified into five groups, known as quintiles, from poorest (quintile 1) to richest (quintile 5). The five quintiles are divided into 20% groups of the provincial schools. Therefore, quintile 1 is a group of schools, in each province, catering for the poorest 20% of schools, and quintile 2 caters for the next poorest 20% of schools. Quintile 5 schools represent the least poor schools. Schools receive funding on a sliding scale from government according to these quintiles. Quintile 1 schools receive the highest allocation per learner, whereas quintile 5 schools receive the lowest (South Africa: Department of Education, 2004). Funding is skewed towards the poorest students, i.e., the lowest quintile schools (quintile 1) (South Africa: Departments of Health and Education, 2012). For example, the maintenance guidelines in the former Department of Education (DoE) norms and standards for school funding, make recommendations regarding monetary allocation to quintile 1 schools to include the improvement of outstanding neglected school buildings, basic yearly maintenance of fencing and repairs, whereas quintile 4 and 5 schools would receive funds for repairs and maintenance only (South Africa: Department of Basic Education, 2012).

The above principle speaks to Marmot (2017), stating that the overall recommendations for the commission of social determinants of health are to improve daily living conditions by tackling the inequitable distribution of power, money, and resources. In addition, the commission seeks to measure and understand the problem and assess the impact of an action, with the holistic approach of targeting the social determinants of health in the individual and in society (Marmot, 2017). The ISHP echoes Marmot's approaches, where the policy supports the school health package that comprises health screening, on-site service, and health education. Health education is incorporated into the school curriculum through the subject Life Orientation. There is an instruction to schools that the health promotion officer or EHP should provide health education. This includes various topics such as nutrition and exercise, personal and environmental hygiene, chronic illnesses, and mental health. The education content should be relevant to the particular age group or phase, for example, junior, intermediate, and senior level (South Africa: Departments of Health and Education, 2012). The ISHP focuses on environmental health topics such as handwashing, personal and environmental hygiene, and environmental illnesses, which are required to be included across the three school phases for health education. The ISHP recognises that environmental health intervention is not limited to health education, instead, it also considers an environmental

assessment. Such an assessment considers a school's first aid kit; water; sanitation; cooking area; physical safety; ventilation (to prevent airborne infections); waste disposal; food gardens and recycling (South Africa: Departments of Health and Education, 2012).

The aim with, and the implementation of the 'health promoting schools' within the ISHP, is to foster multi-sectoral health learning with the allocated resources from both the DBE and the DoH. This ensures engagement with health and education officials, including parents and community leaders. The ISHP leading with the effort to promote health, which ties into providing a healthy environment for both the school and community. This is done through school health education, health services, and school/community projects and outreach. All the various stated interventions strive to improve the health of school personnel, families, community members and students. The ISHP emphasises the importance of close co-operation with community leaders to help them understand how the community can contribute by either supporting health and education or discouraging it. The rationale for the ISHP is that the collaborative implementation of policies, practices, and other measures takes place. Additionally, to respect the individual's self-esteem, provides opportunities for success and acknowledges reasonable efforts, and intentions of all involved, to support everybody's personal achievements (South Africa: Departments of Health and Education, 2012).

Based on the delegated functions of the Municipal Health Services (MHS) and the principles of the ISHP, environmental health promotion aims to empower people to increase control over and improve their health. This can be done through monitoring and evaluation practices to ensure coverage of services such as water, sanitation, and access to drinking water – all to ensure the quality of services and to mitigate disease outbreaks before they occur (South Africa: Departments of Health and Education, 2012).

2.4. Environmental health services in South Africa

Environmental health services (EHS) as the first line of defence in environmental health (Agenbag, 2023), is tasked with preventing and managing health risks in the populace including children at schools. The National Health Act (NHA) Act No. 61 of 2003 (South Africa: 2003) describes municipal health services (MHS), which includes water quality monitoring; food control; waste management; health surveillance of premises; surveillance and prevention of communicable diseases (excluding immunisations); vector control; environmental pollution control; disposal of the dead and chemical safety. The scope of the profession that determines its powers; functions; and duties and obligations is outlined in the NHA (South Africa: 2003; South Africa, Department of Health, 2009); South Africa: Department of Health, 2013;

Agenbag, et al., 2022; Agenbag, 2023). This was expanded in 2013 with the publication of the National Environmental Health Policy and in 2015, the National Environmental Health Norms and Standards for Premises and Acceptable Monitoring Standards for Environmental Health Practitioners (South Africa: Department of Health, 2015), being promulgated under the NHA. These expanded obligations also underscore the importance of co-operative governance with other sector departments such as the Department of Environmental Affairs (DEA), DWS; DBE and DSD for the effectiveness of EHS.

The first norms and standards audit of MHS was conducted during 2016 to (South Africa: Department of Health, 2015) gauged the level of EHS delivery in the country. The initial audit painted a bleak picture, with 33% (n=17) of the 52 MHS authorities having such weak systems in place making it difficult to render MHS even at the most basic level (South Africa: Department of Health, 2016a; Makhafola, et al., 2017).

2.4.1. Functions and obligations of environmental health services in South Africa

2.4.1.1. Ensuring compliance

Section 82 of the National Health Act, 2003 (61 of 2003) makes provision for EHPs, as "health officers", to conduct routine inspection and issue compliance notices to ensure compliance regarding the functions listed.

2.4.1.2. Environmental health promotion for behavioural change

However, more time is spent by EHPs conducting education and awareness programmes in communities to build their capacity and to facilitate co-operation as part of EHPs' enforcement functions (Couch, 2016). The National Environment Health Policy emphasises the importance of environmental health awareness and education to capacitate communities through inter-sectoral collaboration. This is to subsequently address historical imbalances and to facilitate a sustainable safe and healthy environment for communities (South Africa: Department of Health, South Africa, 2013; Agenbag, et al., 2022; Agenbag, 2023).

The DoH's National Health Promotion Policy and Strategy (NHPPS) 2015–2019 (South Africa: Department of Health, 2014) is a multi-sectoral and multi-disciplinary effort to increase and promote the government's vision of "a long and healthy life for all South Africans". The aim is to improve life expectancy, reduce maternal and child mortality rates, combat HIV/AIDS and TB, and improve the healthcare system. The policy recognises that health promotion is not

limited to specific health problems or behaviours. Instead, it encompasses health education but also, social and behavioural change strategies. Another fundamental facet is communicating the message using the information, education, and communication (IEC) approach; social marketing, advocacy; and social and community mobilisation. In addition, it involves providing the legislative framework to regulate health promotion to achieve the outputs of the NHPPS 2015-2019 (South Africa: Department of Health, 2014).

In support of the NHPPS 2015-2019, Goal 6 of the National Environmental Health Strategy (NEHS) 2016-2020 (South Africa: Department of Health (DoH), 2016b), underlines the need for empowering and mobilisation of individuals and communities through environmental education, awareness, and participation. The policies centralise the community in a sustainable framework by integrating the community members, local health department staff, various community and health organisations involved in the decision making and implementation thereof. The policies suggest that communities should create local solutions for local problems by establishing the following methods to ensure service delivery:

- Communicating the status of environmental health and environmentally related illness, disease, and injury to the community.
- Designing culturally appropriate environmental health information, environmental health education and environmental health promotion activities to reduce environmental health risk and promote better health.
- Maintaining accessible environmental health information and educational resources, targeting environmental health education activities to specific groups as necessary.
- Establishing emergency risk communication processes designed to inform and mobilise the community regarding environmental health threats or crises.

Health promotion must enable individuals to increase control over their health (South Africa: Department of Health, 2014). Empowering an individual requires a range of social and environmental interventions to protect and prevent the root cause of ill health at the origin. Rather than merely focusing on the treatment or cure of the symptoms (Rural Health Information Hub, 2022).

The WHO Communication for Behavioural Impact (COMBI) tool, introduced in 2012, has become a standard instrument to achieve behaviour change results towards prevention, and control responses with disease outbreaks. The COMBI tool is a planning framework and implementation method for communication. It is based on behavioural models, and communication and marketing theory and practice to achieve behavioural results in public

health programmes (World Health Organization (WHO), 2012). Although health programmes intend to inform, educate, and convince people about what should be done, it often fails to have any behavioural impact (World Health Organization (WHO), 2012). The COMBI has taken aboard concepts from the private sector that has shown to be very effective in influencing consumer behaviour. Therefore, the COMBI approach can fill the gap with the current health interventions that does not sufficiently produce behavioural impact (WHO, 2012). It follows two guiding principles: 1) determining the preliminary behavioural outcome before producing material (e.g., posters, pamphlets, or radio broadcasting); and 2) conducting a rapid situational analysis to refine the desired behavioural outcomes and the best way to engage with the community. This underpins the COMBI's seven-step planning tool:

Step 1: Identify the preliminary behavioural objectives.

Step 2: Conduct a rapid situational market analysis.

Step 3: Refine the behavioural objectives and state the communication objectives.

Step 4: Design an overall strategy.

Step 5: Prepare a budget for implementation and monitoring plans.

Step 6: Implement and monitor the strategy, identify trends and adapt if necessary.

Step 7: Evaluate once the outbreak is over.

All the steps have interlinking tools to identity and engage stakeholders and existing expertise. This aids to ensure that management and administrative response structures are in place to support the programme. The COMBI tool therefore appears to be useful for supporting one of the functions of EHPs under the National Health Act, namely, the surveillance and prevention of communicable disease, which can be linked to various other roles and functions (World Health Organization (WHO), 2012). Additionally, the COMBI tool aligns with the National Health Promotion Policy and Strategy 2015-2019 and the NEHS 2016 – 2020. Thus, buttressing the monitoring and evaluation functions to ascertain whether the education and awareness programmes are successful in achieving its objectives.

Tool 16 in the COMBI tool provide guidelines for monitoring and evaluating, the format and budgetary aspects of the interventions, as well as process and behaviours. It offers examples of the types of questions asked in each form of monitoring, with some examples of indicators and methods of collecting the information (World Health Organization (WHO), 2012).

2.4.1.3. Primary health care and disease prevention

Some authors argue that environmental health services is a critical element of primary health care (PHC) services and disease prevention (Agenbag & Balfour-Kaipa, 2008; May & Agenbag, 2021). This was shown to hold water during the COVID-19 pandemic when a complete COVID-19 book of guidelines was written for EHPs to manage the outbreak as part of the outbreak response team. They were tasked with investigation of suspected cases and contact tracing; monitoring and management of human remains; monitoring the disinfection of affected areas; conducting health education and awareness, and health promotion, while following a multi-stakeholder approach for all activities (South Africa: Department of Health, 2020).

South African EHPs have their work cut out for them in the context of the health inequality in the country. Marmot (2017) states that in mutually affluent and impoverished countries, people's health predominantly depends on the social conditions in which they live and work. Subsequently emphasising the social determinants of health (Omotoso & Koch, 2018), arriving at a similar conclusion as Marmot, stating that socio-economic inequalities related to social determinants are linked to education, income, housing, and residential location. These being the contributing factors to ill health. Rapid urbanisation leading to a growth of informal settlements and backyard structures within city areas, negatively affects the environmental health status of the communities. Such conditions lead to an increase in environmental health-related diseases such as diarrhoea and pneumonia. This is due to the lack of proper sewage collection and disposal, the absence of solid waste collection, a lack of safe and sufficient water supply, overcrowding, poor living conditions and inadequate housing.

The South African NEHS 2016-2020 aims to achieve an equitable and sustainable health outcome for all South Africans (South Africa: Department of Health, 2016). Goal 5 of the strategy focusing on the partnership approach to facilitate holistic and integrated planning in environmental health. While Goal 6 focusing on the empowering and mobilisation of individuals and communities through environmental health educations, awareness, and participation. In addition, Goal 2, focuses on environmental health monitoring and the evaluation of the environmental health status of communities. This continues the monitoring and evaluation of community conditions to identify environmental health risks playing a critical role as an early warning system to mitigate associated disease outbreaks (South Africa: Department of Health, 2016).

2.5. Environmental health service in South African schools

Although the DBE health promotion and the South African NEHS are implemented separately it does align as reflected in its strategic objectives. Both strive to increase knowledge and awareness of health promoting behaviours. Develop systems for the mainstreaming of care and support for teaching and learning; increase sexual and reproductive health knowledge, skills and decision making among students, educators, and school support staff. Finally, to facilitate early identification and treatment of health barriers to learning; and increase knowledge and awareness of health promoting behaviours (South Africa: Departments of Health and Education, 2012). In short, the golden thread running through these policy documents is to increase knowledge, awareness and change in behaviour to ensure a conducive environment that can support sustainable communities and teaching at schools.

As such it requires input from other stakeholders besides the DBE and DoH. Environmental health services are required to perform its duties of checking compliance with the environmental health and safety requirements, it is mandatory to inspect school premises to ensure the safety of students and school staff on a regular basis, usually annually (Nell, 2022). The guidance of these requirements can be found in the National Environmental Health Norms and Standards (2015), which focuses on the water quality; food safety standards; waste management; smoking; compliance of school buildings with national building regulations; availability and compliance of toilet and wash-up facilities. Furthermore, there are individual legislation that governs a food premises such as Regulations Governing General Hygiene Requirements for Food Premises, the Transport of Food and Related Matters (2018).

2.6. Assessing environmental health interventions for effectiveness

The success of any programme including EH interventions being implemented in such a way that it achieves the outcomes set beforehand. With the importance to make sure that public resources often used for EH programmes, are used optimally. We say such an intervention has to be effective and implemented efficiently. Though dictionaries consider the terms, effectiveness, efficacy and efficiency as synonyms, they are in fact not. This study uses the term *effectiveness* when measuring hygiene interventions in schools as it refers to the degree to which something is successful in producing a desired result (Burches & Burches, 2020). *Efficiency*, on the other hand, is the "state of being efficient", and *efficacy* is "the ability to produce a desired or intended result" (Burches & Burches, 2020). The Austrian-American management consultant, Peter Drucker distinguishing among the terms as follows: *effectiveness* is doing "the right" things, to achieve planned outcomes, goals, or objectives

and desired effects, under ordinary circumstances (not controlled circumstances such as in a laboratory). Where *efficacy* is getting things done while *efficiency* is maintaining a good input to output ratio. Effectiveness according to (Burches & Burches, 2020) links with the notion of external validity or whether the findings can be generalised to other programmes and contexts that varies from the original.

Measuring effectiveness serve many purposes. It detects a programme's strengths and weaknesses; identify trends and patterns; help improve performance and making data-driven decisions. It supports commitment and accountability to stakeholders and employees, fostering trust and credibility. Measuring effectiveness also help organisations to improve employee performance. Performance metrics is applied to monitor goal achievement and provide feedback on their performance. Performance measurement is an important aspect of performance management (Korhonen, et al., 2023).

While it is a legal obligation for EHPs to conduct school health and hygiene interventions, the official performance monitoring processes focus only on the number of interventions conducted according to performance targets. The typical performance agreements tend to calculate how many sites were inspected, complaints dealt with, fines or summonses meted out are completed per day. In some cases, EHPs were fined if performance targets are not reached (Couch, 2016). The effectiveness of the interventions, whether compliance inspection or behaviour changing programmes, is seldom assessed.

Despite studies showing that this state of affairs is perturbing to EHPs in the field, as they question whether it actually measures their effectiveness. Couch (2016) state that although they acknowledged the purpose of targets and punitive measures, they expressed doubt as to the value thereof without taking into account the education and awareness raising activities impact. However, the participants of this particular study indicated that their suggestions of "alternative targets to be more aligned to the outcomes of their work", were not acceptable to senior management (Couch, 2016).

One reason why health interventions tend to have a numerical foundation, is because EH interventions are complex; involve many stakeholders and take place on many levels (Breuer, et al., 2016; Barnes, n/d). According to Barnes (n/d) when assessing the success of environmental health programmes, two questions need to be answered: 1) how effective was the programme and 2) why did the programme work or not work?

Regarding the first question, literature show that robust systematic methods to measure how effective environmental health interventions are, has been designed in recent times (Sutton, et al., 2021; Barnes, n/d). These are evidence-based, empirically validated *in situ* rather than based on "expert-based narratives" (Sutton, et al., 2021).

The second question is more difficult to answer as it requires understanding the underlying assumptions of the programmes, the theory of change and the specific factors that prompted the behavioural change. Barnes (n/d) suggests that it is important to develop a programme theory before the evaluation to explore "possible causal bio-psycho-social pathways for how and why an intervention may work". Afterwards it shapes the framework for describing how and why changed happened (theory of change). The theory of change reflects the sociological or psychological theories which describe why change occurs (Breuer, et al., 2016).

Although, a literature review indicated a number of evaluations that compare the effectiveness of the different hygiene behaviour changing interventions, this study applied the Three Star Approach to classify interventions as a way to establish the level of effectiveness.

2.7. UNICEF's Three Star Approach

The Three Star and the COMBI approach provides the management framework and foundation that incorporates principles of the ISHP, National Environmental Health Norms and Standards, and WASH. Makes the UNICEF Three Star Approach a multifaceted approach for school health programmes. These principles are emphasised in the literature review, which are needed to make such hygiene behavioural change interventions more effective, through adequate health and hygiene interventions linked with appropriate monitoring and evaluation of implementation and progress. Therefore, in this study, the use of the Three Star Approach and the COMBI framework will be used to gauge the effectiveness of the EHPs school hygiene intervention programmes.

The Three Star Approach was designed by UNICEF in 2013 to improve the effectiveness of programmes on hygiene behaviour change to promote safe, healthy, and protective learning environments for children (UNICEF, GIZ, 2013; Wilbur, et al., 2022). There are two main stages, which starts with a school committing to the overall approach – making them a "No-star school". The second stage is meeting the minimum requirements, advancing to a "One Star school", with minimal financial investment. Table 2.1 explains the Three Star categories, with each category's criteria focusing on achieving the expected outcomes. These criteria

demonstrate the indicators for the various stars, which was used in the questionnaire in the current study. Additionally, this was used to assess the compliance status of the schools with the national policy objectives, and to assess the effectiveness of the EHPs' interventions. One Star focuses on the behaviour change of both the community and various parties within schools, and two stars focuses on the availability and functioning of infrastructure for water, sanitation, and hygiene, which requires financial assistance and support from communities. Where the provision and maintenance of water and sanitation infrastructure is required, it provides an opportunity to contribute economically to the community through job creation. Finally, Three Stars indicates compliance with the governmental regulations, norms and standards, while continuing with the ongoing practice of hygiene behavioural change (UNICEF, GIZ, 2013). For this study, the Integrated School Health Policy (ISHP), and the National Environmental Health Norms and Standards are used as the national compliance standards as stipulate under the third star requirement (South Africa: Departments of Health and Education, 2012; UNICEF, GIZ, 2013; South Africa: Department of Health South Africa, 2014).

Table 2. 1: Description of the Three Star Approach criteria as designed by UNICEF (2013)

Stars	Criteria to be met	Outcomes
One	Handwashing with soap sessions ideally before the school meal, with all children participating via daily group supervision.	• Creating a habit of handwashing with soap. • Reinforcing the washing of hands with soap and water before eating. • Learning proper handwashing techniques. • Hygiene education can be conducted within the group handwashing sessions provided.
	Basic gender-segregated toilets are functional, clean and used by all children (no open defaecation).	• Toilets are used because they are clean. • Water and soap are available in toilets. • Elimination of open defaecation in and around the school premises. • Children learn the importance of sanitation through active participation.
	The correct use of personal drinking water for every child.	• All children to have access to drinkable water at school.
Two	Handwashing is completed with soap and water after a child uses the toilet.	• Crucial handwashing habits are created with soap and water (i.e., before meals – daily group handwashing sessions and after defaecation). • The use of handwashing stations is demonstrated to the community.

		•	Girls gain knowledge and support to manage menstrual hygiene.
	Improved sanitation and menstrual hygiene facilities are available.	•	Additional toilets are available at school for boys and girls.
		•	Girls are encouraged to attend classes because there are additional private sanitation and menstrual hygiene management facilities.
	Drinking water is available at school.	•	Children have access to safe drinking water at school.
		•	Low-cost water treatment is demonstrated to the community.
Three	School facilities and systems are up graded to meet national standards.	•	Social norms on good hygiene behaviour are institutionalised.
		•	The school can offer complete accessibility to WASH to all students, including children with disabilities.
		•	National inequities are eliminated by ensuring all schools in the country have the same standards for WASH schools.

Not forgetting the monitoring and certification process of the Three Star Approach, a school will undergo an inspection, either via a school inspector or an education outreach worker. In South Africa's case, it could be the EHP based on their routine environmental health assessments stated in both the ISHP and the National Environmental Health Norms and Standards (South Africa: Departments of Health and Education, 2012; South Africa: Department of Health, 2015). Within a theoretical founding and participatory monitoring, a holistic approach would be taken with various departments such as the DoE, the DWS, the DSD and the DoH. All taking ownership to ensure a school would reach a Three Star rating. By awarding a certificate to qualifying schools that are attached to each star level, creates an opportunity to improve the conditions at the schools. The continued monitoring of the schools ensures that the star level is maintained or improved as conditions change (UNICEF, GIZ, 2013).

United Nations Children's Fund (2021) published a formative evaluation report on the Three-Star approach for WASH in schools in the Pacific regions which looked at the activities from 2018 till 2021. With the purpose to evaluate the replicability and scalability of the Three-Star approach within schools. UNICEF identified five categories for the key findings being 1) relevance, 2) coherence, 3) efficiency, 4) effectiveness and 5) sustainability. For the purpose of this study, it is important to elaborate further on the categories, where:

1. Relevance speaks directly to the alignment of the changing policies and priorities required, as a critical weakness is the lack of detail on resilience, both on country and regional level.
2. Coherence focused on the buy-in of various ministries/departments, and the national roll-out coming from government, with the inclusion of various stakeholders.
3. Efficiency looked at the systemic weaknesses due to the limited capacity of supplies and resources within the country, which posed a challenge, but did not hinder the programme.
4. Effectiveness proved with clear evidence the improvement within the school, with policy reformation and improvement within the environment. However, identified that there are unique needs for children with disabilities.
5. Sustainability requires 'change makers' being the constant advocate for the programme, to assist with the supply-demand and to constantly motivate their school (United Nations Children's Fund (UNICEF), 2021).

Thus, one of the main recommendations from the report was to develop an implementation model based on a theory of change, with specific indicators, alongside monitoring and reporting tools. The report suggested that children with disabilities should be added as a priority, while local ownership and sustainability within the community and schools requires focused attention (United Nations Children's Fund (UNICEF), 2021). The agenda from the DoH by way of the ISHP, the National Environmental Health Norms and Standards, and the National Hand Hygiene Behaviour Change Strategy 2016–2020 can be evaluated through the simple, scalable, and sustainable principle of UNICEF's Three Star Approach.

In addition, the COMBI's monitoring and evaluation component assess the health communication effectiveness by monitoring if results were achieved or were not, to adjust control measures appropriately. This is for example where it is measured if everyone is washing hands and if there is a reduction in intestinal infections. If the education is not producing the requisite results, it might be that the problem is associated with technical and infrastructural recommendations (World Health Organization (WHO), 2012). To conduct effective monitoring and evaluation, three questions are asked: (1) Are we doing the right things? (2) Are we doing it properly? and (3) Are we making a difference? (World Health Organization (WHO), 2012). The monitoring and evaluation should also be part of the EHPs routine tasks when planning and conducting health and hygiene awareness programmes in communities to ensure that behavioural change occurs. The aim with objective 3 in the study, is to establish if the EHPs use COMBI principles for their planning, evaluation, and control for their school's intervention. Questions 7, 8 and 16-22 of the EHPs semi-structured questionnaire focuses on the planning, monitoring, and evaluation.

This approach seeks to assess the effectiveness of primary school health and hygiene interventions by EHPs in the Cape Metropole area. It is anticipated that using the Three Star Approach, together with the COMBI tool ultimately assess the effectiveness of the EHPs interventions and the status of WASH in schools. Subsequently, using the tools in harmony facilitates compliance with the ISHP, National Environmental Health Norms and Standards, and the Hand Hygiene Behaviour Change Strategy 2016–2020 (South Africa: Departments of Health and Education, 2012; South Africa: Department of Health, 2017).

In summary, WASH focuses the study on water, sanitation and hygiene in schools that is critical for healthy communities and children at schools. Subsequently, the Three Stars is used as a tool to assess the conditions in and around the schools to ascertain if they meet the WASH criteria. The COMBI tool was used to establish if the EHPs use it or its principles to plan and implement their awareness programmes at schools. In unison the Three Star and COMBI is also used to establish the effectiveness of the EHPs' interventions to facilitate sustainable behavioural change. These concepts have been further explained under water, sanitation, and hygiene that leads into the Three-Star Approach speaking to the various outcomes set by both Department of Health (DoH), and the Department of Basic Education (DBE) of South Africa (Department of Basic Education, 2021).

2.8. Conclusion

In conclusion, the South African Human Rights Commission (SAHRC), focusing on the right to water and sanitation, stated in 2019. Where no person should be left behind, while in November 2016, no school should have been without water and sanitation, with all pit latrines eradicated. However, in 2021 there are still about 400 schools without water, and 3 400 schools having only pit latrines. Subsequently, environmental health is an integral part of Primary Health Care (PHC), as it contributes to the promotion of wellness and prevention of disease, through controlling environmental factors. Consequently, having a negative impact on one's health, which includes conditions at schools. However, globalisation has added to the rapid transmission of infectious disease, with the link to environmental health and diseases becoming more evident. Within the South African context, the main environmental health challenges are water, sanitation, waste, and food control. The lessons learned from the WASH implementation at various countries shows the value to have a focused approach to address water, sanitation and hygiene challenges at schools.

According to the literature review, South Africa's policy and strategies align with international frameworks, all linked to the SDGs and the fight against health inequality. The question

remains whether the different legislation, policies and strategies are being filtered down to the EHPs and various departments. As they are to be the implementers in achieving the numerous goals of the policies and strategies put in place. With the founded knowledge and frameworks, this study aims to establish whether EHPs are effective in their current health and hygiene interventions to reduce diarrhoeal disease caused by unsafe water, inadequate sanitation and poor hygiene at schools in the Cape Metropole. The study also aims to establish whether the interventions are done according to policies and strategies and whether it has achieved the desired outcomes using the Three Star Approach and the COMBI framework. This study will emphasise likely disconnect between policy expectations and policy implementation.

CHAPTER 3: METHODOLOGY

3.1. Introduction

This chapter explains the methodology used to obtain data, and the analysis thereof, to draw out a response to the research question: Are the primary school health and hygiene interventions effectively conducted by EHPs in the Cape Metropolitan area, Western Cape? The aim of the study is therefore first to investigate how EHPs are informed in conducting health and hygiene interventions at schools. Secondly, it seeks to investigate and observe how EHPs conduct these health and hygiene interventions at schools. Thirdly, to establish if the EHPs' monitoring and evaluation methods are effective.

The various schools are serviced by EHPs from different sub-district offices within the Cape Metropolitan area. This required a mixed methods multiple case study design using various data collection techniques with various participants (EHPs, teachers, students, groundsmen and researcher as observer). This method was chosen to achieve the objectives of the study and to answer the research question and associated objectives.

The theoretical framework that forms the reference tool of the study and against which EHP's primary school health and hygiene interventions were evaluated, was underpinned by three different instruments. One being the UNICEF Three Star Approach, followed by the ISHP collaboratively developed by DoBE and DoH, and the Environmental Health Norms and Standards. The chosen theoretical framework links the underlying assumptions, concepts and broader knowledge relevant to the study, being presented in Chapter 2 and used to investigate the research problem (Hiebert, et al., 2023).

These reference tools were used to set criteria to assess health and hygiene interventions in selected schools as well as to compare school health and hygiene interventions among schools. The research design, research setting, and data collection techniques will be discussed in this chapter, including the participants and locations of where the data were obtained. The chapter closes with the limitations and ethical requirements of the research study.

3.2. Research design

As mentioned earlier, this study uses a mixed methods multiple case study design. *Mixed methods* in this case refers to collecting and analysing both quantitative and qualitative data

within the same study. A *case study* is used to explore a particular problem, individual, group of people, organisation or event to answer the "how" or "why" questions (Priya, 2021). Case study research involves qualitative methods, but allows for exploring "in-depth, multi-faceted explorations of complex issues in their real-life settings (Crowe, et al., 2011), it is often used in conjunction with other methods in a single investigation.

Mixed methods case study research is an inductively driven or bottom-up design, where the researcher develops theories or hypotheses from the data collected and analysed. The starting point is specific observations generalised broader theories or ideas. Although the mixed methods case-study approach is at times criticised for being ambiguous (Yin, 2018). Yet authors also emphasise the benefits and provide guidance for well-planned case studies to get in-depth and rich insights in unknown areas (Bowen, et al., 2017; Schoonenboom & Johnson, 2017; Yin, 2018).

Examples of studies using a mixed method approach that include both qualitative and quantitative data collection and analysis, include Ehsan and Spini's 2020 mixed methods case study investigating community base interventions, focusing on place, social capital, and mental health. Another example is Gitlen and Czaja's 2015 study that aligns well with the UNICEF Three Star Approach.

Schoonenboom and Johnson (2017) provide a framework that highlights the primary dimensions of a mixed methods case study research namely, (i) purpose; (ii) theoretical drive; (iii) timing; (iv) typological vs. interactive design approach; (v) planned vs. emergent design; and (vi) complexity. The authors detailed each of these dimensions in their article stating that the overall goal of mixed methods research is to combine qualitative and quantitative research to strengthen a study's conclusion that is guided by the research questions. The mixed methods study design assists with the triangulation of the results that are generated through different techniques, while it also helps with the interpretation and clarification of results in complex exploratory settings. Without elaborating about all the aspects of the mixed methods approach described by Schoonenboom & Johnson (2017) in this study, it is important to highlight the timing aspect of the qualitative and quantitative components of the mixed methods approach. Schoonenboom and Johnson (2017) indicate that some designs are sequential by nature where the qualitative data is first obtained, followed by qualitative data that is then subsequently quantified. In this study, qualitative data was collected using various data collection techniques and then analysed using a quantitative measure (Schoonenboom & Johnson, 2017; Creswell & Plano Clark, 2018; Yin, 2018). This mixed methods multiple case study research design allowed for an in-depth exploration of the effectiveness of

environmental health interventions at selected schools. Thus, using multiple sources and perspectives within a real-life context (Bowen et al., 2017; Schoonenboom & Johnson, 2017; Yin, 2018). This study design allows the opportunity to display each school's uniqueness relative to each other.

The refence tool that guided data collection from the different schools (multiple cases) was the UNICEF's Three Star Approach for WASH. This model uses data from multiple sources to establish criteria that rate a school's WASH interventions as a one, two or three stars (UNICEF GIZ, 2013). The Three Star Approach for WASH was applied in the selected schools, assessing the effectiveness of the hygiene interventions by EHPs by focusing on the requisite behaviour change variables suggested by WASH, which included the five key categories: relevance; coherence; efficiency; effectiveness and sustainability, to ensure positive outcomes. While focusing on the hygiene behaviour change, the infrastructure was evaluated through the environmental assessment and sanitation audits. Data collected from the EHPs was used to identify if they followed the prescriptions of the WASH project plan cycle and whether they had use the COMBI tool principles for conducting needs assessments, established objectives and set indicators to measure progress. Furthermore, the research set out to establish how the EHPs implement their projects, and if or how they conduct evaluations to gauge the effectiveness of their interventions.

The data collection was conducted during 2019 at six primary schools across the Cape Metropole area. Ten schools were randomly selected to eliminate bias from the researcher and the EHPs, but only six finally participated. The mixed methods multiple case studies were conducted using data collection techniques such as photographic gestalt, semi-structured interviews, questionnaires, environmental assessment, sanitation audits and observations. The first school that positively responded to the invitation to participate in the study, a quintile 4 school, located in the Maitland area, was used for the pilot study. The pilot study identified minor logistical shortcomings and misinterpretation of questionnaires that provided insight to refine questions. The minor adjustments, such as sentence structure and word use, did not change the results from the original data collection tools of the other five schools that also participated. After capturing the data from the pilot study, this provided accurate insight into the research approach. An overview of the research methodology used is displayed in Figure 3.1, illustrating the design for this study. Figure 3.2, meanwhile, provides an overview of the case study protocol that was employed to achieve the study objectives.
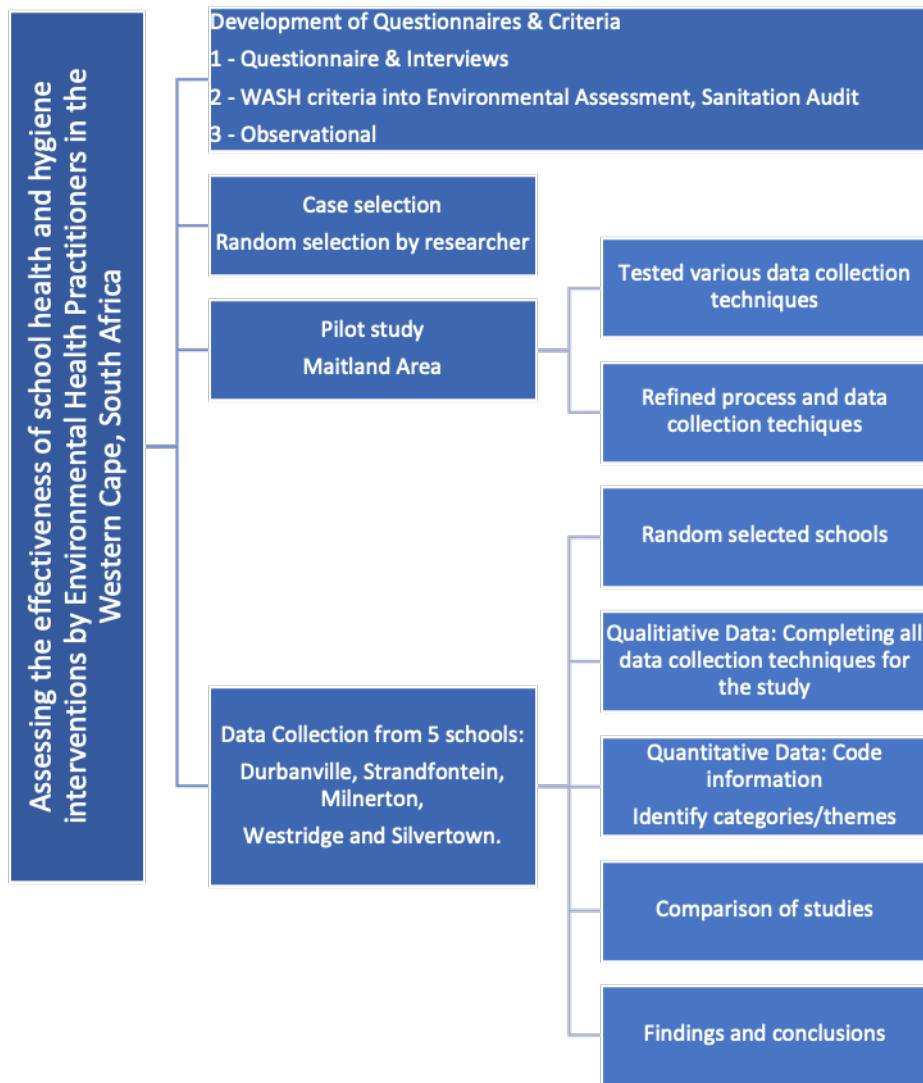
Figure 3. 1: An illustration of the exploratory mixed methods multiple case study design

During the study five techniques were used for collecting the qualitative data. Semi-structured interviews were conducted with an EHP and a school groundsman from each participating school. Three questionnaires were completed with Grade 7 students that consisted of a preliminary questionnaire, a second questionnaire after the intervention, and a third, a month after the intervention. In addition, a questionnaire was completed by the Grade 7 teachers from the various schools, while the Grade 7 students completed their third questionnaire. The photographic gestalt technique was used to collect pictorial data relating to the environmental condition at schools. This consisted of two sets per school, which aided the observations. The interventions of the various EHPs were also observed, which included two environmental assessments per school (one month apart) and two sanitation audits per school (also one

month apart). The process of each phase of data collection and analysis is illustrated in Figure 3.2.
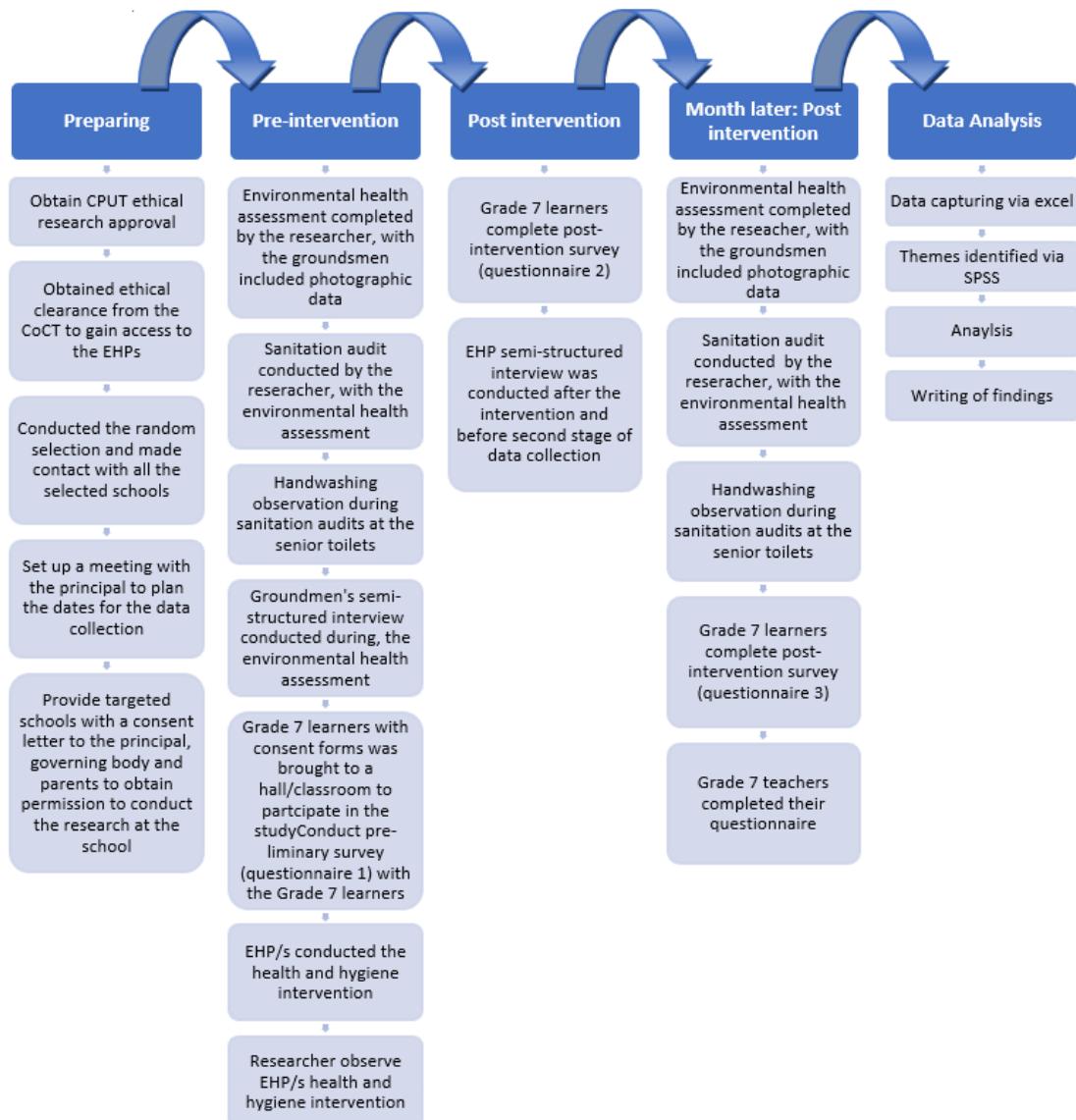
Figure 3. 2: Case study protocol showing the process followed at participating school to achieve the study objectives.

3.2.1. Research setting

The research took place within the Cape Metropolitan area, Western Cape, South Africa. The study area is depicted in Figure 3.3 showing the entire metropolitan sub-district areas of Cape Town. One of the areas, Tygerberg Sub-district (coloured yellow and in the centre of the map) was excluded from the random selection process to mitigate bias as it was the researcher's daily work area.
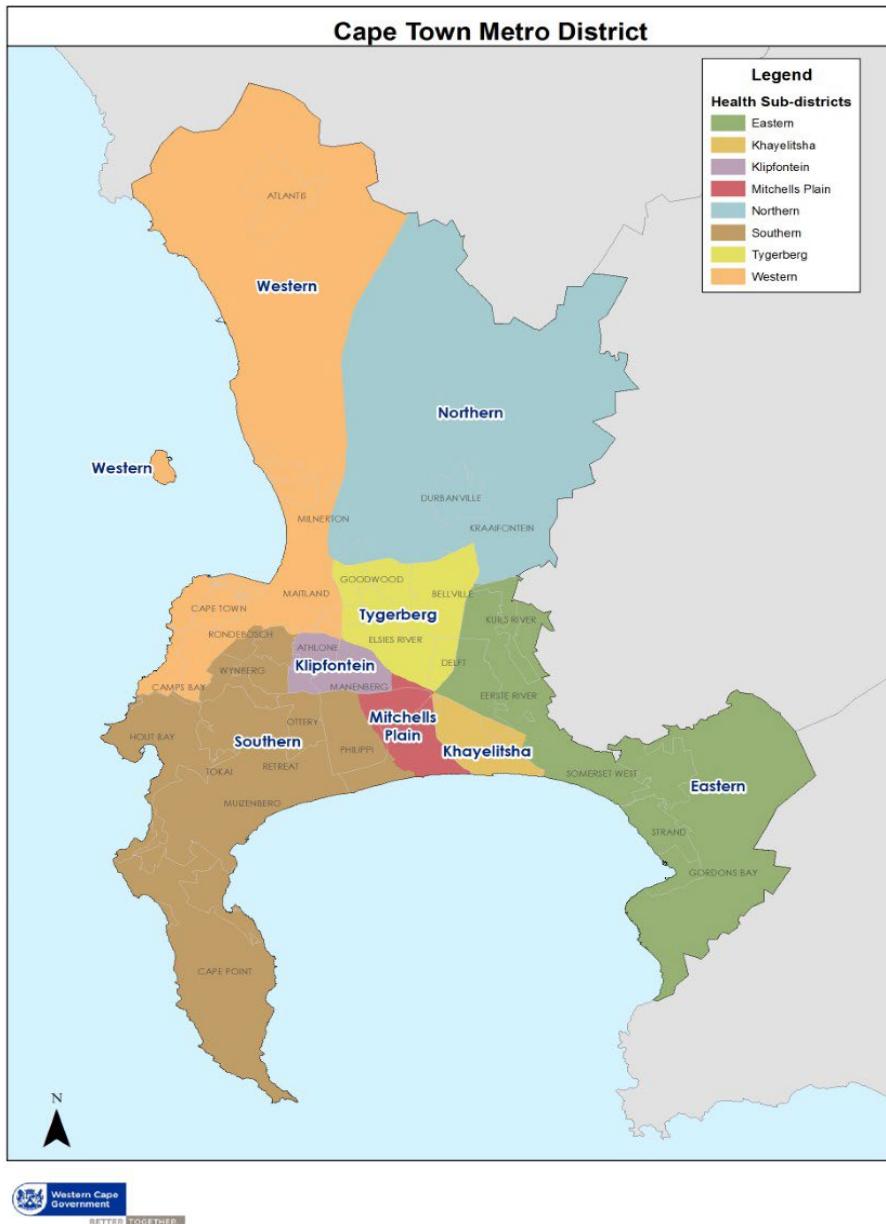
Figure 3. 3: The metropolitan sub-district areas of Cape Town
Source: Western Cape Government, 2020

Although the random selection of ten schools covered all five of the DBE school quintiles (Q), i.e., Q1 (less resourced) to Q5 (better resourced), Table 3.1 shows that only 6 schools participate in the study. The participating schools included quintiles 3 to 5 that covered middle-class schools to more affluent schools. Quintile 1 and 2 schools, representing the poorest schools, were not included in the study, for the simple reason that no responses to the invitation to participate was received. Two of the schools turned down the invitation outright for not having just opened and not having enough students and not teaching Grade 7 level respectively (See Table 3.1).

Table 3. 1: Quintiles and class grades of the various participating primary schools

Quintile	Primary school (number is an alias for the school's name)	Area	Suburb	Rural/ Urban	Participated in study
2	7	Strand	Strand	Urban	Disagreed, only have grade 1-4 students
3	2	Durbanville	Durbanville	Rural	Agreed
4	1 4	Factreton Tijgerhof	Maitland Milnerton	Urban	Agreed
5	3 5 6	Strandfontein Westridge Silvertown	Wynberg Mitchells Plain Klipfontein	Urban	Agreed
Private	8	Pinelands	Pinelands	Urban	Disagreed, too little students, just started the school and not on CAPS system
No response from the schools after 4 contact session, from the top 15 selected after random selection					
1	11	Bloekombos	Kraaifontein	Rural	
3	14	Driftsands	Blue Downs	Rural	
3	10	Nyanga	Nyanga	Rural	
4	9	Delft South	Delft	Rural	Falls within area central (Tygerberg), thus disqualifies the school
5	13	Cape Town	Cape Town	Urban	
5	12	Heathfield	Heathfield	Urban	
5	15	Portland	Mitchells Plain	Urban	

Grade 7 students were targeted for the questionnaires, because they were the highest educational level in the primary school system where EHPs normally conducted their awareness interventions. The data collection from the Grade 7 students was obtained from the various schools by conducting questionnaires one month apart. The remainder of the data collection was finalised using the data collection techniques listed in Table 3.2. This table provides a detailed overview of various participant categories, data collection techniques used and, when and where the data were collected. Where the data techniques were based on the reference tool of the UNICEF Three Star Approach, the Environmental Health Norms & Standards 2015 and the ISHP.

Table 3. 2: Overview of various participant categories and the data collection techniques used to collect the data at different data collection stages

Participants	Data technique	First data collection setting	Second data collection setting
Grade 7 students	3 x questionnaires (Preliminary, Post and Follow)	Participating Grade 7 students were separate from those not participating, in order to complete the two questionnaires. They were required to complete the first questionnaire before the intervention; the second, after they had listened to the intervention. Grade 7 teachers and the researcher was present.	The third questionnaire was completed a month later, without any further interventions, to gauge the knowledge retention after the aforementioned intervention. Due to the exams that were underway, the third questionnaire was completed in class in the presence of the researcher and the teacher.
Grade 7 teachers	Questionnaire	Did not occur during the first data collection stage.	Grade 7 teachers completed the questionnaire in class, while the Grade 7 students were completing their questionnaire.
Groundsmen	Semi-structured interviews	The setting was informal, as it was not situated at a desk where usual interviews take place. Instead, the interviews occurred inside the school premises, during a walkabout.	Extra information was noted during the second round of data collection, which consisted of observations of the school's premises while the groundsman accompanied the researcher.
EHPs	Semi-structured interviews	Occurred after the first data collection, where appointments were made via email, with a time and date. Semi-structured interviews were conducted in a private room – a boardroom or a vacant office – to ensure the EHPs had the freedom to speak their mind.	
	Observation	Observations took place during the first data collection phase, which was also recorded by the researcher. The observation tool (see Appendix 4) is tied into semi-structured interview questions 12 to 17 (see Appendix 3).	Only occurred once
Researcher / Practitioner	Sanitation audit	This occurred during the walkabout with the groundsman to physically see the state of the school premises and take photographs. These walkabouts occurred before the students' first and second questionnaires, with the health and hygiene intervention conducted by the EHP.	This occurred during the walkabout with the groundsman to physically observe the state of the school premises and capture images as part of the photographic gestalt. These walkabouts occurred before the students completed their third questionnaire during the second data collection stage.
	Environmental assessment		
	Photographic gestalt		

All participants were provided with gatekeeper's consent forms (Appendix 2) that had to be signed as part of the ethical requirements, in addition to requesting permission to record and take photographs of the participants. The gatekeepers consent forms were provided and signed before any data collection took place. In the case of the school premises, the principal signed the gatekeeper permission to obtain the needed information and to take photographs for the photographic gestalt.

3.2.2. Pilot study

The pilot study was used to test practical logistics arrangements before approaching the Grade 7 students, teachers and groundsmen at other schools as well as the EHPs involved in outreach programmes. At the same time, the researcher was able to establish the validity and reliability of the research techniques used for data collection, where minor language changes were made. Finally, the pilot study also assisted in the finalising of the data analysis plan and interpretation to ensure that the information produced aligns with the criteria set by the UNICEF Three Star Approach.

During the pilot the four data collection techniques were applied (i.e., questionnaire, semi-structured interviews, observations and note-taking of the sanitation audit and environmental assessment, supported by photographic gestalt), and the minor changes were recorded, which is reflected in the section where each of the techniques are discussed. The changes did not change the data collection techniques but strengthened the data collection process to support data triangulation.

The pilot school was the school that responded first to the request for participation. It fell within the Factreton-Maitland area in Cape Town (Western Cape, South Africa), being a Quintile 4 school. A total of 28 Grade 7 students participated in the pilot study, which formed part of the 6 participating schools, assessed in the data analysis.

3.2.2.1. Questionnaire

Before the EHPs conducted their health and hygiene intervention, the researcher provided the Grade 7 students with a pre-questionnaire (Appendix 5) to create a baseline of their knowledge of hygiene practices. The pre-questionnaire was submitted on the same day as the intervention to the Grade 7 students.

After the EHP conducted their intervention, the second questionnaire was circulated to the Grade 7s to establish the level of knowledge transfer after the EHP's health and hygiene intervention. The Grade 7 students raised a few questions about the second questionnaire (post-intervention) to ensure clarity, all language and sentence structured related.

The following changes were then made to the second questionnaire:

1. The addition of "circle yes or no" for question 5.
2. Changing the layout and order of question 6 to first do the closed question, followed by the open question. Question 8 was split into two questions. The first question ascertained from the learners if they enjoyed the presentation by responding with a yes or no. The second part was a follow-up question where they had to indicate what they enjoyed most about the presentation.
3. Adding the word *diarrhoea* to question 9 for clarity, which then read "name two signs and symptoms of diarrhoea".
4. The "colour or make a cross over the face you want to choose" were added after the question 13: "How important is washing your hands?"
5. Question 18 was rephrased: "The handwashing steps are in the incorrect order; number them 1 to 6 under the pictures so that the numbers follow the correct handwashing steps." Moreover, a description of the pictures was added for clarity. For example, the following phrases were included: "rub & scrub your hands", "dry your hands", "wet your hands", "turn off tap", "soap" and "rinse".
6. The last question was rephrased to read as follows: "Where do you eat at school during break?"

One month later, the follow-up questionnaire was conducted focusing on behavioural questions, to establish the retention of knowledge and possible attitudinal change. The researcher ensured that the same number of Grade 7 students that participated in the previous questionnaires completed the post-questionnaire. Accordingly, a total of three questionnaires were completed by each of the Grade 7 students who participated in the research: the pre-questionnaire, the post-questionnaire and the follow-up questionnaire a month later.

3.2.2.2. Semi-structured interview

Environmental health practitioner

The semi-structured interview (Appendix 3) with the EHP who conducted the pilot intervention was done after the environmental health assessment and sanitation audit were completed,

and before the first questionnaire with the Grade 7 students. Data collection was conducted in a neutral area to create an atmosphere for the respondents, at the school, to be able to be forthcoming and open to answering questions. The questionnaire felt somewhat rushed at the school, between the sanitation audit, environmental assessment, groundsman's interview, and questionnaire. Although only one EHP participated in the pilot, a maximum of five EHPs participated in one school's case study. Consequently, a logistical adjustment was made to schedule appointments with the different EHPs participating in the interventions after the initial intervention. This was to allow sufficient time for each activity.

Qualitative information was obtained from the EHPs' semi-structured interview data, during the data analysis it was noted that nominal coding was required for all the closed-ended questions. Information from the semi-structured interview was transcribed and captured into Altas.ti and used to identify themes that would arise from the open-ended questions. The document was downloaded into a Microsoft Excel document, displaying the theme's obtained from the EHP's questionnaires, linked to answering the studies objective.

The following were added or changed in the questionnaire for EHPs:
1. The options under the highest qualification were coded, from 1 being a national diploma to 5 being a master's qualification. This was done to make it easy to capture the data.
2. "Describe your overall work experience" was added to identify whether EHPs only have experience in government.
3. The options for the question, "Where does your school project PDR target fall?" were changed to incorporate "No PDR" for school projects. Options 60 to 69 and 70 to 79 were removed due to EHP feedback stating that EHPs are not responsible for schools; the Health Promotion Officer is. Health Promotion Officers only assist on an ad hoc basis.
4. Questions 17 to 20, as closed questions, required coding to assist with data capture. "Yes" was denoted with a 1, and "No" with a 2.
5. A question was added to the semi-structured questionnaire, leading from the questions related to conducting, monitoring and evaluating an intervention. The question added was "How do you think you get to change their behaviour/mindsets?" This relates to the topics of the importance of handwashing after using the toilet, which covers the Star 2 requirements of the Three Star Approach to expand hygiene education (UNICEF, 2013).
6. It was decided to record the semi-structured interviews with the various EHPs to authenticate information.

Teachers

Teachers have an influence among school students by contributing to the UNICEF Three Star Approach under Star 1 and Star 2, with the focus being (i) daily supervision of group handwashing with soap before mealtimes, (ii) provision of soap and clean toilets, (iii) access to drinking water, and (iv) hygiene education. As a result, it was deemed essential to design a questionnaire for the Graded 7 teachers to identify compliance or non-compliance with the UNICEF Three Star Approach (UNICEF, GIZ, 2013).

The teacher's questionnaire (Appendix 7) was given to the Grade 7 teachers, while Grade 7 students completed their follow-up questionnaire a month after the intervention. Although the questionnaire was optional for the Grade 7 teachers, 100% (two Grade 7 teachers per school) completed the questionnaire. The questionnaire consisted of 11 questions, with a focus on the safety aspect of the school, social issues, handwashing practices and supervisions and the state of the toilets.

Groundsmen

A semi-structured interview (Appendix 6) was developed for the school groundsmen due to the requirements of the UNICEF Three Star Approach. This approach focuses on (i) water, (ii) sanitation, and (iii) hygiene facilities with regular hygiene awareness programmes, where other factors include (iv) infrastructure, (v) water, (vi) sanitation systems, and (vii) the overall maintenance of facilities. Consequently, a semi-structured interview was included for the groundsman responsible for the upkeep and maintenance of the school (UNICEF, 2013). After the pilot study was completed, there was a need to include the number of staff who are responsible for the upkeep and hygiene of the school, also distinguishing the gender of the groundsman. As a groundsman can be both male or female.

The groundsmen questionnaire focused on the general maintenance, their opinions of the state of the toilets and the cleaning scheduled, with possible challenges they experience within the school.

3.2.2.3. Observations

Environmental health practitioner

Incidental observations of the health and hygiene intervention was made during the pilot study of the EHP/s. A video recording was taken during the intervention, with noted observations by the researcher. The observation sheet was designed for the research (see Appendix 4), to ensure consistent observation took place during each health and hygiene intervention. The EHPs' observational tool ensured that the topic of handwashing and its importance was covered according to the needs of the UNICEF Three Star Approach. It was specifically looking at Star 2, which includes the "hygiene education and facilities to promote handwashing with soap after toilet use" (UNICEF GIZ, 2013). Overall, there were no logistical or clarity issues to be made.

Sanitation audit

While conducting the sanitation audit during the pilot, it was observed that there were supervision roles at the toilets, certain toilet had doors and others didn't. The observations during the sanitation audit also covers the handwashing practices after visiting the toilets. The incidental observations of handwashing practices took place during the school's break time, with observations of supervision in toilets during this time. The isolated handwashing experiment for the Grade 7 students could not be conducted due to the routine and time constraints of the school.

The following questions were added to the sanitation audit to ensure comprehensive data collection:
1. The supervision of students in toilets.
2. Do all the toilets have doors? This question relates to students' privacy and is a requirement of the DoH's norms and standards (South Africa: Department of Health, 2015).
3. Scheduling of the cleaning of toilets.

The above questions are important as it relates to the UNICEF Three Star Approach, where star 3 speaks to the country's national standard.

3.2.2.4. Environmental assessment

The environmental assessment and sanitation audit took place simultaneously while doing the walkabout with the groundsman before the intervention with the Grade 7 students. Photographs were taken on the day during the assessment while being accompanied by the groundsman, who assisted with responses to the assessment. Photographs were taken of the waste area, the surrounding environment of the school, the alternative water supply and the kitchen used for the school's feeding scheme.

The following considerations were added to the environmental assessment:
1. Specific sub-item requirements from the Environmental Health Norms and Standards (2015) were added to each main item. This was to ensure that the researcher doesn't miss or forget all the observations related to Star 3, as it stated each school ought to meet the national standards of their country according to UNICEF Three Star Approach (UNICEF, GIZ, 2013).
2. In the pilot study school, the teachers used one of the out of order toilet areas as their smoking room.

The environmental health assessment took place again one month later, when all the necessary changes had been made. This was done in order to influence the data collected; however, due to the amount of data being collected on one day, the researcher provided the additional information to ensure nothing was left out or forgotten.

3.2.2.5. Photographic gestalt

The environmental condition of the school's premises and the surrounding area was captured and analysed, looking at conditions that may be contributing to diarrhoea and unhygienic conditions. The handwashing basins and toilets at the ablution facility were photographed to determine if the necessary facilities are in place and if they are used for the practice of handwashing. Photos were taken (i) on the day of the intervention, and (ii) one month later, before the follow-up questionnaire was distributed.

3.2.3. Challenges

The following were deemed to be challenges during the pilot study:

- Obtaining three sessions for the questionnaires due to the time constraints of the school programme. This was reduced to two sessions, which still achieved the set-out research objectives.
- Working around during the school's normal daily programme and ensuring adequate time to conduct the sanitation audit and environmental assessment.
- Confirming the availability of the EHP involved on the day and not having prior approval of who would attend to conduct the intervention.
- During the data capturing, it was challenging to decipher some of the answers from the Grade 7 questionnaires due to sentence construction and poor spelling by some respondents.

The above challenges were addressed through condensing the sessions from three to two session, where adequate planning and communication took place a month prior to data collection with all the participants.

3.3. Location and participants

The Grade 7 students who participated in the pilot were aged between 12 and 16 years. Before the questionnaire was distributed, the Grade 7 teachers indicated that there were four students with reading difficulties. During the capturing of the data, the teachers' comment was evident owing to the sentence structure and incorrect spelling in the answers by these students. However, all the questionnaires were anonymous to ensure no bias or alteration of the data occurred as a result of this prior knowledge.

A total of 15 EHPs were involved in the study, with Table 3.3 displaying the number of EHPs per school who participate in the intervention.

Table 3. 3: Distribution of EHPs participating in the study at the various schools

School	Quintile	EHPs
1	4	1
2	3	2
3	5	2
4	4	2
5	5	5
6	5	3
Total		15

The head groundsman assisted with the sanitation audit and the environmental assessment, with the latter being completed an hour before the first and post-intervention questionnaire. Allowing the researcher, the opportunity of compiling the photographic gestalt of the school premises and specifically the ablution facility. Where the groundsman did not have sufficient information, the principal added additional detail to the environmental assessment of the school.

3.3.1. School selection

Schools were randomly selected in Microsoft Excel using the following method: through adding a new column in the spreadsheet and name it a random number. Thereafter inserting in the first cell underneath the heading row, type "= RAND()", press "Enter" and a random number appeared in the cell; copy and paste the first cell into the other cells in this column opposite each school.

The top 10 schools were selected within the Cape Metropolitan area. The Area Central: Tygerberg area was excluded from the study to prevent research bias. Emails were sent to all the schools selected and were telephoned later to ascertain if they received the emails and confirm email addresses for those who did not respond by the planned cut-off date. Consequently, the first school that replied and provided the gatekeeper form (Appendix 2) signed by the principal was used for the pilot study.

During the first face-to-face encounter with the principal during the pilot study it was evident that the originally stated three encounters for data collection would not be feasible for the school quarterly operational programme, due to the test and exam period. As a term constituted of three to four months in length. Consequently, a change was made to two encounters for data collection, which had no impact on the data and achieving the study objectives.

With the routine and time constraints of the school, the isolated handwashing experiment posed a challenging exercise with the Grade 7 students. Consequently, the researcher ensured that the observations of the children's handwashing practices coincided with the environmental assessment and the sanitation audit. A semi-structured interview was conducted with groundsmen during the walkabout through schools' premises. After the original discussion with the first principal, the semi-structured questionnaire for the groundsmen was added as they are responsible for the upkeep of the school premises. During the pilot study, the groundsman at the school stated: "I am responsible for the safety and hygiene of the

children." Therefore, the function of the groundsman informed Star 1 and Star 3 of the UNICEF Three Star Approach requirements. The groundsman tasks cover the daily supervision of cleaning and functioning of toilets, and addressing issues related to the responsibility for the maintenance and repair of facilities. Star 1 informed the daily supervision of handwashing, which related to teachers' break duty. To cover this, a questionnaire was designed for and completed by teachers during the second encounter with the Grade 7 students (UNICEF, GIZ, 2013).

3.4. Research instruments

The four data collection techniques that were employed during the pilot and the remainder of the case studies included the following:

- Questionnaire
- Semi-structured interviews
- Observations and note-taking
    - o Sanitation audit
    - o Environmental Assessment
- Photographic gestalt

The Grade 7 learner's questionnaires and EHP/s health and hygiene intervention took place during the Life Orientation class period; 164 students participated from six different schools in the Cape Metropole area (Cape Town, South Africa). The principal's and parents' written consent to participate in the intervention were sought before the intervention, participation, and questionnaires. A consent form (Appendix 2) was created for the Grade 7 students. The EHPs, the teachers and the groundsmen signed a different consent form in order for information of the research, recordings of the interventions and to take photographs during the intervention process.

The engagement of the Grade 7 students consisted of two sessions of approximately 45 minutes each; the first session included an awareness session conducted by the EHPs within the various areas and the completion of questionnaires (Appendix 5). The second session occurred one month after the intervention. To prevent the bias of authority influence, the completion of questionnaires was facilitated by the researcher and not the teacher; however, the teacher was present during both data collection sessions (see Appendix 5). On both accounts, the environmental health assessment and the sanitation audit took place during the intervention session (see Appendices 8 and 9).

A total of six schools out of ten schools were completed, as indicated in Chapter 1, which included the pilot school. The first intervention took place between September and October 2019, with the second intervention one month later, between October and November 2019 (see Table 3.4).

Table 3. 4: Timeline for interventions at schools

School	Suburb	First session 2019	Second session 2019
School 1 (Pilot)	Factreton	10 Sep	08 Oct
School 2	Durbanville	12 Sep	10 Oct
School 3	Strandfontein	17 Sep	15 Oct
School 4	Milnerton	11 Oct	08 Nov
School 5	Westridge	08 Oct	04 Nov
School 6	Silvertown	14 Oct	15 Nov
School 7	Goodwood	Declined; too few students, just started the school and not on the CAPS system	
School 8	Strand	Declined only have Grade 1–4 students	

As reflected above, two of the eight schools declined the study due to having too few students (school 7), while school 8's highest grade was Grade 4. Schools 9 fell within the area central, which was disqualified due to bias and school 10 failed to respond and phone numbers did not work. The next 5 schools in the top 10 random selection were emailed, to obtain the 10 school as indicated in chapter 1, however no reply was obtained. The final number of schools where the interventions took place was six, as indicated in Table 3.4. With no bias of excluding Quintile 1 and 2.

Table 3.5 shows the various data collection techniques that were used during the comparative case study procedure.

Table 3. 5: Data collection techniques and participants

Schools	Data collection techniques	Participants
1	Questionnaires	Grade 7 students Grade 7 teachers
2	Semi-structured interviews	EHPs Groundsmen
3	Photographic gestalt	All schools Researcher, accompanied by the groundsmen

4	Observations	EHPs' intervention Researcher Grade 7 students Groundsmen
5	Sanitation audit	Researcher Groundsmen
6	Environmental assessment	Researcher Groundmen

3.5. Data collection techniques

The Grade 7 students (Appendix 5) and teachers (Appendix 7) completed their questionnaires. The Grade 7 students completed three questionnaires during the study, whereas the teachers completed only one. Two different groups of participants completed the semi-structured interviews, namely the EHPs (Appendix 3) and the groundsmen (Appendix 6). The interaction with the EHPs took place after the data collection was concluded at the schools. The groundsmen's semi-structured interviews took place during the data collection at the schools. Observations were based on the environmental assessment (Appendix 8), sanitation audit (Appendix 9) and interventions conducted by the EHPs. Photographic gestalt photographs were captured during data collection at schools.

3.5.1. Questionnaires: Students

There was a total of three different questionnaires for the Grade 7 students, which they completed at different stages: (i) a pre-intervention questionnaire (Appendix 5), (ii) a post-questionnaire after the intervention (Appendix 5), and (iii) a follow-up questionnaire one month after the intervention (Appendix 5) had taken place. All the questionnaires were provided in English, as all participating schools' primary language was English.

The pre-intervention questions identified if EHPs had previously been at the school and whether the Grade 7 students retained information of that intervention. The questionnaire after the intervention confirmed if a transfer of knowledge was achieved regarding the topic presented by the EHP. A follow-up questionnaire one month later was conducted to see if the information was intrinsically stored and if students had been implementing what they learnt during the EHPs' intervention. The focus was on behavioural questions and the retention of information. During the completion of the questionnaires, both the teacher and researcher were present; the researcher led the session of answering questions throughout the case study.

The Grade 7 students completed a total of three questionnaires, all of which included questions on demographics and hygiene. There was no time limit for the questionnaires to be finished; each questionnaire was collected when the Grade 7 learner was done. Questionnaire 1 consisted of 10 questions, specifically providing a baseline of handwashing knowledge. Questionnaire 2 consisted of 21 questions to establish if knowledge was transferred during the interventions. Questionnaire 3 consisted of 15 questions focusing on the retention of information shared during the intervention, seeking to ascertain if behavioural change occurred through a scenario of multiple-choice questions. All the questionnaires included closed, open-ended and multiple-choice questions, thus obtaining qualitative data during the data collection.

3.5.2. Questionnaire: Teachers

As part of the Star 1 objective, which included the daily supervision of handwashing, a questionnaire was developed for teachers (Appendix 7) to understand their role and the challenges they faced in implementing proper hygiene standards at their school. This questionnaire was administered during the second encounter with the Grade 7 students.

The teachers' questionnaire focused on the condition of the sanitation area. Similarly, the questionnaires completed by the Grade 7 students and the groundsmen also provided insights into the school's sanitation state. This approach allowed for the verification and comparison of data collected for the sanitation audit. The questionnaire comprised 11 items, including closed and open-ended questions, and required approximately one hour to complete (see Appendix 7).

3.5.3. Semi-structured interviews: Environmental Health Practitioners

Fifteen EHPs participated in the semi-structured interviews (Appendix 3). As part of their official duties, EHPs conduct health and hygiene intervention within their respective geographical areas of jurisdiction. They in turn conducted the case study intervention at the selected schools within their respective jurisdictions (i.e., sub-districts). Health and hygiene interventions, where group participation occurred in five of the schools, EHPs assisted each other. This group work was evident in the research study, with 15 EHPs involved in the six schools.

The semi-structured interviews captured the EHPs experience and qualifications in addition to questions related to the effectiveness of the intervention. This session identified the

methodology an EHP used to identify specific health and hygiene topics, and how these topics were presented. Lastly the questionnaire included questions regarding the absence or presence of adequate evaluation and monitoring tools, such as the COMBI tool to assess the effectiveness of the education after the intervention had been conducted. The questions also covered issues relating to the relevant legislation that guides the EHPs in knowing what they should implement when they conduct their health and hygiene interventions at schools.

The researcher conducted the EHPs' semi-structured interviews in privacy, and were audio-recorded with their permission. This semi-structured questionnaire was completed before the second school visit and consisted of 24 questions. It sought to first obtain demographic information, followed by questions directly relating to the study's objectives, such as what informs the EHP when selecting a particular school during the course of their work. Secondly, how the EHP goes about conducting their interviews. Most of the questions were open-ended to ensure adequate information was obtained. This was in order to understand the process and fully understand the health and hygiene interventions of the environmental health practitioners (see Appendix 3).

3.5.4. Semi-structured interviews: Groundsmen

After the first meeting with the principal of the pilot school, it was evident that groundsmen play a crucial role in maintaining the school environment, including the sanitation facilities. A semi-structured interview was designed and completed during the environmental assessment of the schools' grounds and the sanitation audit. The groundsmen showed a relaxed nature during the semi-structured interview – while on the walkabout. The researcher confirmed that after the pilot, additional information was revealed during the walkabout.

Initially, the semi-structured interviews started in a formal setting. It was observed that the interviewing atmosphere was tense because of the feeling that the respondent was "put on the spot". Bearing this in mind, the strategy was changed after the pilot to collect data from groundsmen while the walkabout was taking place. This generated more information from the groundsmen, as the entire school's premises was in fact their office.

The semi-structured interview only took place once, with the first environmental assessment and the sanitation audit and was not repeated when the researcher returned one month later.

The semi-structured interview consisted of seven questions (Appendix 6), all of them of an open-ended nature to obtain rich information. The questions were directed at the monitoring

and evaluation objective of the study. These sessions were conducted alongside the sanitation audit and the environmental assessment during the walkabout.

3.5.5. Researcher observations

The environmental assessment (Appendix 8) and sanitation audit (Appendix 9) requirements were based on the UNICEF Three Star Approach, with the ISHP and Environmental Health Norms and Standards providing the countries standard and policies. The observations focused on the hygienic conditions of school grounds and the environment around the school. For the hygiene and cleanliness of the sanitation facility, the availability of handwashing soap and paper (or cloth) towels in bathrooms was investigated, and if children do in fact make use of the soap and towels.

According to the norms and standards and the ISHP, the schools' EHPs should conduct compliance inspections at the various schools to provide a Health Certificate. These compliance inspections by EHPs are a crucial component of the UNICEF Three Star Approach, as this is what provides a school with a Three Star rating – that it complies with the national standards for South Africa. Additional observations were conducted during the EHPs interventions using an observation tool (Appendix 4) and the intervention was video-recorded, with their permission.

Observations were made of handwashing practices during the sanitation audit. Both assessments were conducted twice, with the initial intervention of the EHPs and one month later. During data analysis, the information was used to identify any conditional change, whether it had improved, or if conditions remained the same. This assessment was conducted using the photographic gestalt technique.

3.5.6. Photographic gestalt

The environmental condition of the school premises and the surrounding area was captured with digital photographs while the environmental assessment and sanitation audits were being conducted. The capturing of each school's environment focused on conditions that could contribute to diarrhoea and unhygienic conditions. The ablution facility's handwashing basins and toilets were photographed to observe if the necessary facilities were in place and being used for the practice of handwashing.

Care was taken when using the photographic gestalt technique to take photographs from positions that could ensure the comparison of similar conditions. Table 3.6 shows the dates and times when the researcher conducted the research.

Table 3. 6: School data collection schedule

School	Suburb	First session	Audit/ Sanitation	Q1 – intervention - Q2			Second session	Audit/ Sanitation	Q3
School 1	Factreton	10-Sep-19	09:00	10:20 11:20	10:40 11:40	11:00 12:00	08-Oct-19	09:00	10:20 11:20
School 2	Westridge	12-Sep-19	10:00	11:30	11:50	12:10	10-Oct-19	10:00	11:30
School 3	Strandfontein	17-Sep-19	09:00	10:30	10:50	12:10	15-Oct-19	09:00	10:30
School 4	Milnerton	11-Oct-19	09:00	10:30	10:50	12:10	08-Nov-19	09:00	10:30
School 5	Durbanville	08-Oct-19	11:00	12:40	13:00	13:20	04-Nov-19	11:00	12:40
School 6	Silvertown	14-Oct-19	08:00	09:00	09:30	10:00	15-Nov-19	10:00	11:30

3.6 Data analysis

A sample of 164 Grade 7 students participated in the study, drawn from a total population of 527 students across the ten schools selected for this mixed-methods, multiple-case study research. Based on this sampling group, the confidence level was 95%, resulting in a confidence interval of 6.36. This defined the acceptable margin of error for the quantitative analysis phase.

Three rounds of data collection, using the student questionnaires, were conducted at different stages of the intervention: before, during, and after implementation. These questionnaires included closed ended (quantitative) and open-ended (qualitative) questions. The researcher captured and analysed the quantitative responses using Microsoft Excel. They entered each dataset twice and cross-checked it using the 'IF & TRUE' function to ensure accuracy and consistency.

For the qualitative component, responses to open-ended questions were manually coded and thematically analysed to identify common trends and emerging patterns across the three rounds. The repeated measures from the students allowed for comparison over time, capturing changes in hygiene awareness, behaviour, and perceptions.

In addition to the student questionnaires, the researcher conducted interviews with Environmental Health Practitioners (EHPs). An independent external transcriber transcribed these interviews to minimise potential bias during qualitative analysis.

Numbering
- All data collected was numbered, example: school 1
- Excel tab was created for each questionnaire & groundsmen semi-structured interview
- Excel tab was created for observations (i.e. environmental assessment and sanitation audit)

Capturing
- EHP semi-structured interview was transcribed
- Questionnaires was all captured in excel
- Semi-structured groundsmen interviews was captured in excel
- Observations was captured into excel

Themes
- EHPs transcribe data uploaded into Atlas.ti to identify themes
- Each question was uploaded to identify similarities and themes
- Observations was uploaded to identify similarities and themes

Figure 3. 4: Data analysis process from coding to theme identification

Table 3.7 divided the participants and the observational methods under each star within the UNICEF Three Star Approach, through the identified themes from the various data collected. Data was used to establish if the criteria of the various stars was met.

Table 3. 7: UNICEF Three Star Approach and participants

Stars	Criteria to be met	Group being assessed for the compliance of the star
One	Daily group-supervised handwashing sessions before meals with all children	- Teachers - Groundsmen - Grade 7 students
	Gender-functional, clean toilets for all children (no open defecation)	- Sanitation audit - Groundsmen - Photographic gestalt
	Access to clean drinking water (bottles)	- Groundsmen - Environmental assessment - Sanitation audit - Grade 7 students - Grade 7 teachers
Two	Handwashing after toilet use, with soap and water	- Teachers - Groundsmen - Grade 7 students

	Improve available sanitation and menstrual hygiene facilities	• Groundsmen • Sanitation audit • Photographic gestalt
	Availability of drinking water at school	• Groundsmen • Environmental assessment • Sanitation audit • Grade 7 students • Grade 7 teachers
Three	National standards of countries to be met by upgrading school facilities and systems	• EHPs • Groundsmen

Accordingly, Table 3.8 provides an overview of how the Three Stars (UNICEF, GIZ, 2013) support the four research objectives and which data collection sources provide the supporting data for the requisite comparison and analysis with the EHPs' interview data.

Table 3. 8: Associated research instruments used to inform the objectives of the study

Objective	Objective description	Star	Comparison group to EHPs data
1	To determine how EHPs are informed to conduct a health and hygiene intervention at their school.	1, 2, 3	• Grade 7 learner questionnaires (Appendix 5, 6, 7) • Environmental assessment (Appendix 10) • Sanitation audit (Appendix 11)
2	To determine how EHPs conduct their school's hygiene interventions.	2	• Grade 7 learner questionnaires (Appendix 5, 6, 7) • Sanitation audit Appendix 11) • Environmental assessment (Appendix 10)
3	To establish if the EHPs' monitoring and evaluation methods are effective.	3	• Sanitation audit (Appendix 11) • Environmental assessment (Appendix 10) • Groundsmen (Appendix 8) • Photographic gestalt
4	To determine how effective the EHPs' interventions are.	1,2,3	• Grade 7 students (Appendix 5, 6, 7) • Teachers (Appendix 9)

The data analysis employed a mixed-methods approach, primarily drawing on qualitative data from the questionnaire responses. The researcher systematically analysed the responses about the research instruments used to inform the objectives, comparing them against the established criteria of the Three Star Approach and the Integrated School Health Policy. The researcher linked questionnaire answers to these pre-defined criteria to meet the study's objectives. Tables 3.7 and 3.8 visually represent this process, illustrating how raw data aligned with criteria and contributed to objective fulfilment.

While the core data were qualitative, the researcher introduced some quantification to address specific criteria and objectives. This process involved categorising and counting specific responses, enabling the researcher to identify and quantify trends and patterns within the qualitative data. This hybrid approach balanced the depth of qualitative insights with the clarity of quantitative summaries, providing a comprehensive understanding of the research findings.

3.7. Rigour

Cypress (2017) emphasises that rigour is intertwined in the entire qualitative research process, from planning, data collection, analysis, and interpretation to navigating researcher bias and ensuring validity and reliability. Rigorous research is all about reliability and validity; thus, rigour in research is crucial (Morse, 1999, cited in Cypress, 2017: 256). Subsequently, the researcher manages the rigour throughout the study as the main instrument and primary means of data collection.

Unfortunately, there is no straightforward recipe for managing rigour in qualitative research, like in quantitative research, where there are specific technical criteria (Johnson et al., 2020). However, various authors caution against using strict universal criteria in qualitative research because strict specific criteria may suppress the diversity and multiplicity of qualitative research practices (Cypress, 2017; Johnson et al., 2020). Johnson and her team indicated that various authors instead proposed best practice guidelines to facilitate rigour and research quality in qualitative research. While the suggested best practice "stepwise approach" covers the entire research process, Johnson and team argue that the process involved in developing a well-defined and precise research question and subsequent conceptual framework forms the basis for research rigour. The first step in the best practice guidelines involves the research topic. In contrast, the second step involves the study design, where the conceptual framework enables the selection of the appropriate study methods. Johnson et al. (2020) argue that the alignment between the framework and the methods minimises any intrinsic bias in qualitative research. Step three, which supports research rigour, involves data analysis, where concurrent data collection and analysis facilitate data triangulation.

Triangulation helps to compare different data sources, e.g., observations and interviews, to confirm or contradict the explanations, statements, themes, and study conclusions in line with the study purpose and research question (Johnson et al., 2020). Data saturation, triangulation, and researcher reflectivity are essential for managing research bias and optimising data collection and analysis accuracy. Lincoln and Guba (2011, cited in Johnson et al., 2020: 141) define credibility, transferability, repeatability, and confirmability as criteria to enhance the

trustworthiness in qualitative research. The study's trustworthiness also hinges on the researcher's reflectivity, from setting the research objectives, planning the research, collecting, analysing, interpreting, and reporting on the data. Consequently, the researcher's reflectivity increases the study's credibility and confirmability by reflecting on the accuracy of the data captured.

Steps 4 and 5 refer to valid conclusions and reporting the research results. Ensuring rigour in the conclusion depends on the rigour followed during the previous steps. Johnson and colleagues underline the importance that the conclusion should close the loop by integrating the study results and analysis with the original conceptual framework and objectives. Johnson et al. (2022) further stated that in step 5, quality reporting requires clarity, organisation, completeness, accuracy, and conciseness. To achieve Johnson's statement, they propose using the standards of O'Brien, Harris, Beckman, Reed, Cook and colleagues' (2014) standards for reporting qualitative research (SRQR) to improve transparency in all aspects of qualitative research. Although there are many debates about standards for methodological rigour in qualitative research, as stated above about strict criteria, O'Brien et al. (2014) argue that there is widespread agreement for clear and complete reporting. O'Brien and colleagues subsequently compiled 21 items with guidelines in their SRQR to support extensive and transparent qualitative research reporting, drawing on a rigorous synthesis of recommendations and concepts from existing research and published sources. The 21 items, as summarised in Table 1 of O'Brien's (2014: 1247-8) article, follow the layout of the main components of a thesis, i.e., title, abstract, introduction, methods, results/findings, discussion, and other considerations.

In summary, O'Brien and colleagues (2014:1246) state that qualitative research reporting in the title, abstract, and introductory sections follows the same conventions as quantitative research. However, reporting results in qualitative studies tends to be narrative rather than numerical. They further note that authors in qualitative research seldom present empirically testable hypotheses, as is common in quantitative studies.

Qualitative researchers typically use research questions, theoretical frameworks, or conceptual assumptions to guide their analysis of textual data, rather than relying on formal hypotheses. Researchers must explicitly justify all methodological decisions in qualitative studies using conceptual and logical reasoning, as required by the criteria for reporting research design and methods. A clear description of the methods allows the researcher to make their assumptions and decisions transparent and verifiable to the reader.

Furthermore, qualitative reporting standards require researchers to state the techniques they use, regardless of how familiar they may be, they should explain how they implement them

within the study's specific context. To enhance trustworthiness, O'Brien et al. (2014) recommend that researchers also reflect on their positionality and report on how their perspectives may have influenced data collection and interpretation.

The results section should identify the main contextualised analytical findings. The authors argue that each study's nuanced qualitative approach and methodology inform the results, which should allow a degree of freedom not to follow rigid rules. As stated above, the authors caution researchers against applying rigid rules to reporting qualitative results, even though such rules are appropriate for reporting quantitative research findings. However, in any scientific research, evidence is required to substantiate all analytical findings; therefore, the openness of the researcher's reflectivity in data analysis is important. O'Brien et al. (2014: 1246-7) clarify that the discussion section aligns the "literature and/or the conceptual framework, the scope and boundaries of the results, and the study limitations", which also informs the transferability of the study.

To ensure scientific rigour in this study, the researcher took complete control of managing and supervising each process while personally conducting the interviews, observations, and surveys to ensure consistency. This approach excluded the possibility of data collection bias or inconsistency, often associated with data collection assistants. To mitigate the researcher's bias, during the planning phase, the Tygerberg sub-district (Figure 3.3) that embraced the researcher's normal daily work jurisdiction was excluded from the study.

Before data capturing, each school was numbered from one to six, with each participant coded to ensure anonymity. All participants and observational comments per school were kept in a folder to prevent data misrepresentation and possible misinterpretation. The researcher captured all data in MS Excel and coded it using Atlas.ti 8 to establish the various clustered themes. To ensure rigour during data analysis, the researcher triangulated the photographic gestalt findings with the sanitation and environmental assessments and the questionnaire responses from Grade 7 students, teachers, groundsmen, and EHPs.

Although the study was primarily qualitative, it incorporated quantitative elements by categorising and counting response instances. The researcher aligned this integration with the study's objectives and guided it using predefined criteria. Tables 3.7 and 3.8 present this analytical process, showing how the researcher organised and interpreted the raw data.
The researcher analysed the qualitative data systematically using established frameworks, namely, the Three Star Approach and the Integrated School Health Policy. This method enabled structured comparison across cases and ensured consistency in the analysis.

The study followed a recognised mixed-methods triangulation approach by linking questionnaire responses to policy and framework-based criteria, as supported in relevant literature. This approach strengthened the coherence and internal validity of the findings.

Grade 7 students completed the questionnaires under the researcher's and teacher's supervision to ensure data collection consistency. The same group of students, those who had submitted consent forms (Appendix 2), participated in all three rounds of data collection (pre-, during, and post-intervention).

To standardise the sanitation and environmental observations, the researcher used a reference tool based on the Three Star WASH Approach, incorporating all required assessment aspects. The same groundsmen and Grade 7 students participated in the initial and follow-up observations and interviews, allowing for consistent behavioural comparisons.

The methodology section outlines all steps followed to support the study's dependability. The study addresses validity, reliability, and trustworthiness by transparently describing the research design and the researcher's critical reflection, as suggested by O'Brien et al. (2014). The researcher recorded all semi-structured interviews with Grade 7 students, teachers, groundsmen, and EHPs using MS Excel and Atlas.ti 8, supplemented by written notes. An independent transcriber, uninvolved in the study, transcribed the recordings to maintain objectivity. The use of digital tools and structured analysis techniques contributed to the overall reliability and rigour of the data interpretation process.

3.8. Limitations

The research only considered the interventions of EHPs. It did not include other stakeholders (i.e., other sectoral departments responsible for water and sanitation, social development, and various NGOs), who are also involved in various health programmes.

The above limitation highlights that the researcher could have included the Health Promotion Officer (HPO). The researcher could have conducted a semi-structured interview with the HPO to identify and understand their function and role in supporting the EHPs. Such insight could enlighten the understanding, communication, and relationship between the EHP and the HPO.

Considering the academic year and the study's structure, this resulted in two scheduled research days instead of the three scheduled as per the proposal. The change was due to the logistical challenges relating to schools' academic programmes, as the third day of data

collection would fall during the test period. Subsequently, the researcher amended the study to have two days for data collection instead of three. However, to circumvent the challenges, a change in the programme from separate days for conducting the initial environmental and school observations, the first questionnaire interviews with Grade 7 students, the EHPs' awareness interventions, and the post-intervention interviews was conducted all on the first data collection day. As a result, the researcher conducted the overall final observation and interviews with Grade 7 students a month later to ascertain if any behaviour changes occurred.

The study covered only Quintile 3 to 5 schools. Two schools could not participate because these schools took students only as far as Grade 4 (Table 3.1). In addition, the study did not include Quintile 1 or 2 schools because they never responded to participate. These categories of schools fall within the lowest socio-economic status groups, where there is usually a lack of resources. The researcher experienced difficulties contacting Quintile 1 to 3 schools due to poor communication infrastructure, such as non-functional computers and telephones. Schools 9 and 10 were from Quintile 1 and 3, with emails and contacts that were not operational. Therefore, the researcher excluded these two schools from the survey (Table 3.1). School 8, located in the Strand area, was also excluded because it only offered up to Grade 4. Consequently, the study did not include any schools from the eastern region of the Cape Metropole (see Table 3.1).

3.9. Ethics

Bhandari (2021) argues that ethical considerations is a form of a code of conduct, a guide for the research design and practices. Subsequently, the research institutions should approve the research design to ensure sufficient coverage of ethical issues before conducting interviews. Therefore, the researcher followed the CPUT's code of ethics to research human participants. Jackson-Hollis (2019) and other authors emphasise the importance of a contextualised and practical application of ethical considerations involving children in qualitative research. Various authors (Beazley et al., 2011; Lundy & McEvoy, 2011, cited in Jackson-Hollis, 2019: 149) underline the right of children to express their own opinions, views, emotions and wants in all matters affecting them. Their views have to be seen to be considered and taken seriously. However, Powell et al. (2016, cited in Jackson-Hollis, 2019) argue that there might be tension between children's rights and their vulnerability as research objects.

Nonetheless, Graham et al. (2015, cited in Jackson-Hollis, 2019) said that vulnerability should not prevent children's participation in research but rather inform the approach to optimise their contribution. As a benchmark, Alderson and Morrow (2011, cited in Jackson-Hollis, 2019)

confirm that children's research contribution as participants is well established. Subsequently, Jackson-Hollis (2019:196) suggested overcoming children's participation and consent challenges by getting parental consent first for their young children to participate in the study while allowing the child to assent or dissent to participate. Jackson's article highlights four fundamental principles that underpin informed consent: (i) the child gives explicit, confirmatory agreement to participate; (ii) give the child progressive information about participation that recognises their evolving capacities to internalise the research expectations and implications; (iii) inform the child that participation is voluntary; and (iv) participation is renegotiable. Jackson-Hollis also stresses the importance of assuring the child's confidentiality. Although the Grade 7 students in this study were older than the children in the Jackson-Hollis study, the principles learned from Jackson's study provided valuable guidance to protect the children's rights in this study.

The CPUT's ethical code emphasises the researcher's role to protect the participants' physical, social, and psychological wellness while respecting their dignity and privacy. Therefore, the ethical consideration during this study was to ensure that all the rights of the willing participants, that signed a gatekeeper's (consent) form (Appendix 2) after they were briefed about the purpose of the study, would be protected, and not subjected to any harm. The researcher further committed to respect participants preferences, confidentiality and anonymity whilst ensuring honesty and transparency from participants throughout the research. The gatekeeper (consent) form (Appendix 2) shows the provisions for voluntary participation in the research study and the clarification of the purpose.

All information that might identify participants has remained confidential, ensuring anonymity and compliance with the CPUT's code of ethics and the POPI Act (2013). To meet the requirements also from the POPI Act, prior agreements to participate in the study was obtained from each individual participant. In the case of the Grade 7 students', guardians also had to give consent that the students could participate in the study. In addition, to ensure research integrity the researcher and Grade 7 teachers supervised the Grade 7 students to ensure no students copied each other's work while completing their questionnaires during the semi-structured interviews. The researcher's presence at each interview session also assisted with ensuring consistency with answering clarification questions.

Various sections in the POPI Act e.g., Section (S) 13 and 14 allows for the collection of personal information for research purposes if the subjects are fully informed (S18) about the purpose for the use of the data and to keep the data for just as long as is necessary (S14). Section 15 allows for the processing of the data just for the purpose as indicated by the

researcher in S13. It is important that the individual's personalities should be always treated confidential, and individuals should not be identifiable for other purposes other than to achieve the objective of the study. The POPI act further allows for the collection of data for research purposes from children, if it is in the interest of the public and if their guardians (competent person) provided prior consent (S35). Following the literature about ethical considerations, best practices also informed the ethical conduct of the study at the selected schools. Grade 7 students, Grade 7 teachers, groundsmen, and EHPs were targeted to participate in the study. Only those who agreed to participate in the study completed questionnaires and were included in the semi-structured interviews. In compliance with the POPI Act, 2013 and the CPUT's ethical code, interviewees' identities were kept confidential by coding each participant. Only those who signed the gatekeeper permission letter (i.e., consent forms) (Appendix 2) could participate.

The process followed to get the requisite approvals started with the CPUT Research Ethics Committee approval of this study that was confirmed with the issuing of the ethical clearance certificate with reference number 209013435/04/2019 (See Appendix 10.2). After the Ethical Committee's approval, permission from the City of Cape Town was obtained to conduct the research (Appendix 10.1). Subsequently, the consent letters were emailed to the schools to approve the research. The principal signed and returned the approval form, giving the go-ahead for the researcher to deliver consent forms (Appendix 2), asking for parents' permission for their children to participate in the study. Thereafter, the Grade 7 students were also informed about the study and their willingness and agreement to participate in the study was obtained. The Grade 7 teachers, the groundsman and the EHPs involved in the research all had to sign a consent form to participate in the study. All participants rights were explained, and their right to withdraw from the study. Only participants who agreed to the study completed the questionnaires and participated in the semi-structured interviews, with their identities remaining confidential.

In support of the study the CPUT's ethical approval, the City of Cape Town's permission to use their EHPs and to conduct the study in their jurisdiction, the schools' approval, and a recommendation letter from the National Chief Director of Environmental and Port Health Services, as well as the Provincial Environmental Health Coordinator of the Western Cape and the Global Handwashing Partnership support was obtained (see Appendices 10 and 11).

CHAPTER 4: FINDINGS AND RESULTS

4.1. Introduction

This chapter, reports on the findings after analysing the data collected as discussed in the previous chapter. The discussion of the meaning and importance of these results and putting it in context, happens in the next chapter.

Where a total of 195 participates were involved in the study; 164 Grade 7 students; 10 Grade seven teachers; 6 groundsmen and 15 EHPs. The data analysis is presented according to each category of participants in this study and the group's level of influence on reaching the objectives set for the study according to the criteria set by the UNICEF Three Star Approach for WASH, Environmental Health Norms and Standards, and ISHP in schools:

OBJECTIVE 1: To determine how EHPs are informed to conduct an environmental health and hygiene intervention at their schools.

OBJECTIVE 2: To determine how EHPs conduct their school's health and hygiene interventions.

OBJECTIVE 3: To establish if the EHPs' monitoring and evaluation methods are effective.

OBJECTIVE 4: To evaluate the effectiveness of the EHPs' interventions.

It therefore makes sense to present the EHPs own views first, then the groundsmen, the teachers, the students and finally the researcher's own observations, reflections and field notes.

4.2. Environmental Health Practitioners
4.2.1. Profile of participants

A total of 15 EHPs participated in the study and n=11 was in possession of a B. Tech in Environmental Health qualification (postgraduate degree), which is displayed in table 4.1. One of the EHPs was busy completing a master's degree in public health (Appendix 12). The majority (n = 9 [60%]) of the EHP participants with B. Tech degrees, were in the age group of between 21 and 40. Further validity can be found under Appendix 12 for all the EHPs who participated in the study.

Table 4. 1: Profile of environmental health practitioners

Age	Education			Total EHP participants	%
	National Diploma	B. Tech	Busy with postgraduate studies		
21–24	0	2	0	2	13,3
25–30	2	3	1	6	40,0
31–35	0	2	0	2	13,3
36–40	0	2	0	2	13,3
41–45	0	1	0	1	6,7
46–50	1	0	0	1	6,7
51+	0	1	0	1	6,7
Total	3	11	1	15	
Percentage	20,0	73,3	6,7		100,0

4.2.2 EHPs selection processes for conducting primary school hygiene interventions

The semi-structured interviews explored how the 15 participating EHPs go about conducting health and hygiene interventions at schools from the planning stage, selection of schools and the implementation. This data collection stage was augmented by the researcher's observation notes and photographs and is discussed in Section 4.6.

Health and hygiene interventions at schools is a mandatory function of EHPs. The City Health Department applies a *Plan Do Review (PDR) as a* tool to allocated targets (KPIs) that need to be achieved by each sub-district office in each financial year. Their PDR target is to achieve the overall objectives set by the Municipal Strategic Plan. With the provided targets, the EHPs need to ensure it is reached at the end of the financial year.

During the semi-structured interviews with the EHPs, the question was posed: *Where does your school project PDR target fall? (With a range given between 30 and 59, in increments of 10).* The aim was to establish whether or not EHPs receive their information in regard to the intervention required at a school and including the process to follow. According to **EHP 1** there is no specific PDR for schools as "*HPO (Health Promotion Officer) is responsible for this target" (*Appendix 13), whereas **EHP 10** stated*: "So my office we're supposed to do ten. And*

then the other office is supposed to do ten" (Appendix 13). **EHP 5** is of the opinion that for school projects, they are "*supposed to do [thinking) … a school a month or a school every two months. I think so"* (Appendix 13). **EHP 14** thinks it is three schools per quarter: "*Yes they're broken up into groups of, I think three EHP's and then each EHP is required to do at least one school for the quarter"* (Appendix 13).

The EHPs responses from the semi-structured interview are recorded in table 4.2 and shows that just more than half (n = 8) of the participants were aware of the PDR, whereas 13% (n = 2) were unaware. The two EHPs that indicate that they are unaware were all community service year EHPs who were appointed on a one-year contract. One EHP (6,7%) indicated that she does not have any school project targets. Twenty per cent (n = 3) of the participants stated that it was the responsibility of the health promotion officer (HPO), whereas one participant (6.7%) said it was a shared responsibility between the EHPs and the HPOs. The comments from the EHPs (n = 2) said that they have no targets or not being aware of any PDR targets, are displayed below:

Table 4. 2: EHPs response to PDR targets

Categories	n	%
Aware of their targets	8	53,3
No targets	1	6,7
HPO responsible	3	20,0
Shared targets with HPO	1	6,7
Not aware of targets	2	13,3
Total	15	100,0

When asking the EHPs what informed their selection of schools when conducting interventions, twelve categories emerged (see Figure 4.1), with the top three having an equal number of responses (n = 5). The top three categories reveals that 24.1% (n = 7) of the EHPs' responded to clinical information to initiate interventions. Of these, 17,2% (n = 5) obtained information from the schools' nurse as the starting point while 6.9% (n=2) referred to sanitation audit information. According to **EHP 2**, they "*… liaise with the school nurse that obviously knows all the schools, and, yeah, they would also recommend, and they do the deworming as well, so then they obviously know"* (Appendix 14). Once a need has been identified, in the majority of cases, health and hygiene interventions are planned after consultation with the school nurse (17, 2% or n = 5), or an EHP requested for an intervention to be conducted in

their area at 17, 2% (n = 5) and a request from the school at 17, 2% (n = 5). According to **EHP 2**, they *"… liaise with the school nurse that obviously knows all the schools, and, yeah, they would also recommend, and they do the deworming as well, so then they obviously know"* (Appendix 14).
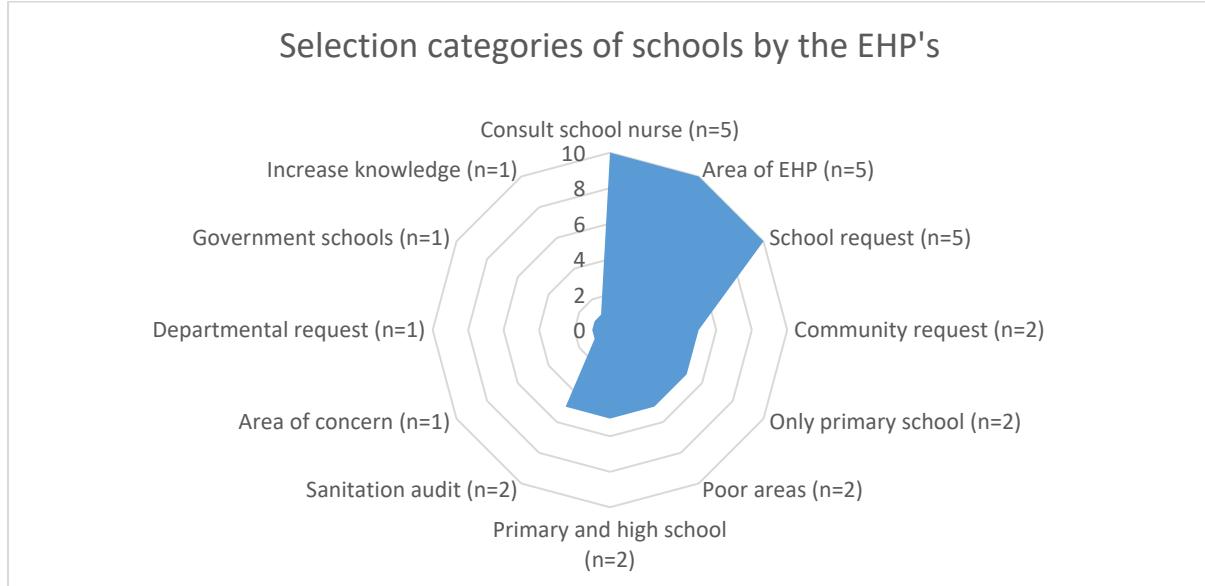
Figure 4. 1: Selection categories of schools by the EHP's

Of the 15 participants, 6,9% (n = 2) indicated that they only initiate interventions at primary schools. As expressed by **EHP 10** that their projects *"… focus[es] on the primary schools, and I would just do any school in my area. Like I have three, but I make sure at the end of the financial year I visited all my schools in terms of having a project. So, I just choose the school".* An equal number (6.9%) stated that they conducted health and hygiene intervention at both primary and secondary schools.

4.2.3 EHPs planning processes for primary school hygiene interventions

A total of 14 EHPs (N = 15) stated that they follow a planning process for health and hygiene interventions. However, one EHP indicated that no planning is done as interventions at the schools are not their responsibility. This being **EHP 3** "*Um, there wasn't actually a preparedness. We just, you know, I come in early in the morning, get the stuff ready – the colouring books, the soaps and the whatever. They would actually just briefly help me with what we are going to do. I would go and sit and listen to one or two that Z would do and then I will take over. Basically, so that's how we went about [it] with the interventions. So, there wasn't a proper way that they prepped me before the time"* (Appendix 15).

There is no formal or standardised planning process in place as figure 4.2 gives insight in how the EHPs go about planning for a specific intervention at a school with **EHP 14** explains that *"there is the pre-planning, then there's details of the project itself: we identify the needs and identify the challenges, and you have an outcome. Then the last part of the tool would be your review project. What were your shortages, what were your challenges, what were your needs, did you reach your outcome, did you meet your goals, your target? That kind of thing"* (Appendix 15). The planning process involves sourcing for material for the intervention (28,6% or n = 8), ranked the highest (rank 7). Arranging a meeting with fellow EHPs in the same office and requesting permission from the schools are tied at the next rank (Rank 5), each cited by 21.4% (n=6) of respondents. Where **EHP 6** explains their process as follows: "*So basically, we form the team and then liaise with the school and inform the principal and then if consent would be needed from the parents – consents are given, and then, yeah, we do our planning and how we* will *tackle the task and we share responsibilities, yeah, and that's all"* (Appendix 15).

These represent equally common steps in the planning phase. Brainstorming ideas for the intervention follows at the next rank (Rank 4, due to the tie at Rank 2), mentioned by 14.3% (n=4) of EHPs. Which is reiterated by **EHP 6** statement "… the *main thing is planning of projects, and I am of the opinion that I don't plan and inform the staff, so whatever planning I do, I do it jointly with the staff. I also do a lot of the logistics; however, if it is not in my area then that area is the EHP's responsibility"* (Appendix 15). Finally, other activities including creating a budget, establishing collaboration with other departments or organisations, and briefing on the day occupy the lowest rank (Rank 3 and 2, as they were mentioned with lower frequency. These represent less consistently applied steps in the planning process as described by the EHPs in this data.
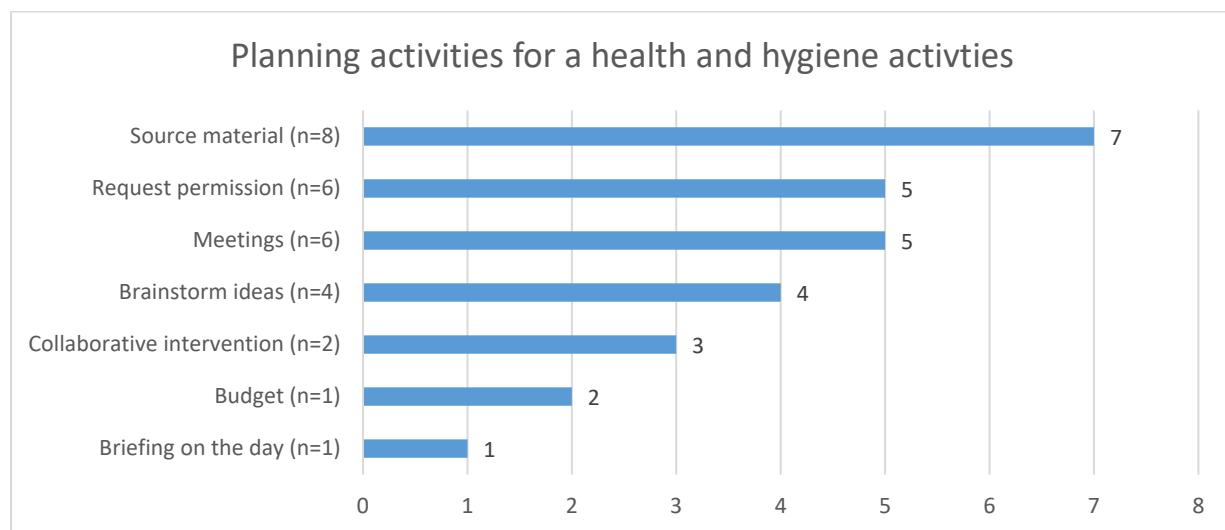
Figure 4. 2: Planning activities for a health and hygiene intervention

4.2.4 EHPs knowledge and understanding of their role in school health promotion

As the National Health Promotion Policy and Strategy 2015–2019 make specific reference to the role of legislation and the EH policy implementation and health promotion. The interrogation of EHPs knowledge and understanding of the relevant policies and legislation that should inform their interventions, was imperative for the study.

Eighty per cent (n = 12) of the EHP participants were not aware of the relevant legislation that guides health promotion, whereas just more than half (53,3%) of the EHPs were aware of the EH event Standard Operating Procedure (SOP) written by the CoCT EH Health Promotional Team and approved by the EH management structure. This is illustrated in table 4.3 below.

Table 4. 3: Environmental health practitioners' knowledge of legislation

EHPs' awareness	Legislation		SOP	
	n	**%**	**n**	**%**
Aware	3	20,0	7	46,7
Unaware	12	80,0	8	53,3
Total	**15**	**100,0**	**15**	**100,0**

The knowledge of legislation is imperative to the duties and functions of an EHP, where figure 4.3 further provides insight of how the EHPs within the study see their function and/ duties within a school environment. Figure 4.3 explains that a mandatory function for the EHPS is that of the kitchen inspections, displaying the prevalent understanding among EHPs regarding their other school-related duties, holding top rank (Rank 9), with 29% of the EHPs indicating this knowledge. Providing insight is **EHP 2** who stated, *"Well, that would obviously be all the facilities. It would be the size of the classrooms; you know, that it's not overcrowded, the ventilation, toilet, pollution, facilities, the feeding schemes, kitchens, COAs, which obviously brings into the Regulation 638 and all that."*

Notably, a significant portion also reported a lack of awareness of their obligations (Rank 8), with 18% of EHP's indicating the lack of knowledge. Confirming this lack of awareness is **EHP 5** who stated: *"Not that I know of. Yeah, I don't … I think there is one. I just haven't come across one. There probably is a regulation (laughs). Like I'm thinking about it now, there probably is one but I haven't been reading. So that's on me. I'll take responsibility for that."*

Norms and standards inspections and sanitation audits are equally recognized by a smaller group (Rank 6), with 12% of EHP's stating this function, while performing interventions and

building regulations are the least frequently mentioned other functions (all tied and ranked 1). See the state of **EHP 4** stating the importance of a sanitation audits - *"I think it's very relevant. I think it has a place, but it ends there, which is the problem. I go in, I evaluate, I make notes, this is what needs to change and I leave it with the principal and nothing changes. So, it's one thing being audited, but when you don't have the infrastructure or the means to actually repair things and get things right, then why am I coming and doing the same thing and where's the enforcement? What's the next step? Because I'm also trying to build a relationship with the school here, [but they] want me to serve a notice now, but I must come in to do education – so it's conflicting, yeah, because [the] EHP must be everything. That's the problem. Define what you want us to do in school. Do you want us to audit? Then that's one role. Do you want us to educate?"* (Appendix 16).
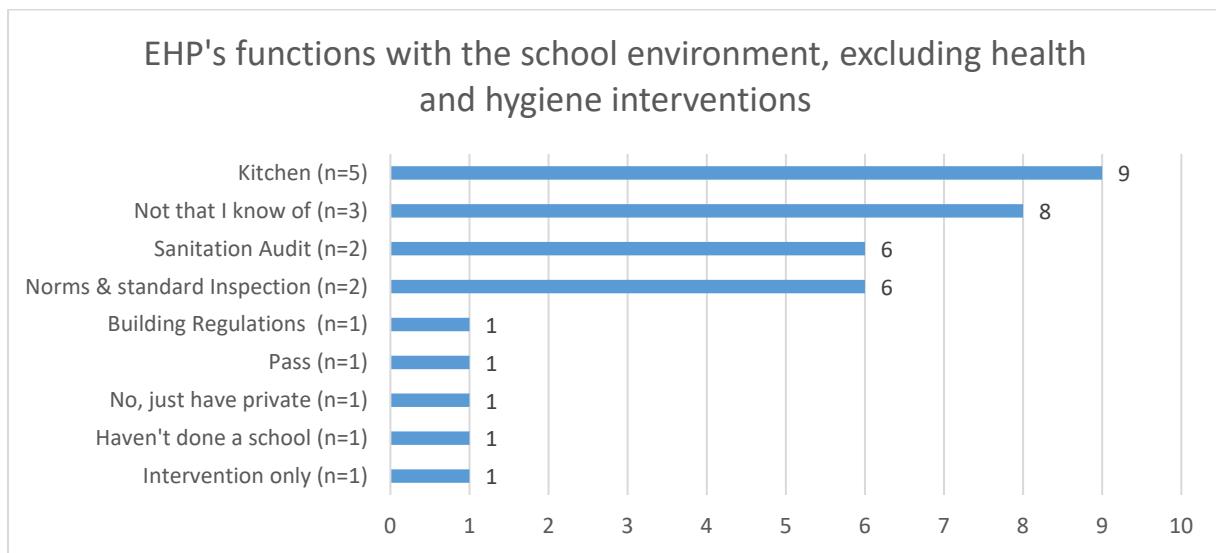
Figure 4. 3: EHPs functions within the schooling environment, excluding health and hygiene interventions

4.2.5. EHPs' perspective on school monitoring and evaluation

Responding to questions 7, 8 and 16–22 on monitoring and evaluation, the EHPs explained that interventions at schools are recorded using various tools and programmes (see Figure 4.4). A total of 15% (n = 5; N = 32) used the COMBI tool, with a 19% project tool (n=6; N=32) being used and 16% (n = 5; N = 32) used attendance registers. During the research, a copy of the COMBI tool, project tool and the attendance register was not requested to identify if it is the same tool that each of the EHPs are using, although it is called different names among the EHPs. Other recording methods included

Recording of interventions

- Report including experience and evaluation — 19%
- Project Tool — 19%
- COMBI tool — 15%
- Attendance register — 16%
- Upload on teamsite — 3%
- Pictures and videos — 28%
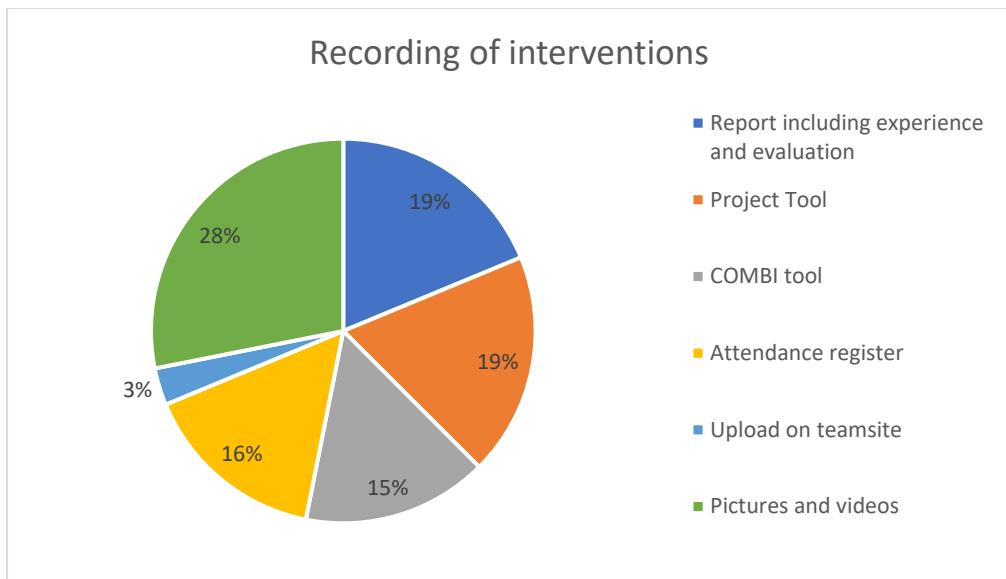
N=32 is the total number of recorded answers by the EHPs.

Figure 4. 4: EHP's health and hygiene intervention recording methods

Five EHPs indicated that they are the portfolio holder in the office (Appendix 17) and therefore responsible for instituting projects in their jurisdiction and subsequently responsible for all the health promotion and education interventions too. The following duties were identified as their responsibility: 1) compiling an annual project plan; 2) ensuring PDR targets are met and specifically in informal settlements; 3) co-ordinating projects for the office (who, what, when); 4) monthly planning and scheduling meetings with staff; 5) maintaining a master database; 6) submitting projects to the health promotion officer; 7) collating statistics and goals achieved; 8) drafting monthly reports to management; 9) verifying and submitting COMBI tool information; 10) monitoring projects; 11) managing and allocating intervention-related resources (pamphlets, posters, promotional items like rulers etc.); 12) monitoring KPA/KPIs requirements and ensuring those requests are met; 13) attending meetings 14) brainstorming ideas 15) liaising among staff, HPO and management; 16) assisting new staff to implement monthly projects and 17) conducting collaborative interventions with other departments.

However, despite the long list and a mention of monitoring projects and the submission of the COMBI tool, project evaluation was not listed as one of the duties of the project portfolio holder. Furthermore, ten out of the 15 EHPs stated that the manner in which interventions are recorded does not indicate if it had been effective. **EHP 4** provides insight*: "No, the standard thing is the COMBI tool to complete, but then once it's done, then you write up. But it's basically, background, why you went, what was rolled out, how was it experienced by the kids and then evaluation. What would you improve on?* (Appendix 18). He further elaborated of the evaluation of the COMBI tool stated that they don't really review the tool: *"It is not a formalised*

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thing, um, it's like I always say, get feedback from the teachers in the room, get feedback from students and also like you've given them all this information, then we normally do like a little pop quiz at the end, who can remember this and this and this? So, we used to give sweeties, but we don't anymore because it's against policy. So, but now we give rulers and things to give out so that's great. So, it's evaluating how the children experienced it. I think we lack in how it was put together; do you know what I mean? So, I always feel like the school needs to give feedback as to how the school was approached, how the process was, setting up the date, the time. But I mean like we don't have anything like that" (Appendix 18).

These duties listed by the project portfolio holders, are performed over and above an EHP's routine work and the ad hoc municipal health functions within their service area. This requires additional time to plan, research and administration tasks, in figure 4.5 you can see the listed constraints and challenges provided by the EHP's. With resources and finances being 26% (n=12; N=46) being the biggest constraint and challenge, and second biggest at 13% being time (n=6: N=46).
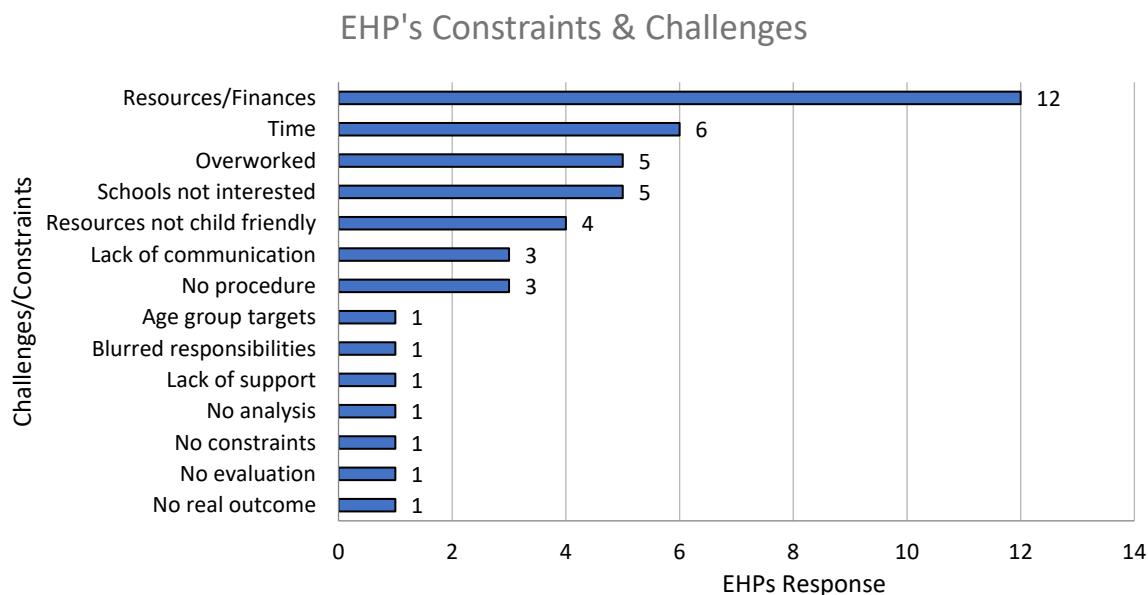
Figure 4. 5: EHPs responses to their list of constraints and challenges

4.2.6 EHPs conducting the health and hygiene interventions

4.2.6.1 Ways to conduct interventions

During the semi-structured interview, all the EHPs stated that they conduct their interventions (Appendix 19) via a verbal presentation with illustrations; and a PowerPoint presentation if a

request is received and the school can accommodate it. School 5 was the only school where the intervention was conducted using a drama skit. Figure 4.6 elaborates on the specific items used, apart from flip charts, posters and pamphlets.
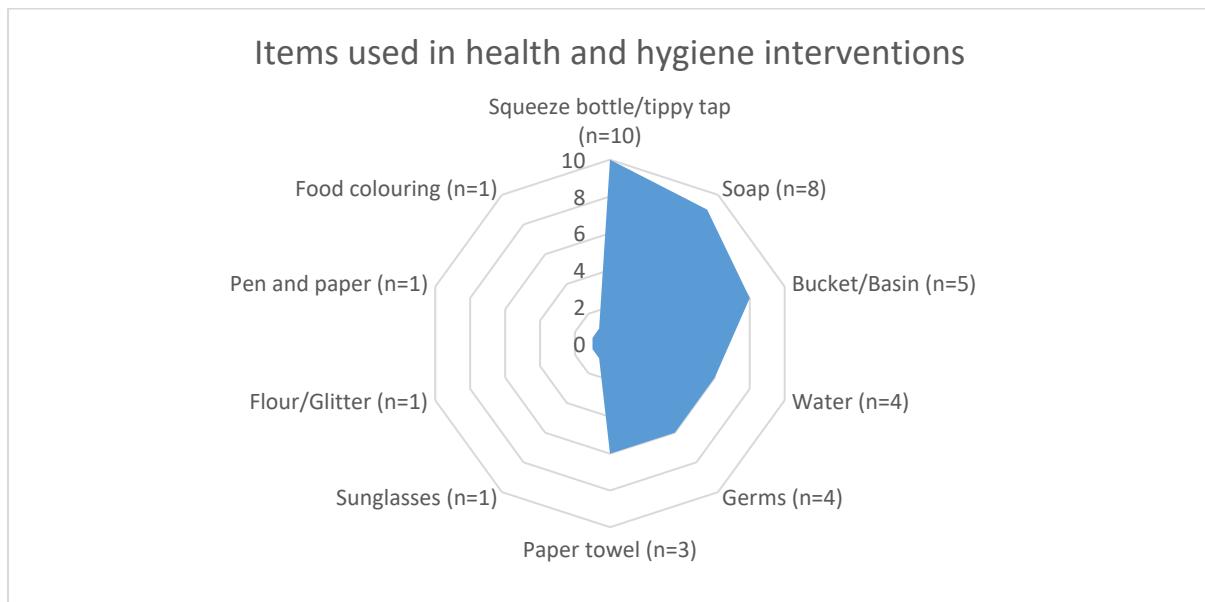
Figure 4. 6: Items used in health and hygiene interventions

Of the 15 EHPs, ten stated that they use the squeeze bottle/tippy tap (n=10) as discussed in the South Africa UNICEF WASH report 2017. Of all these items used by EHPs during their interventions, the squeeze bottle is mostly used, with the highest percentage being 26,3% (n = 10) and ranked 10. The second-most used item, at 21%, is soap (n = 8) and ranked 9. These items are used to demonstrate washing hands with soap and water, which is directly linked to the topics of hand washing, bacteria (germs) and diarrhoea. To illustrate germs on hands and the importance of washing with water and soap, flour, glitter and food colouring was used during the various EHPs interventions. EHPs show students how to remove germs from their hands by demonstrating it with these materials. The images in figures 4.7, 4.8 and 4.9 show the three-step hand washing process being demonstrated during an intervention at school 6.

Figure 4. 7: Step 1: The environmental health practitioner allows the Grade 7 students to touch a ruler with flour and added colour, which represents bacteria (germs).

Figure 4. 8: Step 2: The environmental health practitioner made a point of showing that the Grade 7 learner hands are now dirty, explaining about bacteria and how it can make you sick, also referring to diarrhoea.

Figure 4. 9: Step 3: A handwashing demonstration, with soap and water, where the environmental health practitioner shows the correct way of how to wash one's hands, using soap and the tippy tap during this intervention.

One EHP used an innovative way to keep the students' attention. She hung a banner with the word "HANDWASHING," see figure 4.10. A question was linked to each letter and if answered

correctly, the learner would win a prize such as a ruler, any health promotional material or sweets.

Figure 4. 10: A formal Q&A session with the Grade 7 students after the intervention was conducted.

4.2.6.2 EHPs' ideas on effective ways to change behaviour

The EHPs were interrogated about the approaches they employ to facilitate health and hygiene behaviour change among students (Appendix 20). Of the 15 EHPs, 14,8% (n = 4) stated that putting a strategy in place for health promotion would assist in the changing behaviours and ensure that interventions are captivating and innovative (see Figure 4.11). They also mentioned that health and hygiene interventions should not be once-off events (Appendix 20). As **EHP 15** asserts: *"What's nice is that the best we can get for evaluation is we go back to a school we have been to before and intervention, then it's better when we come back because for some time the behaviour changes, you know, and it's even better for someone from outside to hear it from the teachers. So that's the best feedback – that after interventions there is some change".* When asked to clarify the practitioner explained: *"So [what] I'm saying is if we had to go back to a school or if they want a project or something, after an intervention, there is some change in behaviour to the students so we don't have any measure for us to go back and see if there is anything. But from the teachers, now that you were there, after some time the behaviour changed. So, they actually promote us going back more, so it becomes tradition or so to speak and not just a once-off, and they feel it's better when we do the teaching than them. Any kind of behaviour."*

Additional figure 4.11 shows that 11.1% (n=3) all stated that a needs analysis (i.e., sanitation audit) and making children the advocate for hand washing, would contribute to a change in

the behavioural mindset of the Grade 7 learner towards WASH (Water and Sanitation Hygiene) topics. Reinstating this sentiment by **EHP 1**: "*Start at the grassroot level, done at the youngest age; need to analyse, discuss with the people of the interventions (get it from the people); research their needs and wants and then start with the interventions.*"

Furthermore, from the EHP 1 statement figure 4.11 shows that 7.4% (n=2) providing ideas to change behaviour of the Grade 7 learner by staring at early grassroot phase, obtain the buy-in of teacher, resources and budget, implementing a rewards system and including community/households within the interventions.

EHPs ideas to change the behavriour/mindsets of the Grad 7 students

Idea	Value
Put a strategy in place for health promotion (n=4)	11
Captivating and innovative presentation (improve) (n=4)	11
Needs analysis (school and where they come from) (n=3)	9
Making children advocates (n=3)	9
Include community and households (n=2)	4
Rewards system (n=2)	4
Obtaining adequate budget and resources (n=2)	4
Teachers/School buy-in (n=2)	4
Start at grassroots (young) (n=2)	4
Not just EHPs' responsibility (n=1)	1
Monitor projects (n=1)	1
Understand children's behaviour (n=1)	1

Figure 4. 11: EHPs ideas to change the behaviour/mindsets of the Grade 7 students

4.3 Groundsmen

The head groundsman from each school participated in the study by way of a semi-structured interview, completing a sanitation audit, with the researcher and accompanying the researcher on a walk-through environmental assessment of the school.

With a ratio benchmark taken from the (Department of basic Education (DBE), South Africa, nd.), the ratio for groundsmen to students is 1:100 (Department of Basic Education, South Africa, 2012). Based on the above-mentioned ratio, there is a general shortage of groundsmen. The groundsmen-to-learner ratio ranged from 1:148 (school 2) to 1: 340 (school

1), with an average ratio of 1 groundsman for every 245 students – that translates to less than half the number of groundsmen prescribed.

Table 4.4 shows that, in addition to the lead groundsman, there are additional male and female staff who assist with the upkeep of the facility.

Table 4. 4: Profile of groundsmen and ratio's

School	Quintile	Groundsmen participated	Male groundsmen at school	Female groundsmen at school	Total	Total number of students	Ratio
1	3	1	2	0	3	1 021	1: 340
2	3	1	0	1	2	295	1: 148
3	5	1	1	1	3	936	1: 312
4	4	1	3	1 (supervisor)	5	849	1: 170
5	5	1	1	2	4	1 250	1: 313
6	5	1	1	1	3	541	1: 180
Total		**6**	**8**	**3**	**20**	**4 892**	**1: 245**

Data collected from the groundsmen as shown in figure 4.12, point to learner behaviour as the biggest challenge. As the groundsmen mention a lack of toilet etiquette (rank 9) resulting in behaviours like faeces smeared on walls and urinating and defaecating next to toilets, in stairwells and in the open. Signs of such actions were reported at four of the six schools. This is exacerbated by a general lack of respect and language barriers, mentioned by the groundsmen (Appendix 6).
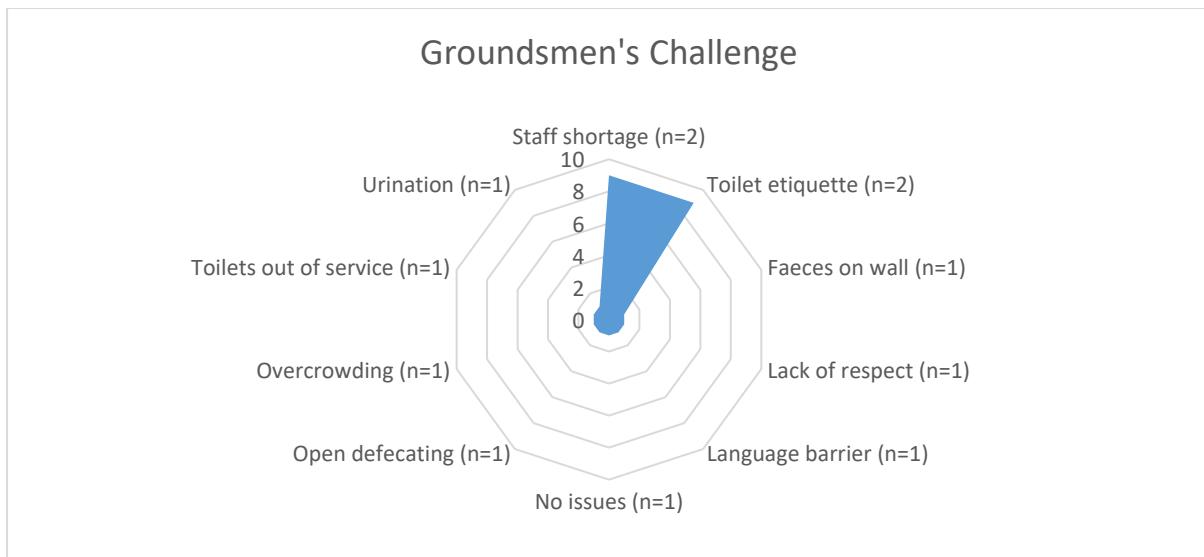
Figure 4. 12: Groundsmen's challenges

Furthermore, the data obtained from the groundsmen revealed that children have no part in cleaning or assisting in keeping the toilets clean, see table 4.5 below; however, each of the groundsmen stated that there is a cleaning schedule for the ablution facilities. If one compares the various quintile schools, the lowest quintile (being quintile 3) was the only school that indicated there are generally no problems at the school. Quintile 4 and 5 schools, meanwhile, have a greater challenge. Cleaning does occur between two and six times a day at the various schools. It was not possible to distinguish if the amount of cleaning is directly proportionate to the vandalism, but it was stated that all the groundsmen clean after break time.

Table 4. 5: Groundsmen's cleaning schedules

School	Quintile	Groundsmen's cleaning schedules	Challenges
5	5	Twice: Clean in the mornings and after an interval Observations twice during the day, where staff flush and clean if it is an emergency (i.e. burst pipe)	Urinal general problem Open defecation
3	5	Morning After each break (10:00 and 12:15) Before going home (15:30 and 16:00)	Children from more disadvantaged backgrounds are friendly and respect the toilets Spoilt children do not care about the state/hygiene – "It's not my job," children would say Stated that education on respecting toilets is needed Open defecation

6	5	Morning check-up After every break time Before leaving *Four times a day	General vandalism Menstrual pads left on the floor; girls do not flush toilets; boys do not lift seats
1	4	Male cleaning the girl's toilets Six times a day Morning (6:15) before children arrive Before break time *twice (two breaks/day) After break time *twice Before going home	Vandalism Staff cannot get to maintenance because groundsmen must supervise toilets to prevent vandalism
4	4	Three times: morning, after break time and afternoon	Urinals are bad (i.e. poor state) Vandalism in the boys' toilets
2	3	Before schools start After the two break times After school	Children urinate next to the toilet Generally no problems

Evidence of these behaviours were documented by the researcher through using the semi-structured interview and photographic gestalt depicted in figures 4.13 and 4.14. The groundsmen also mention that these behaviours should be targeted when planning a health and hygiene intervention. Inadequate supplies and infrastructure, overcrowding, staff shortages and faulty toilet facilities are also mentioned as challenges.

Figure 4. 13: Urination on the stairs

Figure 4. 14: Faeces on toilet walls

4.4 Teachers

4.4.1 Profile of participants

A total of 10 Grade 7 teachers participated in the questionnaire covering the 6 randomly selected schools, where table 4.6 displays the number of teachers that participate in each school and their quintiles.

Table 4. 6: Participating Teachers

School	Quintile	Grade 7 teachers
1	3	2

2	3	1
3	5	1
4	4	2
5	5	2
6	5	2
Total		**10**

4.4.2. Grade 7 teacher's perspective

4.4.2.1. Views on general state of hygiene in toilets

Grade 7 teachers' views on the general condition and hygiene of ablution facilities at the schools, were ranged from offering no response to conditions being in a poor state and requiring more cleaning. Additionally, infrastructure being old and reeking when blocked, though the toilets are being cleaned every day, students vandalise the facilities. Table 4.7 provides the Grade 7 teacher's opinions towards the general hygiene state of the toilets.

Table 4. 7: Grade 7 Teachers opinion towards the general state and hygiene of toilets

Quintile	School	Teachers
5	3	Poor condition, require more cleaning The second set of toilets are not opened
5	5	Old infrastructure, but clean. Bad smell; urinal is blocked
5	6	Good; cleaned three times a day
4	1	No response
4	4	Students vandalise toilets. Toilets get cleaned every day
3	2	Satisfactory

4.4.2.2. Views on responsibility to oversee hygiene practices

The Three Star Approach, star 1, places great emphasis on the importance of handwashing with soap and water. Although the topic of handwashing is covered by the EHPs, there is no adult supervision during breaks to ensure that this is being done. A question was posed to the Grade 7 teachers and all of them stated that they do not supervise handwashing practices (Appendix 7).

Teachers from schools 5 and 6, being quintile 5 schools, indicated that it is the responsibility of the prefects of the school – Grade 7 students. This relates to objective 3, which focuses on monitoring and evaluation; the data relating to adequate resources such as soap and water will be provided.

4.5 Grade 7 students
4.5.1 Profile of participants

While all 527 students were invited to participate using a convenience sampling strategy, only 164 students agreed (Column 6 – Table 4.8) and completed the consent forms. This response translates into an overall 31,1% participation rate (Column 8) across the six schools where the participation ranges from 6 to 55% among the schools (Column 8).

For context, table 4.8 provides an overview of each school's quintile (second column) and the number of EHPs at each school (third column). Columns four and five record the intervention dates and the last three columns, the number of Grade 7 students that had participated both events and had completed the Grade 7 questionnaire. The last two columns indicate the number of Grade 7 students in the school and the last column records the percentage of students that had participated.

Table 4. 8: An overview of the participation by the environmental health practitioners and Grade 7 students over the period of the study

Schools	Quintile	EHPs	1st date	2nd date	Grade 7 students	Total number of Grade 7 students	Participation %
1	4	1	10-09-2019	08-10-2019	28	79	35,4
2	3	2	07-10-2019	04-11-2019	10	39	25,6
3	5	2	17-10-2019	15-10-2019	6	99	6,1
4	4	2	11-10-2019	22-11-2019	20	76	26,3
5	5	5	12-09-2019	10-10-2019	61	164	37,2
6	5	3	14-10-2019	15-11-2019	39	70	55,7
Total		15			164	527	31,1

The six randomly selected schools that participated (Column 1) fall within quintiles 3 to 5 (Column 2). These as explained in section 3.4, are more affluent schools. The poorest schools (quintiles 1 and 2) were not included in the study due to logistical challenges.

Table 4.9 displays the spread of the ages of the Grade 7 learner participants across the six schools, with 17,7% (n = 29) of the students being older than 13 years of age. On average, 81,1% (n = 133) were between 12 and 13 years of age, with 2 (1,2%) that did not reveal their age group.

Table 4. 9: Profile of the students' ages

School	Quintile	12 yrs	13 yrs	14 yrs	15 yrs	16 yrs	None	Total
1	3	8	13	5	1	1	0	28
2	3	1	7	1	1	0	0	10
3	5	2	2	1	0	0	1	6
4	4	4	10	4	1	0	1	20
5	5	17	35	9	0	0	0	61
6	5	11	23	4	1	0	0	39
Total		43	90	24	4	1	2	164
Percentage		26,2	54,9	14,6	2,4	0,7	1,2	100,0

Figures 4.15 show Grade 7 students completing their first round of questionnaires, under the supervision of the researcher and Grade 7 teachers and provides evidence that the questionnaires were completed by a grade 7 learner themselves.

Figure 4. 15: School 2

4.5.2 Pre-intervention questionnaire

Before the EHPs conducted their educational interventions, the researcher provided the Grade 7 students with a pre-intervention questionnaire to establish a baseline of their knowledge of hygiene practices. The pre-questionnaire was submitted on the same day as the intervention. The pre-intervention questions probed whether students were aware that EHPs had previously visited the school and if so, whether they were able to recollect what had been shared at that intervention. Questionnaire 1 consisted of 10 questions. There the below table 4.10 created a baseline for the grade 7 learners, where 9.1% stated that they remembered a topic of personal hygiene (n=15). However, this was done before the intervention, to assess the retention of information, as EHP's had been at their school before.

Table 4. 10: Health and hygiene (topics) knowledge baseline for Grade 7 students

Topics remembered	n	%
Personal hygiene	15	9.1%
Can't remember	15	9.1%
Handwashing	5	3.0%
Environment	4	2.4%
Environmental health	3	1.8%
Children get disease	3	1.8%
Health	2	1.2%
Safe water	2	1.2%
Safety	1	0.6%
Life & plants	1	0.6%
Drink water	1	0.6%
Pollution	1	0.6%
Social well-being	1	0.6%
No answer	110	67.1%
Total	164	100.0%

The above table 4.10 alluding to the possible lack of retention of information and effective means of knowledge transfer from the EHPs to the Grade 7 students. Additional no answer speaks to the fact that an EHP has never been to the school before, displaying that EHP's have been to the school previously.

4.5.3 Post-intervention questionnaire

The aim of the second questionnaire was to establish the levels of recollection that the students had regarding the health and hygiene interventions topics discussed by EHPs during the intervention. It consisted of 21 questions to establish if knowledge was transferred during the interventions. Probing questions were posed and the answers compared to that of the EHPs who had conducted the interview.

Question 5 in the post-intervention question asked if the intervention was conducted in their home language to ascertain the students' comprehension levels. The majority of the students (89,6%) indicated that the intervention was conducted in their home language. The rest (10,4%) indicated otherwise. However, 91,5% of them indicated that they enjoyed the EHPs' presentations. The data revealed that providing questionnaires only in English was limiting, as there where both Afrikaans and Xhosa speaking students within the schools, this was further supported by the question 3 and 4 asking about the home language and language spoken at school, see table 4.11 below.

Table 4. 11: Languages spoken by Grade 7 students

Language	Home		At School	
English	98	60%	134	82%
Afrikaans	25	15%	25	15%
Xhosa	33	20%	3	2%
Other	8	5%	2	1%
TOTAL	164	100%	164	100%

Regarding questions on topics discussed in the EHPs' presentations, analysis of the data revealed that there was an increase in knowledge. The following differences were recorded and can be found in figure 4.18: 1) an increase from 3% to 60% (N=164; n=98) for awareness on hand washing; 2) recalling the mention of disease increased from 2% to 29% (N=164; n=47), and 3) grasping the concept of personal hygiene improved from 7% (N=164; n=11) to 29%. The baseline awareness of diarrhoea went from zero to 10% post-intervention.

Although the topics of hepatitis A, pests and several aspects of waste management were mentioned during the intervention, there was no recollection among the students. Only littering and keeping the environment clean were mentioned. Of the 164 students answering the questions, 83% could not remember anything (N=164; n= 136).
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Figure 4. 16: Grade 7 topic baseline vs topic recollection after EHPs intervention

Handwashing — After EHP's Intervention: 60%, Baseline: 3%
Disease — After EHP's Intervention: 29%, Baseline: 2%
Personal Hygiene — After EHP's Intervention: 26%, Baseline: 7%
Diarrhoea — After EHP's Intervention: 10%, Baseline: 0%
Littering/keep environment clean — After EHP's Intervention: 9%, Baseline: 0%
Environmental Health — After EHP's Intervention: 7%, Baseline: 5%
Toilet hygiene — After EHP's Intervention: 5%, Baseline: 0%
Can't remember — After EHP's Intervention: 4%, Baseline: 83%
Water Safety — After EHP's Intervention: 2%, Baseline: 1%
Saving water — After EHP's Intervention: 1%, Baseline: 0%
ORS — After EHP's Intervention: 1%, Baseline: 0%
Not Here — After EHP's Intervention: 0%, Baseline: 3%

Topics spoken about by the EHPs, but not recollected by the Grade 7 students was: Hepatitis A, Pest (flies, rodents and worms) and squeeze/tippy tap. These were note mentioned in the graph above, as it did not feature in the Grade 7 baseline or recollection of information after the EHPs intervention.

Figure 4. 16: Grade 7 students' baseline recollection versus the Grade 7 recollection after the EHP's intervention

4.5.4 Follow-up questionnaire

The follow-up questionnaire was given a month after the intervention took place and focused on behavioural questions, see table below providing insight to the Grade 7 students' behavioural attitude.

Table 4. 12: Insight to Grade 7 students' attitude and behaviour

	Activity	No of students	Percentage
When the bell rings for break, what is the first thing you usually do when leaving the class?	Eat your lunch	67	40.9%
	Play outside	23	14%
	Go to the bathroom	74	45.1%
	TOTAL	**164**	**100%**
Do you think people's hands are generally dirty?	**Yes**	**No**	**TOTAL**
	130	34	164
	79.3%	20.7%	**100%**
Do you use both soap and water at home to wash your hands?	**Yes**	**No**	**TOTAL**
	158	6	164
	96.3%	3.7%	**100%**
Is there always water and soap for you to wash your hands at school?	**Yes**	**No**	**TOTAL**
	47	117	164
	28.7%	71.3%	**100%**

Table 4.12 showing that 71.3% (n=117) across the 6 schools state that there isn't always soap and water available for washing of hands, indicating they are aware of the practice that is required. However, they cannot implement it, according to the Three Star Approach, where water and soap is part of the requirements to achieve star 1. Supporting the notion of the Grade 7 knowing the importance of practicing handwashing, 79.3% (n=130) stated that they think people's hands are generally dirty.

4.6. Researcher's audit, observations, and reflections

The researcher conducted both a sanitation audit and environmental health assessment, through using a criterion from both the Three Star Approach and the Integrated School Health Policy (ISHP) and the Environmental Norms and Standards to use as a checklist, whilst

conducting the audit and assessment. For the purpose of this study, a combination of the mentioned norms and standards has been labelled as the reference tool throughout this study.

Additional to this photographic evidence was taken and during this section this evidence will be provided. The researcher was accompanied by the head groundsman, where the sanitation audit and the environmental assessment took place before the intervention conducted by the EHPs and a month after, before the follow-up questionnaire was done with the Grade 7 students.

The sanitation audits and environmental assessments were conducted during a walkabout with the groundsman at each school. Two sets of walkabouts took place. The first walkabout occurred prior to the students completing the first and second set of questionnaires. Then once the intervention by the EHPs had been done, and before the third questionnaire was given to the students, a second set of walkabouts were organised. Thus, an environmental assessment and a sanitation audit were conducted at each of the six schools, one month apart. This gave the researcher an opportunity to observe the state of the school premises and take photographs to document the visual observations a month apart. Another goal was to establish a possible monitoring and evaluation tool that could be used in the EHPs' interventions. The first sessions took approximately two to three hours and included the EHPs' interventions with students and them completing the second set of questionnaires. The second sessions took about 90 minutes each. Table 4.13 shows the different schools and the times the photographs were taken. The focus was on the ablution facilities, the kitchen and the sick bay. The reference to "onset" is the first data collection on a particular date, as indicated in Table 4.13, and "end" indicates the follow-up one month after the first data collection.

Table 4. 13: School data collection schedule

School	Suburb	First session	Started	Ended	Second session	Started	Ended
School 1	Factreton	10-Sep-19	09:00	12:00	08-Oct 19	09:00	11:20
School 2	Westridge	12-Sep 19	10:00	12:10	10-Oct 19	10:00	11:30
School 3	Strandfontein	17-Sep 19	09:00	12:10	15-Oct 19	09:00	10:30
School 4	Milnerton	11-Oct 19	09:00	12:10	08-Nov 19	09:00	10:30
School 5	Durbanville	08-Oct 19	11:00	13:20	04-Nov 19	11:00	12:40
School 6	Silvertown	14-Oct 19	08:00	10:00	15-Nov 19	10:00	11:30

4.6.1. Sanitation audit

The data that emerged from a sanitation audit conducted were plentiful and valuable to shed light on the effectiveness of EHPs school interventions.

Toilet and handwash basin ratio - According to the National Environmental Health Norms and Standards (2015), the ratio for toilet and handwash basins is one toilet to every 25 children. Table 4.14 indicates that none of the schools participating in the study was compliant. To exacerbate the situation several toilets were out of order at the time of the audit, which can be identified by the bold figures in the table and were not included when calculating the ratios as students did not have access to them. At only one school out of six showed evidences that the girl's ablution facilities adhered to the ratio requirements, and all were in working order. The highest non-compliance of ablution ratios was at quintile 5 schools. The reason for this non-compliance was partially answered by the groundsmen and the Grade 7 teachers, which will be elaborated under school 5 in the next section of the environmental assessment.

Table 4. 14: Ratios of schools' ablution facilities

		Toilets (1: 25)		Handwash basin (1 : 25)	
Schools (quintiles)	**Total number of students**	**Girls' ratio**	**Boys' ratio**	**Girls' ratio**	**Boys' ratio**
1 (4)	1 021	74	**100**	87	83
2 (3)	295	29	37	49	49
3 (5)	936	<u>**29**</u>	**67**	43	**233**
4 (4)	849	**28**	43	**210**	**215**
5 (5)	1 250	**36**	**42**	**309**	**211**
6 (5)	541	34	34	**90**	**136**

*The toilet ratios are taken from the National Environmental Health Norms and Standards (2015).

General state and hygiene of ablution facilities - The overall state of the ablution facilities was rated as "good" (i.e., being clean); "average" (i.e., where there was toilet paper on the floor and a bad odour); and "poor" (i.e., where toilet paper couldn't be seen and there was water on the floor, with faeces observed on the walls or floor). As documented by the researcher's photographs and illustrated in Table 4.15 below, displays the general state and hygiene conditions of the ablution facilities were average or sub-standard with damaged and missing doors in both the boys and girl's toilets. Schools 3, 4 and 5 demonstrated the poorest hygiene

levels during both data collection sets, which will be discussed under section 4.6.2 (environmental assessment).

Table 4. 15: Sanitation audit findings on the general state and hygiene of ablution facilities by the research

Schools	Quintile	Toilet hygiene	Hand wash basin hygiene	Doors damaged/missing
1	4	Average	Average	Doors damaged in boys' toilets
2	3	Average	Average	In order
3	5	Poor	Poor	Three doors missing: one in the girls' toilets; two in the boys'
4	4	Poor	Poor	Two doors missing (one in the girls' toilets and one in the boys')
5	5	Poor	Average	Two doors were missing in the boys' toilets; these have been replaced
6	5	Average	Average	In order

During the research the question was posed to the teachers and groundsmen about the general state of and hygiene of the toilets, where table 4.16 provides further insight to the ablution facilities of the various schools. The comparison between the groundsmen and teachers varies for schools 2 and 6, with school 6's response from the teacher and groundsmen being the complete opposite. Consequently, based on the information in the table 4.16, vandalism by the children, ageing infrastructure and a lack of personnel are the factors that have contributed to the toilets and handwash basins being out of order. However, this does not account for the population of the schools, which is overcrowded (based on the provided ratio of 1: 25). In addition, vital information was obtained from groundsman 3 and 6, providing insight into specific topics that need to be addressed during interventions by EHPs. This includes discussions on the correct use of a toilet and how it works; menstrual hygiene; and respecting the school's ablution facilities.

Table 4. 16: The general state and hygiene of the toilets seen by the teachers and groundsmen

School	Quintile	Teachers	Groundsmen
1	4	No response	Vandalism Staff cannot get to maintenance because groundsmen must supervise toilets to prevent vandalism
2	3	Satisfactory	*Children urinate next to the toilet* *Generally no problems*
3	5	Poor condition, require more cleaning The second set of toilets are not opened	Children from more disadvantaged backgrounds are friendly and respect the toilets Spoilt children do not care about the state/hygiene – "It's not my job," children would say Stated that education on respecting toilets is needed
4	4	Learners vandalise toilets Toilets get cleaned every day	Urinals are bad (i.e., in a poor state) Vandalism at the boys' toilets
5	5	Old infrastructure, but clean Bad smell; urinal is blocked	Urinal is a general problem
6	5	Good; cleaned three times a day	*General vandalism* *Menstrual pads left on the floor; girls do not flush* *Boys do not lift seats*

Supplies and facilities - There was no soap available in the ablution facilities; and, although menstrual bins are provided, according to **groundsman 6** there is a general lack of hygiene practices among students. This was confirmed in the responses from Grade 7 students to the questionnaire. Asked whether soap and water were available at their schools, a 120 out of the 164 participants stated that there was no soap and water available. Two out of 10 teachers corroborated their statements. Figure 4.17 summarises the researcher's observations of the ablution's facilities. All the facilities at the schools had running water while none had soap available. All had menstrual bins but only 16.6% had toilet paper available. In a third of the schools, open defaecation occurred.

Observations within the ablution facilities

Observations (y-axis) / Percentage (%) (x-axis):
- HW posters: 33,33
- Menstrual bins: 100,00
- Open defecating: 33,33
- Toilet paper: 16,67
- Soap: 0
- Running Water: 100,00
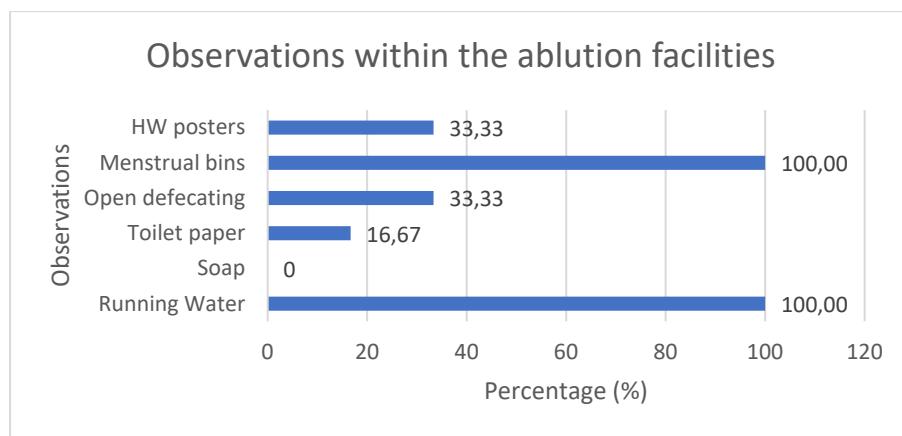
Figure 4. 17: Observations in the ablution facilities

The table 4.17 below provides additional information with regards to the availability of soap and water, as this question was asked to the teachers, groundsmen and students. All the schools have access to potable municipal running water, except for school 2, which receives borehole water from a neighbouring farmer. The teachers at school 2 and 6 stated that soap is available at their school; however, it is not available at the ablution facilities for Grade 7 to wash their hands. It is evident from the responses in figure 4.17 that soap is not available at the ablution facilities.

Table 4. 17: Availability of soap and water by the teachers, groundsmen and students

School	Quintile	Teachers	Students							Groundsmen (during the sanitation audit)
---	---	---	No	%	Yes	%	No answer	%	Totals	
3	5	No	5	100,0	0	0,0	0,0	0,0	5	No
5	5	No. Soap is available in class; however, learners must bring their own sanitiser	50	83,3	10	16,7	0,0	0,0	60	No, children must bring their own soap
6	5	Yes, soap in the classrooms	21	51,2	20	48,8	0,0	0,0	41	No, soap in the classroom
1	4	No, soap was issued to the classrooms, but no longer	20	71,4	4	14,3	4,0	14,3	28	No, sanitiser in class

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4	4	No, sanitiser in the class	17	85,0	3	15,0	0,0	0,0	20	No, soap in classroom
2	3	Yes, kept in class with a bucket of water, which is used after breaks	7	70,0	3	30,0	0,0	0,0	10	No, so is available in class/at reception
Total			**120**	**73,2**	**40**	**24,4**	**4,0**	**2,4**	**164**	

Additionally menstrual hygiene management is in place. During the observations of the sanitation audit (as shown in Table 4.18), it was evident that all schools had menstrual hygiene facilities. However, there are no prescribed norms in the National Environmental Health Norms and Standards for the ratio of bins to female scholars. However, the results shown in Table 4.18 indicate an average of 116 girls per sanitary bin, with a ratio that ranges from 52 (school 3, quintile 5) to 269 (school 6, (quintile 5). Crankshaw, Strauss and Gumede (2020) indicate that although the majority of the learners use the bins in their study (Gauteng) to dispose of sanitary products, 41,4% of the participants keep their sanitary products in their bags, disposing of it at home. The key reasons are inadequate sanitation and waste disposal facilities.

In this study, the groundsmen at school 6 stated that there are constant issues of girls throwing sanitary pads next to or in toilets (Table 4.18). However, none of the EHPs indicated that they educate learners on the importance of menstrual hygiene.

Table 4. 18: The availability of menstrual facilities at the schools

School	Quintile	Total girls	Bins	Ratio bin: girls	Availability of bins for junior and senior grades
1	4	521	5	1:104	5 bins (senior)
2	3	147	1	1:147	1 bin (senior)
3	5	470	9	1:52	4 bins (senior); throw it in the toilet/next to the toilet 5 bins (junior)
4	4	419	2	1:210	2 bins (senior)
5	5	617	3	1:206	3 bins (senior)
6	5	269	1	1:269	1 bin
Total		**2 443**	**21**	**1:116**	

Supervision of the sanitation facilities

With the observations of the ablution facilities, daily supervision is part of the criteria for the Three Star approach, where through the sanitation audit the question was posed in terms of supervision of the ablution facilities. The results, as given in Table 4.19, show that no assistance was forthcoming from the teachers, and primary responsibility is with the prefects and groundsmen. Introducing group handwashing sessions could provide a more opportune time to conduct further health and hygiene interventions that could reinforce correct hygiene practices at schools.

Table 4. 19: Supervision at the ablution facilities

School	Quintile	Supervision at ablution facilities
3	5	Prefects
5	5	Prefects must get toilet paper from groundsmen
6	5	No supervision
1	4	Groundsmen Teachers
4	4	Prefects Teachers
2	3	No supervision

Handwashing did not take place in groups, as indicated in the case with the Three Star Approach. The learners use the facilities as and when they need it. However, during the observation (indicated by the duration of the observation), the number of the students are reflected in Table 4.20 with the hand washing practices conducted. During the observation, the lack of soap was evident, whereas at one school (school 2), no water was available. For the duration of the surveys, during the first and second observation, there was only one child from school 1 who washed their hands with soap and water during the second observation, with the teacher providing them with soap.

The drinking water availability used in the analysis in Table 4.20 refers to the third criteria of the Two Star rating – access to low-cost, point-of-use water treatment in schools. In this study, all the schools have access to water, except for school 2, which has access to borehole water only. Although the borehole water should be compliant with SANS 241, which deals with the

quality of potable water (microbiological levels, chemicals, etc.), no documentation was available, or testing done to confirm if the water at school 2 meets the requirements.

Table 4. 20: Handwashing observations & drinking water availability during the sanitation audit

| School | First observation | | Second observation | | Drinking water is available at the school | |
| | Children wash their hands with soap after using the toilet | | Children wash their hands with soap after using the toilet | | | |
	Girls	Boys	Girls	Boys	Yes	No
1	1 x did not wash hands	2 x did not wash hands	No observation	1 x washed hands, with soap provided by the teacher	X	
2	No observation	1 x water only	No observation	1 x washed hands at standpipe outside toilets		X
3	No washing	1 x water only	1 x water only, rubbed dry against clothes	No observation	X	
4	1 x water only	4 x did not wash hands	No observation	4 x did not wash hands	X	
5	No observation	No observation	1 x water only	1 x water only 1 x did not wash hands	X	
6	No observations	1 x water only	No observations	No observations	X	

EHPs viewpoint on sanitation audits

During the semi-structured interview, 10 out of 15 EHPs stated that the sanitation audits are relevant (Appendix 21). The ones who considered it relevant commented and said that it assists with identifying maintenance requirements and adequate cleaning and preventing disease. They also mentioned that it is important to check the toilet ratios and to assist in maintaining the condition of schools. Yet they expressed their frustration with the lack of response to the information they gather. **EHP 9** stated the following: "*I think it is relevant. However, I find that the schools have limited funds as well. You know if you come there and do the audits, you find out maybe the toilet has been broken and you ask them what did they*

do? They did do like a requisition, and they send it in, but they still waiting. So, the audit I find, yes, it's valid cause sometimes when you come there you find maybe a tap that's not working and when you come there, it will be done much quicker, or they got a valid reason and you find out why. Or like on one of our schools there was an outbreak of diarrhoea, and we found out [that] because of the water saving they opened one tap. We told them, "Listen, no, no, the water is too little for the amount of kids," and the tap was in the sun. So, it is relevant for me. I believe yes, so when you go to schools, they do it. If they have a requisition for whatever was outstanding that's good enough. It's covered. The school is busy with … currently aware of it and they are busy with it" (Appendix 21).

There is little or no change after identifying problems; therefore, monitoring is done, but not the evaluation and implementation in correcting the problem". Schools have limited funds but also EHPs experience a lack of respect or value for EHPs amongst the schools, while other departments not taking the EHPs reporting serious according to **EHP 3** stating the grassroot challenges "*The thing is … I think, um, what makes it difficult is how our authority, you know, according to schools, how can we go about … because now you say this school is overpopulated [with] children, what is going to happen with that? You know, I think the EHPs feel more according to schools, authority is not that big. So, they feel more, "Okay, there is nothing that can be done." What can a principal do, are you going to tell them, "Okay, the toilets must be fixed?" Is it his thing to do it? It's not even his property. So where does that information go to? So what is the point of going to do inspections and you find that things [aren't] in place? What will happen to that information afterwards? So, I think that is more the concerns. So EHPs, I think, they feel they don't want to do much because there's nothing that's going to happen*" (Appendix 21).

Thus **EHP 3** provides the insight of why they see sanitation audits as relevant and need, however do not consider it effective.

Some EHPs were not familiar with school sanitation audits. The ones that were aware of it either did not conduct such assessments or complained about doing it. They stated that there is no "structure of accountability" and that "no legal aspect such as notice can be issued to schools. "EHPs can't help by just writing a letter, as it is always two steps forward and three steps back. As the groundsmen clean the toilets, the children vandalise the sanitation facilities, expressed by **EHP 11** who stated "*because we do the sanitation audits, you give it to the school and you tell them, "This is the amount of toilets that …", you forward it to the people because they say you must, so you forward it to the relevant people. The principal and EHPs help us to get these things, but we can't help you because what … we can maybe just forward*

it, write a letter. But the day after tomorrow, you maybe go again or over a month then only one or two toilets fixed. So, it's like two steps forward three steps back. (Afrikaans to English) Children also make a whole lotta mess with the whole thing. You know, that's the other thing about schools. Because at schools (Afrikaans to English), I can tell you that they've got cleaners and janitors working. You can see they really go in at certain times and they clean the toilets. Even if the toilet seat is off. But then the lady says but you can see we did clean there, show us, but the toilet isn't fixed. Now comes Sonny and Sonny realises that I don't have a toilet at home so I'm going to break the toilet and throw things around. You know you take photos, next time you come you see that there's a difference – it's cleaned nicely. The toilet seats are maybe replaced so that's how it goes" (Appendix 21)*.

The **EHP 14** express the question of the role of the WCED as the provincial department that is responsible for school buildings and why should EHPs conduct sanitation audits? EHPs would like to focus on education and relationship building. Regarding the relevance of the sanitation audits, **EHP 14** expresses that it is relevant, "*but I don't see the effectiveness of it".* When asked why not, EHP14 replies "b*ecause [when] we [are] doing the sanitation audit and you find, you know, bio types in the schools, but then you tell the school that it doesn't seem like the school takes it seriously because they still see us as "You're from the City; you're not government or WCED," so where WCED says your taps are broken, they make sure that by the end of the week those taps are fixed. But when City says [it] and we put it on that thing, then there's no implications for it. So, it's relevant, but it's not effective. Like you know, if we see something wrong with the school, we [are] not ensuring a notice based on that audit"* (Appendix 21).

Table 4.21 provides insight into their views on the relevance of sanitation audits, where the bullets are the comments from the various respondents.

Table 4. 21: EHPs opinion on sanitation audits

Yes, it is relevant	No, it is not relevant
• Assist with identifying maintenance requirements and adequate cleaning. • EHP questioning if they have the authority to enter schools, while being frustrated about gathering information via the audit, <u>yet nothing is done with it</u>.	• Not familiar with the school sanitation audits. • <u>No structure of accountability</u> and general complaints of doing the audit. • EHPs would like to focus on education and relationship building. • Do not conduct sanitation audits.

• There is no change after identifying problems; therefore, monitoring is done, but not the evaluation and implementation in correcting the problem. • An audit is for the prevention of disease, linked to hygiene education; however, what enforcement and authority do EHPs have in the schools except regarding the feeding schemes and tuck shop facilities? • Link hygiene and sanitation audit in interventions at schools. • Schools have limited funds. • Important to check the toilet ratios and to assist in maintaining the condition of schools. • Ensuring the sanitation facilities are compliant is important to prevent the spread of disease, therefore ensuring good and clean conditions within the facility, but the schools do not respect or value EHPs' reports. • Sanitation audits are not effective. • Sanitation audits are kept on record, but nothing is implemented or changed to ensure compliance.	• Hygiene plays a fundamental role, especially within the vulnerable groups; however, do not do sanitation audits in my area. • What is the role of WCED as they were the responsible department for building the school, where principals report the situation – why should EHPs conduct sanitation audits? • EHPs can't help by just writing a letter, as it is always two steps forward and three steps back. As the groundsmen clean the toilets, the children vandalise the sanitation facilities. • No legal aspect such as notice can be issued to schools.

4.6.2. Environmental assessment

In the case of South Africa, schools should adhere to the National Environmental Health Norms and Standards, in addition to the policy requirements of the ISHP. Table 4.22 represents the environmental assessment results, which are based on the observations during the data collection stage of the research. The list of categories used in Table 4.22 was obtained from the ISHP, which was augmented by the National Environmental Health Norms and Standards, with the foundation framework being the Three Star Approach (i.e., becoming the reference tool). The template for the categories and legislation is displayed in Appendix 8: Environmental assessment.

Each category with its sub-categories was provided with a three-level rating scale, where 0 (zero) represents non-compliant, 1 represents partially compliant and 2 represents compliant. The individual row and column scores were summated in each of the categories and then

divided by the maximum potential scores (e.g., the 10 variables with a maximum score of 2 per variable produced a column total of 20 per school). For the row total, the number of schools that participated multiplied by the maximum score of 2 per variable produced a row maximum of 12. The row and column percentages give an indication of each school's overall performance regarding the environmental assessment and the overall status of the variables, respectively, giving an indication of the gaps. Therefore, each of the categories has the same weighting and provides a complete total of 20 per school. Accordingly, in Table 4.22, all the schools achieved above 50% for their environmental assessment, whereas schools 4 and 5 scored 60%.

The areas that require improvement are waste disposal, pest control and adequate water and sanitation. Table 4.14 indicates that the ratios of the toilet and handwash basins at the schools are inadequate. Furthermore, the food safety of the school is assessed. There is no Certificate of Acceptability present at the tuckshops and for the food schemes, with little to no food hygiene training conducted. Lastly, the designated smoking area for teachers is not according to the Tobacco Products Control Act, 1993 (Act No. 83 of 1993) stated in the National Environmental Health Norms and Standards.

Table 4. 22: Environmental assessment of all surveyed schools

	School	1	2	3	4	5	6		
	Quintiles	4	3	5	4	5	5		
	Variables	Schools' scoring						Total	Per cent
1	First aid	2	2	2	2	2	2	12	10,0
2	Sickbay	1	1	2	1	0	0	5	41,7
3	Adequate water & sanitation part 1	1	1	1	1	1	1	6	50,0
4	Adequate water & sanitation part 2	1	1	1	1	1	1	6	50,0
5	Waste disposal	1	1	1	1	1	1	6	50,0
6	Physical safety	1	1	1	2	2	2	9	75,0
7	Food safety	1	0	0	0	1	1	3	25,0
8	Vector control	1	1	1	1	1	1	6	50,0
9	Ventilation	2	2	2	2	2	2	12	100,0
10	Smoking area	0	1	0	1	1	0	3	25,0
	Total (maximum 20)	11	11	11	12	12	11	68	56,7

	%	55,0	55,0	55,0	60,0	60,0	55,0	56,7	

Before and after photos of ablution facilities, sick rooms and kitchens are displayed below and is organised according to what was documented at each school. The aim is to compare the environmental assessments, while using the photographic gestalt, before and after the EHPs health and hygiene intervention took place, to assess the impact and effectiveness of the intervention. This is ensuring a holistic evaluation, with the reference tool being used, considering the Three Star Approach, Environmental Health Norms and Standards and the ISHP.

4.6.2.1 School 1

The images below, where figures 4.18 illustrate handwash basins and the lack of regular cleaning. Also, there is no evidence of soap being available at the time of the observations. These photographs confirm the responses from the Grade 7 students and their teachers about the lack of soap in the ablution facilities.

Figure 4. 18: Handwash basin

Figures 4.19 and 4.20 show that there was no change in the structural condition of the toilets. In both cases, the toilets did not have a seat. However, a menstrual bin was present, with signs that the liners were being replaced.

The groundsmen for school 1 indicated that they "do not have time to get to maintenance issues" because of the preventative measures of supervising the ablution facilities during the breaks to ensure vandalism does not occur. This could explain why the toilet seats had not been repaired even after a month.

Figure 4. 19: Toilet (onset)

Figure 4. 20: Toilet (end)

Figures 4.21 and 4.22 show the kitchen where food is prepared for the feeding scheme. Foreign objects, such as a wooden stick, were present in the kitchen. It seems if the stick is used in the preparation of the food (to stir the food). Food should be prepared in accordance with section 6 of regulations related to the DoH that governs general hygiene requirements for food premises, the transport of food and related matters (South Africa, Department of Health (DoH), 2018) and which addresses standards and requirements for facilities where food is prepared. Wooden or porous equipment is not allowed in the kitchen. In addition, during the previous visit to the school, the food handler was not wearing a hair net correctly and they were also wearing earrings. The food handler did not wear closed shoes, as prescribed by Regulation 638 (Section 8 provides the standards and requirements for protective clothing). The practices observed and depicted in the photographs show the need for training, and there was also no certificate of acceptability available.

Figure 4. 21: Kitchen (onset)

Figure 4. 22: Kitchen (end)

Figure 4.23 shows the sickbay bed, which is in a storeroom with a gas cylinder, feeding scheme ingredients and other items. The sickbay bed is not waterproof and has no access to running water; however, it did have a first aid kit, as required by the National Environmental Health Norms and Standards. The sickbay area is located far from the reception area.

Figure 4.24 shows the school grounds or sports fields that are currently not in use, because there is no fence around this part of the school. In addition, in the right bottom corner, one can see a drain that has a tree stump placed in it as a form of safety measure to prevent children or staff from falling into the manhole. Both these situations did not change during the last data collection at the school.

Figure 4. 23: Sickbay

Figure 4. 24: School field

4.6.2.2. School 2

Among all of the schools in the research study, school 2, being the lowest quintile (quintile 3) of the research group, was the only school that had colourful signage on the walls promoting handwashing. However, there was no soap available, and the missing basin was not replaced during the month between the observations (Figures 4.25).

Figure 4. 25: Handwash Basin

Figure 4.26 shows the cistern lids partially off. The groundsman stated that the school is awaiting new lids as they were broken and removed, rather than leaving them on. There was little to no change from the onset to the end for the ablution facilities, seeing in figure 4.27.

Figure 4. 26: Toilet (onset)   **Figure 4. 27: Toilet (end)**
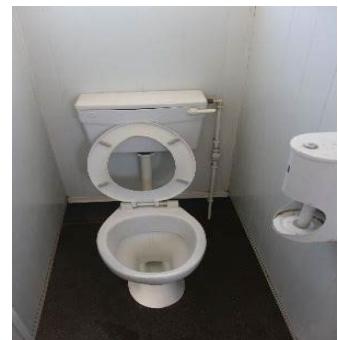
The toilets were in good condition; however, there was no toilet paper present during both the onset and last data collection. The groundsman stated that the toilet paper must be given by a teacher, or one needs to request this from the reception.

In the foreground of Figure 4.28, underneath the cloths, is a gas cylinder, while in the background the cleaning material and utensils are stored directly on the floor. The conditions displayed in Figure 4.28 show that housekeeping is a challenge at this premises. In accordance with building regulations (Part T), a gas cylinder should be stored according to SANS 10087-2, which should be preferably in the open air on a concrete or load-bearing surface. The utensils and cleaning materials are not supposed to be stored directly on the floor or in the kitchen – proper storage facilities should be provided. There was no accessibility to the kitchen during the second visit.

Figure 4. 28: Kitchen

There was no allocated sickbay area on the school's premises. Instead, during the data collection, the school said that they use the reception and principal's office as a sickbay area, where a wooden bench is provided for the sick to lie on.

4.6.2.3. School 3

With recollection to the EHP's intervention, the intervention at this school was based on the sanitation audit that was done prior to the intervention. It focused on toilet hygiene, owing to the EHP's findings and observations during the sanitation audit.

In Figures 4.29, the missing pipes result in wet floors, creating a slippery floor and contributing to unsafe conditions for students. However, the old system of piping into the gutter area leads to the littering of toilet paper here (see Figures 4.29). Consequently, water and toilet paper are being used for recreational purposes (see Figures 4.30, with toilet paper on the ceiling of the ablution facilities, with the groundsmen of the school stating that the children have no respect for the ablution facilities).

Figure 4. 29: Handwash basin piping

Figure 4. 30: Toilet paper on ceiling

In Figure 4.31, the state of the handwash basin area at the onset was poor, with dirty taps and basins, with piping of the handwash basins not leading into the gutter. In addition, there was no evidence of soap being present at the handwash basins and no indication of soap lather in the basins, thus one can conclude that no handwashing is taking place.

Figure 4. 31: Handwash basin (onset)

Figures 4.32 and 4.33 show no change in the missing toilet seats and lids, with a stain across the lid of the menstrual bin, which has not been cleaned. The hygiene of the toilets did not improve or decline.
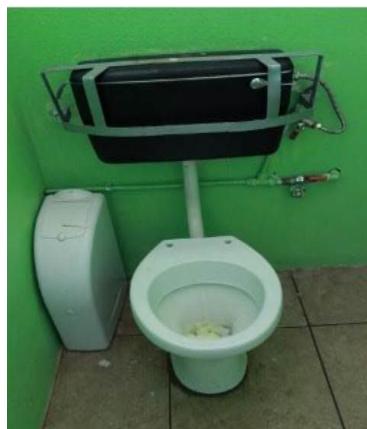
Figure 4. 32: Toilet (onset)

Figure 4. 33: Toilet (end)

Figure 4.34 and 4.35 provides evidence (during the second sanitation audit a month later) of faeces on the wall of a toilet cubicle. Figures 4.32, 4.33 and 4.34 display a lack of infrastructure – no toilet seats or covers and a likely lack of toilet hygiene by the Grade 7 students. The visual evidence of the ablution facilities, together with the expressed opinion of the groundsmen, seems to indicate that the students have no respect for the toilets. One can conclude that there is a lack of toilet hygiene from the Grade 7 students. This school is the only school that had a sanitation audit conducted beforehand; hence, the reason for focusing on toilet hygiene during the intervention.

Figure 4. 34: Faeces-stained toilet wall

Figure 4. 35: Zoomed faeces-stained wall

External sewerage outlet

Further, the outside piping (Figure 4.36) of the toilet facilities was open; this is direct sewerage piping that is exposed. The worst-case scenario is that if there was an overflow of sewerage due to a block in the system, this would affect the school's playground area, creating a health

nuisance in the school and conditions for a diarrhoea outbreak, with favourable conditions for pests such as flies.

Figure 4. 36: Open sewerage outlet piping

Sickbay

Figure 4.37 displays the sickbay area, which is close to reception. Although the bed is covered, there is no waterproof mattress; however, it does have access to water and a first aid box is present.

Figure 4. 37: Sickbay

Kitchen

Figures 4.38 and 4.39 show the kitchen where the food is prepared for the feeding scheme. In the foreground is a gas cylinder covered with a cloth, with a wooden table where the food is prepared and a sink in the background with only cold running water. Figure 4.39 depicts the same kitchen a month later during the follow-up observation, showing cleaning materials stored on the wooden table where food is prepared, while a wooden spoon is visible in the sink. In accordance with section 6 of the Regulations Governing General Hygiene Requirements for Food Premises, the Transport of Food and Related Matters (RSA, 2018), porous equipment is not permitted in the kitchen, therefore the wooden table and wooden spoon should not be in use. Furthermore, in Figures 4.38 and 4.39, there is evidence of water

damage above the sink area: dirty walls and peeling paint indicate non-compliance with section 5 of the above-mentioned regulations. It was clear that no training had taken place and there was no certificate of acceptability, clearly evident from the photographs.

Figure 4. 38: Kitchen (onset)

Figure 4. 39: Kitchen (end)

4.6.2.4. School 4

The handwash basins in Figure 4.40 were in an average state; however, the majority of the taps were not working. The reason for only one tap having water was due to the drought that occurred in the Western Cape in 2018 just prior to the research. Consequently, only one handwash basin was available per ablution facility. The ratios according to the National Environmental Health Norms and Standards were not met.

Figure 4. 40: Handwash basins

However, observing the urinals in the boys' ablution facilities (Figure 4.41 and 4.42), the ablution facility went from good to bad, with blockages observed in the second data collection. The groundsmen stated that two urinals were blocked and one was broken, resulting in an unhygienic ablution facility.

Figure 4. 41: Urinal (onset)

Figure 4. 42: Urinal (end)

General hygiene was lacking during the second data collection, with no structural change as seen in the images in Figures 4.43 and 4.55: a cistern lid was still missing, with the toilet seat not being clean and no toilet paper during the onset and last data collection. The lack of toilet paper increases bad hygiene practices; in addition, no soap was available for handwashing.

Figure 4. 43: Toilet (onset)
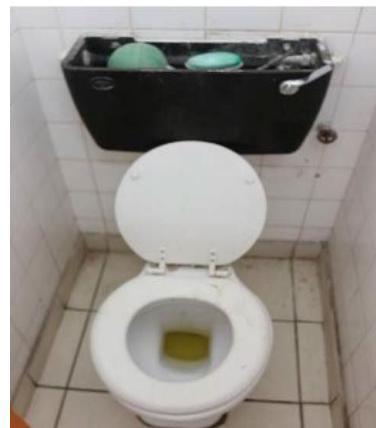
Figure 4. 44: Toilet (end)

A general lack of respect for the groundsmen and the expectant mindset of the Grade 7 students – of not respecting toilets – has led to the groundsmen having to clean more regularly and needing to monitor the ablution facilities. There appears to be no sense of responsibility instilled in the Grade 7 students and students throughout the school. Figure 4.45 clearly displays this lack of respect: toilet paper on the floor and wet floors. The attitude and behaviours towards the ablution facilities are that the groundsmen will clean up. For this reason, the groundsmen who monitor the ablution facilities, with the aid of prefects, cannot attend to the actual maintenance issues.

Figure 4. 45: Toilet floor (end)

The hole in the ceiling shown in Figures 4.46 and 4.47 had not been repaired by the second data collection; in addition, toilet paper was evident on the ceiling. The groundsmen informed the researcher that the students wet toilet paper and throw it onto the ceiling. This waste resources, vandalises the ablution facilities and creates unhygienic conditions.

Figure 4. 46: Toilet ceiling (onset)   **Figure 4. 47: Toilet ceiling (end)**

Figures 4.48 and 4.49 showcase the kitchen at the school where the food is made for the tuck shop. The wooden table in Figure 4.48 was present in the kitchen. In accordance with Regulations Governing General Hygiene Requirements for Food Premises, the Transport of Food and Related Matters (South Africa, Department of Health (DoH), 2018), section 6 being standards and requirements for the facilities on food premises, wooden or porous equipment is not allowed in the kitchen. Additionally, the dirty wet walls and paint peeling on the walls under the sink are all non-compliance in relation to section 5 being the standards and requirements for food premise—the evidence of no training and lack of a certificate of acceptability evident through the pictures below.

Figure 4. 48: Tuck shop (onset)

Figure 4. 49: Tuck shop (end)

Figure 4.50 displays the sickbay area, which is close to reception. The bed is covered, but there is no waterproof mattress; however, it does have access to water and a first aid box is available.

Figure 4. 50: Sickbay area

4.6.2.5. School 5

Figures 4.51 and 4.52 reveal that the ablution facilities are currently being used as a storage room, with sports equipment and desks in the area. Most of the taps were removed during the drought in 2018, as stated above in connection with School 4. The basins have water residue, but there is no evidence that soap is being used for handwashing.

Figure 4. 51: Handwash basin

Figure 4. 52: Handwash basin

The urinals in Figures 4.53 and 4.54 were out of order. During the month between the data collections, the groundsmen were not able to repair them. The tables that are used in classrooms are being used at the urinal to show it is out of order, which indicates unhygienic practices. The added items could possibly encourage students to linger at the ablution facilities; this could result in an additional problem of children playing and eating in the ablution facility, as mentioned by the groundsmen.

Figure 4. 53: Urinal
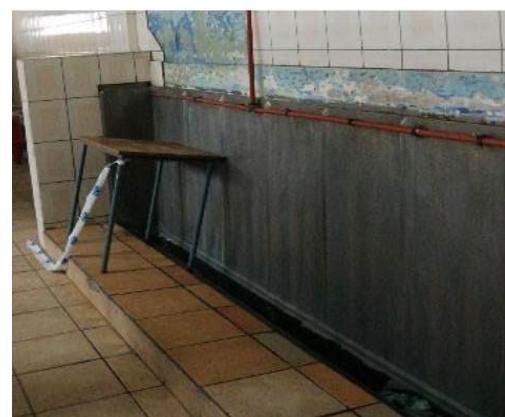
Figure 4. 54: Urinal

With the evidence of water being used in the handwash basin, there was further evidence that the students have been wetting toilet paper and throwing it onto the ceiling (Figures 4.55). The groundsmen informed the researcher that this is indeed what the students do. As indicated above, this behaviour wastes resources, vandalises the ablution facilities and creates unhygienic conditions. This explains the reasoning for why toilet paper is provided only from the teachers or reception – to prevent water being wasted and students vandalising the ablution facilities.

Figure 4. 55: Toilet ceiling (onset)

Figures 4.56 below shows a dirty red chair on the toilet, meaning the toilet is out of order. A month later, it was still out of order.

Figure 4. 56: Toilet

Figures 4.57, 4.58 and 4.59 showcase the kitchen where the food is prepared for the feeding scheme. Notice the wooden spoon in Figure 4.59, behind the tap covered with a plastic sleeve, was present in the kitchen. In accordance with Regulation 638, with section 6 listing standards and requirements for the facilities on food premises, wooden or porous equipment is not allowed in the kitchen. In addition, there is an out-of-order tap, mats on the floor and a dirty

wall under the gas stove. This shows the school is not complying with section 6 of the standards and requirements for food premises for housekeeping and maintenance. As with the other schools, there was also no evidence of training taking place and no certificate of acceptability, which can be observed in the images. The out-of-order tap reveals that there is no running water in the kitchen area, which is required for washing hands and cleaning surfaces and equipment.

Figure 4. 57: Kitchen (onset)

Figure 4. 58: Kitchen (end)

Figure 4. 59: Close-up of kitchen tap

4.6.2.6. School 6

In Figures 4.60 taps were changed to the press taps to limit water use after the drought in 2018. The handwash basins were in a good condition and hygienic; however, there was no soap present at the basins.

Figure 4. 60: Handwash basin

With the exception of school 2, the sign to wash hands was present in both the girls' and boys' bathrooms (Figures 4.61). Nevertheless, there was no soap to conduct adequate handwashing practices with soap and water after using the toilet.

Figure 4. 61: Hand wash sign

There was no toilet paper seen in both Figure 4.62 at the school, but the general hygiene of this specific toilet was adequate.

Figure 4. 62: Toilet

In addition, there was damage to the ceiling, which had not been repaired by the second visit, as can be seen in Figures 4.63 and 4.64, with a hole and a cracked line in the ceiling.

Figure 4. 63: Toilet ceiling (onset)   **Figure 4. 64: Toilet ceiling (end)**

This outside tap displayed in Figures 4.65 and 4.66 is the designated drinking water for the school; however, the wall and surrounding area is tainted with a green colour, which one can assume to be a fungus or mould of some kind. This therefore likely contaminates the area where clean water is to be consumed. There was no change between the onset and last data collection.

Figure 4. 65: Drinking tap   **Figure 4. 66: Closer view of Drinking tap**

Figures 4.67 show the condition of the kitchen where food is prepared for the tuck shop. Note the wooden table in Figure 4.67 and the cardboard boxes in Figures 4.67 present in the kitchen. In accordance with Regulation 638, section 6, wooden or porous equipment is not permitted in a kitchen. The condition of the facility and photographs taken indicate there is a

lack of housekeeping, which is important to ensure good hygiene. No training had taken place and there was no certificate of acceptability.

Figure 4. 67: Kitchen

According to the Environmental Health By-Law 2003 (City of Cape Town, 2003), part 1, section 2, the health hazards observed in Figures 4.68 and 4.69 contribute to pests being harboured in the overgrown grass and objectionable material. The long grass with dry vegetation is also a fire hazard.

Figure 4. 68: Health hazard   **Figure 4. 69: Health hazards during the second visit**

The photographic gestalt provides visual evidence of the current conditions on the schools' premises, and the current conditions can and may result in diarrhoea and hepatitis A. The worst-case scenario would be food poisoning from the feeding scheme kitchen because of a lack of training in food safety and hygiene.

The photographic gestalt also provides photographic evidence in supporting Table 4.15 (speaking to the general state of hygiene conditions of the ablution facilities) and table 4.7 (teachers opinion of the hygiene conditions), alongside table 4.14 (relating to the infrastructure ratio's). Lastly figure 4.17 (the availability of soap, water and menstrual facilities) provides evidence.

Additional themes across the schools include vandalism and a lack of respect for ablution facilities, possibly stemming from the way children are brought up in the community. The Three Star Approach, and the support of the community is critical in assisting schools with behaviour change and taking ownership of sanitation and hygiene practices.

Researcher

Photographs were taken during the audit and an assessment for photographic gestalt for example the image of the field at School 1 depicted in Figure 4.70.

Figure 4. 70: School 1 field photographed whilst conducting the environmental assessment

School 4 was the only school that provided constructive questions and answers after the intervention, which provided a type of measuring tool for knowledge transfer.

4.7. Conclusion

According to the Three Star Approach, the school, teachers, children and community should be involved in hygiene practices, cleaning and assisting with the infrastructure requirements to aid a school in achieving Three Stars. The sentiment of the Three Star Approach is shared in principle in the ISHP and the Environmental Health Norms and Standards in South Africa. However, the school and the EHPs, not to mention other departments, are all working in silos

– there is no collaboration between any of the stakeholders, starting with the students, teachers, and groundsmen at the schools. Consequently, through the analysis of data, the current health and hygiene interventions conducted by the EHPs are not effective.

The following themes are espoused and will be discussed in the final chapter of this thesis. By grouping the themes according to the various stakeholders in the study, starting with the school, it is clear that there is a general lack of infrastructure among all of the schools. This relates to the number of toilets and handwash basins, including access to soap for handwashing. There is a general lack of handwashing practices by Grade 7 students, with no supervision of handwashing by teachers and/or groundsmen. Where supervision is present, it is focused on vandalism and bullying in the toilets. In addition, a lack of respect towards the ablution facilities among the schools is prevalent, emanating from the students themselves that vandalises the facilities. A lack of sanitation and environmental assessments conducted by EHPs was also observed, together with a lack of knowledge of legislation and policy that aims to assist with interventions. There was inadequate use of the monitoring and evaluation tool. Through the various data collection and analysis during this chapter, it is evident that data triangulation shows that the findings from the photographic gestalt (images) confirms the findings of the sanitation audit and environmental assessment.

The behaviour questions were not used during this data analysis as a result of time constraints of the researcher; nevertheless, this would not have changed the outcome of the research. However, it would have provided additional information from a behavioural aspect, which would aid in the innovative solutions mentioned by EHPs with a view to changing behaviour.

In conclusion as seen in the data analysis, that none of the schools within the study achieve a One star according to the UNICEF Three Star Approach. This is highlighting the importance of the implementation of the ISHP and for the education and health department to work together to ensure the students have access to all WASH facilities and informed collaborative health and hygiene interventions to focus on the relevant issues at the particular school.

CHAPTER 5: Discussion

It is a legal obligation for EHPs to conduct school hygiene interventions. Yet, information on the effectiveness of such interventions and intervention strategies indicate that the official performance monitoring processes focus primarily on the number of interventions conducted. In other words, it is all about number crunching. This is expressed in EHP 4's response: *"We share the target with the health promotions officer, which is Z, and what we were given was 20, um, for the year, financial year, and so we split it between our office on Lakeside but, um, our office on Lakeside is very adamant that that's not their job. Primary school, they happy to work in ECDs, um, but as far as going to schools it's not them"* (Appendix 13). The experiential effectiveness of the interventions, whether compliance inspections or behaviour changing programmes, is seldom assessed (Zurc & Laaksonen, 2023).

However, a good grasp of the structure and impact of educational outcomes of WASH interventions in schools is important as it supports resource allocation; improve effective design and identify further opportunities for implementation. Importantly it assists public officials and other role players, to get a better understanding of the role of students as change agents in the broader community, the theory of change on which the programme is based and intervention fidelity (McMichael, 2019).

Zurc & Laaksonen (2023) identify the following components of school-based interventions as it relates to positive or partial effectiveness and the potential for unintended reverse effects. The effectiveness of interventions depends on various structural elements including a structured programme; providers; training for the providers; targeted participants; organised community involvement and contextual factors e.g., policy, organisation capacity, collaboration with local communities and stakeholders. Such a multi-component intervention tends to be more effective than single-component interventions. However, they point out that inadequate self-reported data on long-term follow-up effects, can negatively affect the programme. Therefore, they conclude, the factors and the impact thereof should be investigated "more systematically and comprehensively" to understand which structural components affect effectively and ultimately the health and lives of children (Zurc & Laaksonen, 2023).

This study shifted the focus from the number of interventions to gauging qualitative or experiential measures as reflected in the views of those people involved in the interventions – EHPs, groundsmen, teachers and students. This is done by applying the criteria of the Three

Star Approach for WASH in schools to classify interventions as a way to establish the level of effectiveness of the primary school health and hygiene interventions, conducted by Environmental Health Practitioners (EHPs) in specific schools in the Cape Metropole area.

To explore these questions the researcher interacted with the six different role players involved in the interventions at schools using different research tools. However, the Environmental health practitioners being the corner stone as they were interrogated on the selection of how and where to conduct primary school hygiene interventions; their planning process; their knowledge and understanding of their role in school health promotion. Furthermore, their perspective on school monitoring and evaluation and effective ways to change behaviour. The researcher also observed them conducting the health and hygiene interventions, sanitation audits and environmental assessments. Reflective and field notes and photographs provided data on the researcher's observations and impressions.

The results of the data collection are discussed in Chapter 4. In this chapter the data is analysed and discussed in relation to the four objectives set for the study namely to establish:
1) How EHPs are informed to conduct the health and hygiene intervention at their school.
2) How EHPs conduct their school's hygiene interventions.
3) Whether the EHPs' monitoring and evaluation methods are effective.
4) The overall effectiveness of the EHPs' interventions.

The data analysis revealed four themes indicating that EHPs demonstrated:
1) A lack of knowledge of legislation and policy.
2) A lack of infrastructure at the primary schools.
3) A lack of strategy for health and hygiene interventions.
4) The need for interdepartmental relationships to be formed.
5) Appropriate training on the evaluation and monitoring (COMBI) tool.

Each objective is discussed separately and linked to insights revealed by the findings discussed in previous chapter.

5.1. Objective 1: How EHPs are informed to conduct a health and hygiene intervention at a school

Effective service delivery, according to Agenbag and colleagues (2022), is dependent on setting clear-cut goals and directives or mandate that establishes levels of authority and functions that, in this case EHPs, are obliged to do and achieve. In the public service, such a mandate encapsulates legislation and regulations from national and provincial levels to local authorities.

Performing school interventions is a mandatory function underpinned by the overall objectives set by the Municipal Strategic Plan and linked to EHPs' KPIs and allocated targets. These need to be achieved by each staff member in each financial year (City of Cape Town, 2017). Furthermore, the National Health Promotion Policy and Strategy 2015–2019 make specific reference to the role of legislation and policy in effective EH policy implementation and health promotion strategy (South Africa: Department of Health (DoH), 2014. The interrogation of EHPs knowledge and understanding of the relevant policies and legislation that should inform their interventions, was imperative to establish their mandate cognition and the effectiveness of school health and hygiene interventions.

The information revealed by the data pointed to confusion among EHPs about whether it is their responsibility and if so what their knowledge and understanding of their role in school health promotion, is. Eighty per cent of the EHP participants were not aware of the relevant legislation that guides health promotion, whereas just more than half (53,3%) of the EHPs were aware of the EH event Standard Operating Procedure (SOP) written by the CoCT EH Health Promotional Team and approved by the EH management structure. Regarding other functions besides health and hygiene promotion to be performed at schools, 29% of the respondents mentioned kitchen inspections as a mandatory function. While 12 % listed norms and standards inspections; other functions mentioned were 1) performing interventions at schools and 2) building regulations (6% or n=1), respectively. However, 18% were not aware of these obligations.

Twelve per cent highlighted sanitation audits as being important (see Appendix 21). However, this particular function can hinder organising school health and hygiene interventions. *EHP 4* stated that *"I think it's very relevant. I think it has a place, but it ends there, which is the problem. I go in, I evaluate, I make notes, this is what needs to change, and I leave it with the principal and nothing changes. So, it's one thing being audited, but when you don't have the infrastructure or the means to actually repair things and get things right, then why am I coming*

and doing the same thing and where's the enforcement? What's the next step? Because I'm also trying to build a relationship with the school here, [but they] want me to serve a notice now, but I must come in to do education – so it's conflicting, yeah, because [the] EHP must be everything. That's the problem. Define what you want us to do in school. Do you want us to audit? Then that's one role. Do you want us to educate?".

Confusion about the required number of interventions they have to perform at schools, was also revealed by the data from **EHP 1** stating that *"no PDR for schools, HPO is responsible for this target)"* (Appendix 13), to **EHP 7** stating the same*: "I sat with my head last year and she said school projects is the responsibility of the health promotion officer. So, if she will need our assistance, then she will call on us but we don't do any schools."* (Appendix 13), and **EHP 15** using the operative word 'think', see statement: *"For schools, each and every quarter, um, I think with Silvertown it changed. So, this quarter, it could be Silvertown so, for instance, three people in this quarter, it will be three people. There is a timetable, so someone takes care of that, the schools' portfolio. So currently we have like three people that need to produce for the quarter. So, it doesn't actually matter when you do it in the quarter, but as long as we do it. So, they would say X for January and February, but it doesn't matter when you actually do it as long as we do it in the quarter"* (Appendix 13).

Analysing the data, highlights a number of reasons why there exists a lack of mandate cognisance or clarity about what legislation says about EHPs' obligations towards health and hygiene interventions of school children. One reason is that there is no specific PDR in the metropolitan municipality despite performing school interventions being a mandatory function linked to EHPs' KPIs and allocated targets. As a result, the EHPs offered several answers to the question how many visits they are supposed to make at schools. This ranged from admitting about not knowing the exact number; explaining that the number is set by the HPO; stating that they are supposed to do 10 interventions or a school per month or every two months or per quarter.

Key performance indicators are tools used to measure the success of an organisation and therefore have to be fit for purpose, specific, measurable, achievable, realistic and attainable and time-bound. Furthermore, these indicators should be broadly recognised and clearly communicated giving a clear direction for action planning and implementation to achieve targets (Ishaq Bhatti, et al., 2013; Ogbeiwi, 2017). This help align staff actions to the organisation's goals and improves their performance, ownership and empowerment (Parameter, 2015). Participating EHPs' responses indicate in the above quotes of EHP 1, 7

and 15 that the demarcation of the KPIs is not clear or they have not properly streamlined both the information and process to the entire metropole.

Performing school health and hygiene interventions are performed over and above an EHP's routine workload, such health surveillance of premises (i.e., food premises, ECD and funeral parlour inspections), prevention and control of communicable disease, vector control, medical waste management as well as the ad hoc municipal health functions within their service area. It requires additional time to plan, research and administer.

5.2. Objective 2: To determine how EHPs conduct their school's hygiene interventions

An effective and high-quality intervention follows the general progression from initiating the project, setting objectives, developing tasks to achieve the objectives, allocating resources and engaging stakeholders, creating a timeline, implementing it and then assessing it for impact (Wubbolding, 2002).

Planning means to determine timelines, deliverables, budgets, the resources required to achieve the project goals and responsibilities. Starting with reviewing literature, selecting theories, collecting data and finding evidence-based "best knowledge that incorporates theoretical and empirical support and engages key stakeholders and community members or patients in the planning process results in interventions that are more effective" (Fernandez, et al., 2019; Zurc & Laaksonen, 2023). However, collating and project managing all this information is a complicated activity "for even well-trained health promotion practitioners" (Fernandez et al., 2019).

From the participants' responses it is clear that no formal or standardised planning process for school health and hygiene interventions exist. Many develop their own ways of planning. The process includes some or all of the following actions: brainstorming ideas with the office; sourcing material; developing a budget; arranging a meeting with the office to plan the intervention; requesting permission from the schools to host the intervention and other activities include requesting and obtaining resources. *EHP 6* explains their process as follows: "*So basically, we form the team and then liaise with the school and inform the principal and then if consent would be needed from the parents – consents are given, and then, yeah, we do our planning and how we* (will) *tackle the task and we share responsibilities, yeah, and that's all."* According to *EHP 6* "… the *main thing is planning of projects and I am of the opinion that I don't plan and inform the staff, so whatever planning I do, I do it jointly with the staff. I also do a lot of the logistics; however, if it is not in my area then that area is the EHP's*

responsibility" (Appendix 15). **EHP 14** explains that *"there is the pre-planning, then there's details of the project itself: we identify the needs and identify the challenges and you have an outcome. Then the last part of the tool would be your review project. What were your shortages, what were your challenges, what were your needs, did you reach your outcome, did you meet your goals, your target? That kind of thing"* (Appendix 22).

But planning is not the same as having a strategy. A strategy refers to integrated decisions to achieve the overall outcome while planning is done within the wider scope and aims of the strategy. According to Freedman (2013 in Maleka, 2014) "it is about employing whatever resources are available to achieve the best outcome in situations that are both dynamic and contested." The biggest challenge according to the EHPs is the lack of resources. **EHP 10** states: *"Like the equipment, the material because these days you just go there without the material. It is our main challenge. You find that in the diarrhoea season, maybe at that particular moment we don't have handwashing material, um, we don't have something that speaks about diarrhoea. So, it is a challenge"* (Appendix 22 and figure 4.5). In addition to this EHPs are not aware of environmental health SOP for events or various legislation to provide them with the strategy to assist in planning and conducting their intervention: **EHP 3** replies: *"SOP for events, no, there was only policy and the by-law, but not the SOP. Is there an SOP on the events? (laughs)"* (Appendix 16).

5.2.1. Identifying where to implement interventions

Regarding how they go about selecting what school to target, again decisions are made erratically, and depends on the EHP's initiative. Some visit only primary schools, others both primary and secondary schools. **EHP 10** explains that their projects *"focus on the primary schools, and I would just do any school in my area. Like I have three, but I make sure at the end of the financial year I visited all my schools in terms of having a project. So, I just choose the school" (Appendix 14)*.

When asking the EHPs what informed their selection of schools to visit and conduct interventions, again a variety of answers were received. While the majority of the EHPs' said they responded to clinical information obtained from the school nurse, some said it is the outcome of a sanitation audit that they had conducted. Data also showed that EHPs select schools primarily in the indigent areas and marginalised and vulnerable groups as well as farm schools. In the case of interventions based on sanitation audits, health and hygiene interventions are planned in consultation with the school nurse or persons selected by the

EHP. In other cases, the intervention is organised after a service or someone from the school had asked for it.

5.2.2. Planning interventions

Although all participants except one, stated that they follow a planning process, the data reveals that there is no formal or standardised planning process in place besides the PDR. The planning process they referred to include activities such as sourcing materials (28,6%, n = 8); arranging a planning meeting (21,4%, n = 6); requesting permission from the schools (14,3%, n = 4) and brainstorming ideas for the intervention. **EHP 6** explains that they "*form the team and then liaise with the school and inform the principal and then if consent would be needed from the parents – consents are given, and then, yeah, we do our planning and how we gonna tackle the task and we share responsibilities, yeah, and that's all*" (Appendix 15).

> **EHP 7**: "*So the main thing is planning of projects and I am of the opinion that I don't plan and inform the staff, so whatever planning I do, I do it jointly with the staff. I also do a lot of the logistics; however, if it is not in my area then that area is the EHP's responsibility.*" (Appendix 15)
>
> **EHP 14:** "*There is the pre-planning, then there's details of the project itself: we identify the needs and identify the challenges and you have an outcome. Then the last part of the tool would be your review project. What were your shortages, what were your challenges, what were your needs, did you reach your outcome, did you meet your goals, your target? That kind of thing.*" (Appendix 15)

The planning tool used by the CoCT is called *Plan Do Review* (PDR). This require all staff members to provide the allocated targets (KPIs) that need to be achieved by each staff member in each financial year. The PDR supports achieving the overall objectives set by the Municipal Strategic Plan. With the provided targets, the EHPs need to ensure it is reached at the end of the financial year.

During the semi-structured interviews with the EHPs, the question about the school project PDR targets indicated that just more than half (n = 8 – 53.3%) of the EHP participants were cognisant of the PDR, whereas 13% (n = 2) were not aware of the PDR target or the year (Appendix 13). Admittedly, the two EHPs who were unaware, were both community service year EHPs who were appointed on a one-year contract. However, the semi-structured interviews not only highlight the lack of standardisation of planning, but the inadequate use of the COMBI for monitoring and evaluation. This aspect is discussed in the next section.

5.2.3. Components of the intervention

The quality and accessibility of health and hygiene intervention presentation can make all the difference. (Klaic, et al., 2022; Zurc & Laaksonen, 2023). There is some evidence that the number and type of behaviour change techniques used in interventions is important in increasing intervention success (Hoyle, et al., 2023).

This particular structural element of an intervention. (Mertens, et al., 2020) distinguish three types of components of an intervention: 1) what is learnt or content; 2) how learning takes place (instructional or techniques and methods of information delivery used by the intervention facilitator and 3) the intervention set-up or structural components that might impact results. An example of the structural components is the mode of presentation, the number of sessions and effectiveness (i.e., transfer of knowledge and change in behaviour). While such components greatly contribute to effectiveness or not of an intervention, a lack of time and resources to invest hinders implementation. (Mertens, et al., 2020).

During the semi-structured interview, all the EHPs stated that they conduct their interventions (Appendix 19) via a verbal presentation with illustrations; and a PowerPoint presentation if a request is received and the school can accommodate it. School 5 was the only school where the intervention was conducted using a drama skit. Figure 4.6 elaborates on the specific items used, apart from flip charts, posters and pamphlets.

5.2.4. Content of interventions

The second component, instructional or techniques and methods of information delivery, the literature suggest that: 1) interventions incorporating entertainment and 2) interaction tend to improve attitudinal shifts (Taware, et al., 2018). During the data collection, there was an overarching observation is that there is no standardisation of the topics for the health and hygiene interventions and the method of adequate transfer of knowledge, however handwashing, bacteria, diarrhoea and the squeeze bottle/tippy tap are known topics for the health and hygiene interventions conducted by the EHPs. Additionally, under section 4.5. displays the information that was retain by the Grade 7 students, with personal hygiene being the highest at 9,1% (n=15; N=164).

5.2.5. Mode of instruction (implementation)

As with planning, implementation of school's health interventions is influenced by a variety of such as factors including the organisational context and mandate (national policies and guidelines) (Klaic, et al., 2022). It also has to take into account the features of the intervention itself such as the intervention initiator, its strength of evidence and quality, its benefits, complexity, scalability, sustainability, acceptability and accessibility. Also important is design quality and packaging of the intervention (Klaic, et al., 2022).

All the EHPs stated that they conduct their interventions via a verbal presentation with props such as a squeeze bottle, soap and a bucket. Additional illustrations such as pens, papers glitter and food colouring are also used as well as a PowerPoint presentation depending on the venue and the school's needs. While only one school used a drama skit. The second component, instructional or techniques and methods of information delivery, the literature suggest that: 1) interventions incorporating entertainment and 2) interaction tend to improve attitudinal shifts (Taware, et al., 2018). Entertainment-education is considered a potent and cost-effective mode for health education campaigns, that is, despite little research on the effectiveness (Grady, et al., 2021; Carpena, 2024). It is defined as a "process of purposely designing and implementing a media message to both entertain and educate, in order to increase audience members' knowledge about an educational issue, create favourable attitudes, shift social norms, and change overt behaviour (Singhal, Cody, Rogers, & Sabido, 2003, in Carpena, 2024). Carpena's study among indigent urban dwellers in India however, indicated that entertainment-education increased short-term health knowledge scores. These where topics relation to the knowledge of cleanliness and hygiene but also indicated exhibit little decay in retention of information a year later. Even so, health entertainment-education showed limited effects on health behaviours.

The intervention set-up or structural components that might impact results, in this case are:
Lack of resources - The schools across the study did not comply with the stated ratios, as provided in the National Environmental Health Norms and Standards and the ISHP (displayed in Table 4.14). According to the ratios, all schools in the study are overcrowded (see Table 4.14). In addition, all of the schools did not have direct access to soap and toilet paper in the ablution facilities (see figure 22 and table 4.17). Through the semi-structured interviews with the EHPs (see figure 4.4), the common reasoning from the respondents was that monitoring was conducted, but evaluation and implementation was not done. Referring to reporting lines, it was not clearly identified who or where should be receiving the information from the sanitation audits. Therefore, the accountability regarding the lack of infrastructure is not solely

on the EHPs; however, this does imply the need for a holistic approach that includes adequate communication.

Lack of interdepartmental relationships - Linking to the lack of strategy, the need for interdepartmental relationships is crucial, especially when considering the question of whether or not a student feels safe at school. As the social determinants of health was provided for a social worker to be addressed. In addition to the lack of infrastructure, the need to establish relationships with departments such as PW and the DBE is instrumental in not only getting the school compliant but also ensuring a healthy and hygienic environment for the students.

Lack of strategy - A lack of strategy was evident, as mentioned by the EHPs during the semi-structured interview (identified in Figure 4.5, which indicates the constraints and challenges the EHPs face). This lack of strategy is related to a **lack of resources, promotional material and time**. The EHPs said that they do not have the time to produce quality interventions because they are pressurised by their superiors to report on the numbers of visits or interventions; consequently, the important outcome is numbers and not the effectiveness of the interventions.

Lack of knowledge - The lack of knowledge was expressed throughout the semi-structured interview from not knowing the PDR target or the environmental health SOP for events (See under section 4.2 and Appendix 16), the various legislation that informs the sanitation audit and the lack of knowledge on the use of the COMBI tool (i.e., their monitoring and evaluation process). Additional table 4.21 provides the summary opinions of the EHPs towards the sanitation audits, displaying both the lack of knowledge and relevance. Where the relevance displayed the attitude towards the sanitation audit.

Lack of infrastructure - According to the ratios, all schools in the study are overcrowded (see Table 4.14). In addition, all of the schools did not have direct access to soap and toilet paper in the ablution facilities (see Figure 4.22 and table 4.17). Through the semi-structured interviews with the EHPs (see Figure 4.4), the common reasoning from the respondents was that monitoring was conducted, but evaluation and implementation was not done. Additionally, table 4.22 provides the summary of the environmental assessment, displaying the infrastructure lack and table 4.18 providing an average ratio for menstrual bins to girls being 1:116 across the 6 schools.

Adequate training of the evaluation and monitoring tool- With one of the challenges being time – as indicated in Figure 4.5 (EHPs' constraints and challenges) – the role of monitoring

and evaluation does not occur, which the portfolio holder for projects is responsible for, together with their line manager and the health promotion officer. In addition, all EHPs stated that interventions are usually once-off events, with no follow-ups or monitoring and evaluation being done. Furthermore, with the importance of obtaining the provide PDR outcome for the financial year.

In conclusion, the lack of strategy displays the need for standardisation across the metropole, as strategy provides guidance linked to SOP and polices to implement the health and hygiene intervention and ineffective monitoring. Thus, speaking to the identified lack of knowledge amongst the EHP. This lack of knowledge (including adequate training of the evaluation and monitoring tool), hinders or prevents collaborative efforts of interdepartmental interventions and overall, with the lack of strategy, is linked to planning of resources and infrastructure, being that of insufficient time and promotional materials. Thus, addressing these structural components are crucial to enhance the effectiveness of the EHPs interventions and to improve school health and hygiene and are the identified themes established for this study.

5.3. Objective 3: To establish if the EHPs' monitoring and evaluation (M&E) methods of school health interventions are effective

The aim of this study is to establish the effectiveness of EHPs' school health and hygiene interventions. A specific aspect of the study is to establish how EHPs assess the effectiveness of their interventions and how such assessments affect the overall effectiveness. Lankester and Grills (2019) define monitoring and evaluation (M&E) as the methods used establish how well a programme is achieving the objectives. However, the authors distinguish between the two processes insisting that each has a different function. Whereas monitoring refers to ongoing assessment as part of the routine programme management, evaluation is a "systematic review of the programme outcomes and impact often at the end of a funding cycle" (Lankester & Grills, 2019: 153).

With emphasis on monitoring being an ongoing assessment, the COMBI tool is the M&E method of choice. However, based on the data analysis of the semi structured interviews it appears to be a paper exercise only with school audits conducted on an *ad hoc* basis and without a long-term strategy or regular or follow-up. According to **EHP 4** it is *"… very much a once-off kind of project. So, you [are] going to a school and you talk and that's the end of the relationship and it's not just, its time, it's energy, it's building a relationship. I don't feel that we*

as EHPs, we have the capacity to build that and then you'd think that XY has that capacity, but you don't see it always or gain from it" (Appendix 18).

It also appears that previously collected M&E information does not inform the following year's selection of schools. Only one EHP conducted a questions and answers session, to see if there was a transfer of knowledge (see chapter 4). Teachers and groundsmen are also not involved in developing interventions nor collecting M&E data. **EHP 4** (Appendix 18) admits that it is *"not a formalised thing, um, it's like I always say, get feedback from the teachers in the room, get feedback from students and also like you've given them all this information, then we normally do like a little pop quiz at the end, who can remember this and this and this?"*

Only one EHP stated that they had conducted a sanitation audit to help inform what the health and hygiene issues were at the school (see chapter 4). Furthermore, the COMBI Tool is used for data capturing but no data analysis is performed afterwards. **EHP 1** (Appendix 18) states that *"[we] need to evaluate what we are doing – do interviews, a lot of projects, but no real outcome; no analysis of the EH health promotion in general; EHP is doing a lot in general, but what we doing is not being analysed – they come up with targets based on what? We have data, but is it effective".* Only the totals of interventions completed, are recorded and used for the KPIs.

Whilst the sanitation audits are considered relevant by the EHP's, **EHP 13** (appendix 21) comments that "*because we [are] making sure that toilets and sanitation are good. Mind you, at the toilet, there is a lot of stuff happening like germs. So, if the toilet is clean … so like the health, the kids of the school treat it like an adult, so toilets must always be clean like, yes, it must be in a good condition. So, it's very relevant. It's very good to do the sanitation audits.*"

Based on the above statements by the EHPs, they have not identified that a correlation can be achieved between health and hygiene interventions, the school's infrastructure and the student's behaviour towards handwashing and good sanitation. The UNICEF Three Star Approach emphasises the importance of both knowledge transfer and observing handwashing, to create good and healthy habits. Therefore, the lack of monitoring and evaluation, and its analysis displays a gap between the school and EHP working together to improve the importance of respecting the ablution facilities and importance of washing one's hands.

5.4. Objective 4: To establish if the EHPs' of school health interventions are effective

UNICEF South Africa started the National Hand Hygiene and Behaviour Change Strategy in 2017 (South Africa: Department of Health, 2017) with the health facilities score card used for assessing ideal clinics and outcomes or targets for WASH programmes within schools or designated outcomes for the EHPs. In the National Hand Hygiene and Behaviour Change Strategy (2017), the following seven priority bottlenecks were identified, which mirrors the themes identified during this study:

Table 5. 1 The Seven priory boatnecks vs themes of the study

#	7 Priority Bottlenecks	Themes identified during the study
1	Limited planning and accountability for hygiene promotion and behavioural change, national targets.	• Lack of adequate training of the evaluation and monitoring tool • Lack of knowledge • Lack of Strategy
2	Lack of effective techniques towards behavioural change on a national level for hygiene promotion strategies.	• Lack of interdepartmental relationships • Lack of knowledge • Lack of strategy and resources
3	Weak comprehensive monitoring and evaluation systems for health and hygiene interventions.	• Lack of adequate training of the evaluation and monitoring tool • Lack of strategy • Lack of knowledge
4	Insufficient budget allocation across the hygiene sector,	• Lack of Strategy and resources • Lack of interdepartmental relationships • Lack of infrastructure
5	Lack of coordination of health and hygiene interventions, initiatives, and programmes.	• Lack of interdepartmental relationships • Lack of strategy • Lack of knowledge
6	Lack of country support due to no or little evidence-based interventions, initiatives, and programmes. This speaks specifically to the implementation thereof, as the policies are there and have been referenced in this thesis.	• Lack of interdepartmental relationships • Lack of strategy and resources • Lack of knowledge
7	Lack of capacity for health care workers to achieve behavioural change outcomes for health and hygiene interventions.	• Lack of adequate training of the evaluation and monitoring tool • Lack of strategy and resources • Lack of knowledge

With the themes identified through this study on a local level, it is evident that the bottlenecks on a national level have filtered through to the local level within the health and hygiene intervention, initiative, and programmes. This chapter continues to speak to each of the themes. It serves to provide answers to the question of determining how effective the EHPs' interventions have been using the criteria set out by the UNICEF Three Star Approach,

Environmental Health Norms and Standards and the ISHP that were followed during the interventions (see table 3.7 and 3.8). The section that follows is organised according to the Three Star requirements, and each component of the Three Stars will be discussed individually.

5.4.1. One Star schools

One Star schools specifically look at the daily routines at the school. Soap and running water are required to meet the basic hygiene, sanitation and drinking water criteria set by UNICEF. The three criteria for One Star are (i) daily supervision of handwashing, (ii) daily supervision of cleaning, and (iii) the provision of soap and water, with a daily source of drinking water for all children.

Table 4.19 provides insights into the daily supervision of the ablution facilities, where there were mixed responses. Prefects and groundsmen have been tasked with supervising ablution facilities, although the Three Star Approach suggests that group handwashing with soap and water should be supervised by teachers, with the assistance of older students such as Grade 7 students. The Three Star Approach requires group handwashing to take place before lunchtime to reinforce the importance of washing one's hands before eating. This approach also creates an opportunity to deliver messages about hygiene. However, during the data collection, it was revealed that the supervision of the ablution facilities is, instead, to prevent vandalism and bullying from occurring in the ablution facilities. The results, as given in Table 4.19, show that no assistance was forthcoming from the teachers. Introducing group handwashing sessions could provide a more opportune time to conduct further health and hygiene interventions that could reinforce correct hygiene practices at schools.

The second criteria in obtaining a One Star status are that of the daily supervision of cleaning the ablution facilities, where during the semi-structured interview with the groundsmen, was provided in table 4.5. This should be done by the students and supervised by the teachers. The act of cleaning is not used as a punishment but rather to discourage open defaecation and respect for the ablution facilities. However, if a school has a janitor (referred to as a groundsman in the study), children should still be involved in cleaning tasks, supervised by teachers. Apart from the cleaning, the role of the students is to also ensure ablution facilities have soap and water ready for handwashing.

The data in the study reveal that children have no part in cleaning or assisting in keeping the toilets clean; however, each of the groundsmen stated that there is a cleaning schedule for

the ablution facilities (table 4.5). If one compares the various quintile schools, the lowest quintile (being quintile 3) was the only school (school 2) that indicated there are generally no problems at the school. Quintile 4 and 5 schools, meanwhile, have a greater challenge. Cleaning does occur between two and six times a day at the various schools. It was not possible to distinguish if the amount of cleaning is directly proportionate to the vandalism, but it was stated that all the groundsmen clean after break time.

In addition to the above, the groundsmen reported open defection at school 3 and 5. Whilst the research observed signs of toilet walls having been soiled with faeces at schools 1, 3, 4 and 5. Additionally one of the general challenges stated by the grounds was that of open urinate either next to the toilets and in the stairwells, respectively. Consequently, the students of these quintile 4 and 5 schools are contributing to a lack of hygiene. This highlights the importance of sanitation standards, as required by the One Star daily routine of observing hygiene practices at a school's ablution facilities.

In addition, the requirement for water and soap to be available was a request throughout the questionnaires for both the teachers and children. All of the schools have access to potable municipal running water, except for school 2, which receives borehole water from a neighbouring farmer. The teachers at school 2 and 6 stated that soap is available at their school; however, it is not available at the ablution facilities for Grade 7 to wash their hands. It is evident from the responses in Table 4.17 that soap is not available at the ablution facilities.

The data in Table 4.17 provide input on the responses from the teachers, students and groundsmen in answering the question of whether soap and water is available at the ablution facilities.

It is evident from the results that, although the schools have the minimum water and sanitation infrastructure, the lack of hygiene practices such as irregular handwashing; open defaecation and indiscriminate urination, still exists at the schools. None of the schools achieved the requirements to obtain the One Star status. Referring to the study in the Vhembe District Limpopo by Siya and Gumbo (2013), it shares the sentiments of knowledge gap of hygiene practices, infrastructure deficiencies, the need for soap and the lack of importance placed on handwashing.

5.4.2. Two Stars schools

After the One Star is achieved in a school, there are three incremental milestones for hygiene, sanitation and water that are required for a school to gain its Two Star rating. The data collection to determine to what extent the schools could meet the Two Star rating included the Grade 7 questionnaire, the sanitation audit (observations) and the semi-structured interview with the groundsmen.

The Two Star criteria consist of handwashing after toilet use (table 4.20), with soap and water (table 4.17); an increase in the available sanitation (figure 4.15) and menstrual hygiene facilities (table 4.18); and an increase the availability of drinking water at the school (table 4. 20).

Handwashing did not take place in groups, as indicated in the case with the Three Star Approach. The students use the facilities as and when they need it. However, during the observation (indicated by the duration of the observation), the number of the students are reflected in Table 4.20 with the hand washing practices conducted. During the observation, the lack of soap was evident, whereas at one school (school 2), no water was available. For the duration of the surveys, during the first and second observation, there was only one child from school 1 who washed their hands with soap and water during the second observation, with the teacher providing them with soap.

The drinking water availability used in the analysis seen in Table 4.20 refers to the third criteria of the Two Star rating – access to low-cost, point-of-use water treatment in schools. In this study, all the schools have access to water, except for school 2, which has access to borehole water only. Although the borehole water should be compliant with SANS 241, which deals with the quality of potable water (microbiological levels, chemicals, etc.), no documentation was available, or testing done to confirm if the water at school 2 meets the requirements.

The second criteria of the Two Star Approach are to ensure that menstrual hygiene management is in place. During the observations of the sanitation audit (as shown in Table 4.18), it was evident that all schools had menstrual hygiene facilities. However, there are no prescribed norms in the National Environmental Health Norms and Standards for the ratio of bins to female students. However, the results shown in Table 4.18 indicate an average of 116 girls per sanitary bin, with a ratio that ranges from 52 (school 3, quintile 5) to 269 (school 6, (quintile 5). Crankshaw, Strauss and Gumede (2020) indicate that although the majority of the students use the bins in their study (Gauteng) to dispose of sanitary products, 41,4% of the

participants keep their sanitary products in their bags, disposing of it at home. The key reasons are inadequate sanitation and waste disposal facilities.

In this study, the groundsmen at school 3 stated that there are constant issues of girls throwing sanitary pads next to or in toilets (Figure 4.12). However, none of the EHPs indicated that they educate students on the importance of menstrual hygiene.

In order to obtain a Two Star rating, all three criteria – i.e., handwashing, potable water supply and menstrual facilities – are required. It is evident from the results displayed in table 4.14, table 4.18, table 4.20 and figure 4.12 that none of the schools have achieved even a One Star, let alone a Two Star rating.

Although the basic infrastructure is lacking, the reason for not achieving a star is due to the lack of education and supervision (table 4.19) of basic health and hygiene practices, not just from the EHPs, but also from the schools. Based on the Two Star rating, it is evident that the ISHP is merely a document and has not been internalised by the compliance enforcement institutions, the funding institutions and the schools' fraternity. Of note there is no sustainable relationships developed between the school and the EHPs with projects that continued beyond the study – in an effort to capitalise on where the health and hygiene needs are for the EHPs interventions that directly relate to the EHPs' service delivery mandate.

5.4.3. Three Stars schools

This is the final star requirements for schools to meet the country's national standards; complete accessibility to WASH to all students, including children with disability; and social norms on good hygiene behaviour are institutionalised.

In the case of South Africa, schools should adhere to the National Environmental Health Norms and Standards, in addition to the policy requirements of the ISHP. Table 4.22 represents the environmental assessment results, which are based on the observations during the data collection stage of the research.

The list of categories used in Table 4.22 was obtained from the ISHP, which was augmented by the National Environmental Health Norms and Standards, with the Three Star Approach being the foundational framework. The template for the categories and legislation is displayed in Appendix 8: Environmental assessment. The weighting explained in section 4.6.2., where each of the categories has the same weighting and provides a complete total of 20 per school.

Accordingly, in Table 4.22, all the schools achieved above 50% for their environmental assessment, and schools 4 and 5 scored 60%.

The areas that require improvement are waste disposal, pest control and adequate water and sanitation. Table 4.14 indicates that the ratios of the toilet and handwash basins at the schools are inadequate. Furthermore, the food safety of the school is assessed. There is no certificate of acceptability present at the tuck shops and for the food schemes, with little to no food hygiene training conducted. Lastly, the designated smoking area for teachers is not according to the Tobacco Products Control Act, 1993 (Act No. 83 of 1993) stated in the National Environmental Health Norms and Standards.

According to the Three Star Approach designed by UNICEF, the schools in the study have reached partial compliance to all Three Stars. The criteria for no stars are limited to the lack of hygiene promotion and no WASH infrastructure; therefore, none of the schools are rated as having no stars.

Even though the ISHP was implemented in 2012 and the Environmental Health Norms and Standards in 2015 to integrate and regulate school health issues, it is evident, through this research, that this is not being enforced by the relevant authorities. Additionally, table 4.3. provides the insight that 80% of the EHPS are not aware of the relevant legislations, strategy or policies related to their health and hygiene interventions.

5.5. Main themes identified

5.5.1. Lack of knowledge

A lack of knowledge was confirmed through the semi-structured interviews with the EHPs, establishing that there was no knowledge of the ISHP, the National Environmental Health Norms and Standards, and the National Hand Hygiene Behaviour Change Strategy 2016–2020 and various other policies. Furthermore, EHPs displayed a lack of knowledge on the use of the COMBI tool and or applying the principles of the tool. The overview of the EHPs transcripts can be found under appendix 16 and section 4.2.

5.5.2. Lack of infrastructure

The schools across the study did not comply with the stated ratios, as provided in the National Environmental Health Norms and Standards and the ISHP (displayed in Table 4.14).

According to the ratios, all schools in the study are overcrowded (see Table 4.14). In addition, all of the schools did not have direct access to soap and toilet paper in the ablution facilities (see figure 4.22 and Table 4.17). Through the semi-structured interviews with the EHPs (see figure 4.4), the common reasoning from the respondents was that monitoring was conducted, but evaluation and implementation was not done. Referring to reporting lines, it was not clearly identified who or where should be receiving the information from the sanitation audits. Therefore, the accountability regarding the lack of infrastructure is not solely on the EHPs; however, this does imply the need for a holistic approach that includes adequate communication.

The environmental assessment further provided proof of the lack of infrastructure according to table 4.22, all the schools achieved above 50% for their environmental assessment, and schools 4 and 5 scored 60%.

5.5.3. Lack of strategy and resources

A lack of strategy was evident, as mentioned by the EHPs during the semi-structured interview (identified in Figure 4.5, which indicates the constraints and challenges the EHPs face). This lack of strategy is related to a lack of resources, promotional material and time, as has been discussed under section 4.2. The EHPs said that they do not have the time to produce quality interventions because they are pressurised by their superiors to report on the numbers of visits or interventions; consequently, the important outcome is numbers and not the effectiveness of the interventions.

5.5.4. Lack of interdepartmental relationships

With the Three Star Approach being the reference tool, sows that there is a big need of including the community to achieve WASH within a school. Additionally, the ISHP is a policy draw up by the DoH and DBE, displaying the collaborative efforts to ensure safe schooling. Thus, the literature explains for interdepartmental interventions. Therefore, based on the findings there is a lack of strategy, which interlinks to the need for interdepartmental relationships is crucial. In addition to the lack of infrastructure, the need to establish relationships with departments including public works and the department of basic education is vital to get schools compliant but also ensuring a healthy and hygienic environment for the students.

5.5.5. Adequate training of the evaluation and monitoring tool

The implementation of the COMBI tool assist with comparison between the literature review and the semi-structured interview. From the data it was evident that the understanding, implementation and analysis of the tool were incorrect. There is a need for adequate training in the use of the COMBI tool, which is used for the evaluation and monitoring of health and hygiene interventions. However, adequate training should be given to the EHPs, as well as principal EHPs, Head EHPs and health promotion officers. With one of the challenges being time – as indicated in Figure 4.5 (EHPs' constraints and challenges) – the role of monitoring and evaluation does not occur, which the portfolio holder for projects is responsible for, together with their line manager and the health promotion officer. In addition, all EHPs stated that interventions are usually once-off events, with no follow-ups or monitoring and evaluation being done. Furthermore, with the importance of obtaining the provide PDR outcome for the financial year.

There is a lack of alignment between the literature, the legislation, the monitoring tools and what is operationally implemented on the ground. This suggests that there is a need to combine practices with known literature to improve the effectiveness of planned interventions. The implementation of a proper strategy can assist in rectifying most of the themes listed. Although the current health and hygiene interventions seem to be ineffective, the recommendations in the next section could assist in finding solutions to ensure that interventions are effective, so as to promote a healthy and hygienic schooling environment that results in a reduction in illness and disease.

5.6. Limitations

The biggest limitation during the study was time due to: quarterly test periods where principals made it clear that no activities including research takes place during these times. In addition, the researcher worked full-time as an EHP. Data was collected in 2019 and due to covid19 occurring in March 2020 to end of 2021, the research was a frontline worker and did not have the capacity, while legislation promogulated during the pandemic did not allow research to take place. Additionally, time was limited for both the teachers and groundsmen as they both had demanding operational functions within the school.

The behavioural answers from the Grade 7 students were not used as it did not provide relevance to the current study. However, it did indicate that further research is needed on the effectiveness of knowledge transfer that leads to attitude and behaviour change.

Consequently, there was little participation from the Grade 7 students, as this was dependent on the parents providing consent for the child to participate. The forms were provided a month prior to the first data collection, therefore a variable that could not be controlled by the researcher. Subsequently, it limited the amount of Grade 7 students who participated.

During the random selection all quintile schools was represented, however only quintile 3 to 5 responded and participated, as there was no response from quintile 1 and 2 schools, thus limiting the study to only 3 quintiles. This situation did not allow the research to include and assess the current situations at quintile 1 and 2 schools.

Additionally, there was an oversight to specifically include the physical needs of those who are disabled, under appendix 8: environmental health. There is a section listed for physical safety, however, to ensure inclusion and equal accessibility and opportunity, it is imperative that this is included for future research. Alternatively, an environmental health assessment should be designed especially for special needs schools.

5.7. Conclusion of section

In conclusion based on the data specifically from the EHPs, there is a need for standardisation to assist with the effectiveness of the health and hygiene intervention, through management streamlining the strategy for school intervention, not just proving a tangible output, but placing an intangible outcome to the interventions, as they key is preventative measures as an EHP. Implementing a strategy, will ensure that knowledge transfer of how to choose a school, conduct an intervention, with space for innovation and the importance of monitoring and evaluation will be provided, whilst including the importance of the infrastructure linked to the sanitation audit and environmental assessment. Additionally, the standardised strategy can provide the knowledge through information sharing of the various interdepartmental for a collaborative effort and sharing of resources. Thus, the last chapter will speak towards, how a strategy can be implemented and bring standardisation for the health and hygiene interventions conducted by the EHPs.

CHAPTER 6: RECOMMENDATIONS AND CONCLUSIONS

Insights gained from the data analysis and synthesis, highlighted adjustments that can be made on local and individual level as well as on a national level to improve knowledge, infrastructure, interdepartmental relations, strategy development and training opportunities. It encompasses improvements for implementation, but also provide an impetus for rethinking theory. Based upon the findings, recommendations are made with a view to establishing improved practice and effective health and hygiene interventions in schools.

The following recommendations are derived from a comprehensive analysis of the current state of Environmental Health Practitioner (EHP) interventions within primary schools in the Cape Metropole. This study highlighted a critical gap between the legal mandate of EHPs and the practical effectiveness of their interventions, revealing a system often focused on quantitative targets rather than qualitative impact. The findings underscore the need for a paradigm shift, moving from mere 'number crunching' to a holistic approach that prioritizes experiential effectiveness, knowledge transfer, and sustainable behavioural change. Consequently, the recommendations are structured to address the identified deficiencies, aiming to empower EHPs, strengthen interdepartmental collaboration, and ultimately enhance the health and hygiene outcomes for primary school children. These recommendations are tailored for Environmental Health Practitioners, the Department of Health, the Department of Basic Education, and the Department of Social Development, each playing a crucial role in fostering a healthier and more hygienic school environment.

6.1. Environmental Health Practitioners

To ensure that the monitoring and evaluation of school health and hygiene programs is effective, Environmental Health Practitioners (EHPs) need better training on how to use the COMBI tool. This training should focus not just on teaching them how to use the tool, but also on changing their attitudes towards interventions, ultimately leading to improved practices. Research confirms that the COMBI tool is a valuable instrument for EHPs, helping them prepare for future interventions. It helps EHPs identify infrastructure problems and communicate the real needs of schools to relevant departments. However, simply focusing on the number of interventions conducted is not enough. A system for analysing the quality of the information gathered through the COMBI tool is crucial.

One way of introducing effectiveness of the monitoring and evaluation is to workshop the design of a specific and comprehensive health and hygiene intervention for schools from course outline to resources material and a monitoring and evaluation tool (i.e., COMBI tool and the reference tool in this study). The process can start at EHP level first but be expanded to include the three state departments also involved with schools namely the DoH; DBE and DSD. The advantage of such a collaboration is that it will disable the current way of working in silos. A workshop guideline for such a health and hygiene interventions programme (Figure 6.1), can be applied at any governance level. However, best practice would suggest that national government conduct the workshops using templates designed in accordance with policy. Where appropriate the function can be delegated to local; district and metropole municipalities and the workshop adapted to local procedure and requirements.
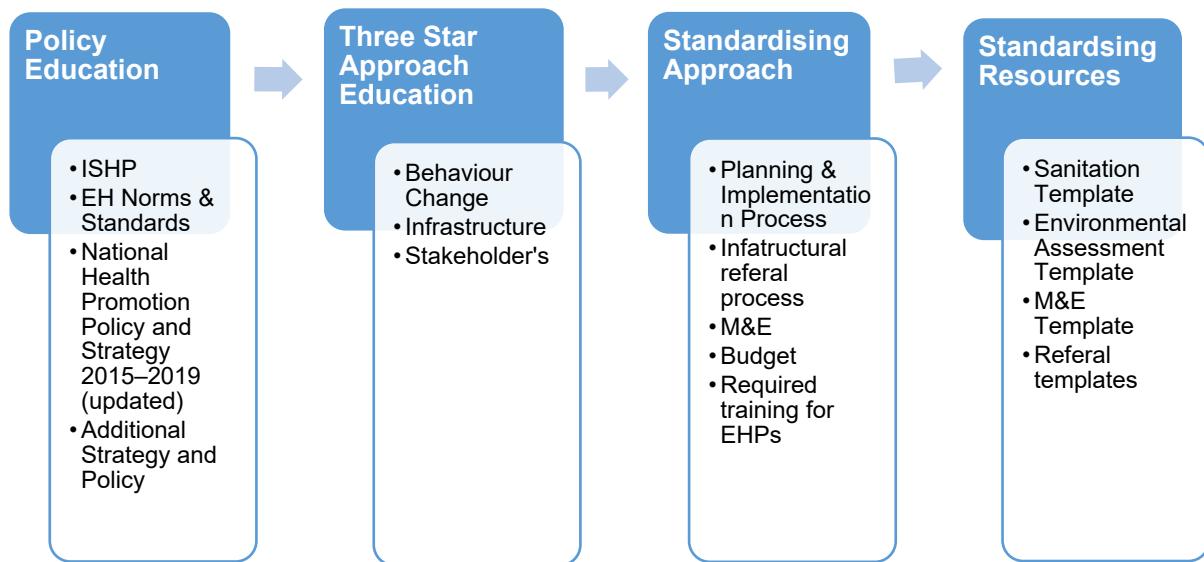
Figure 6. 1: Intervention workshop guideline

The guidelines of the proposed *Environmental Health WASH Approach in Schools* workshop should have four foci: 1) explaining policy education; 2) instruction on the Three Star Approach; 3) schematising the approach and 4) standardising the educational resources. The first step in the process should be convening a task team with an EH representative from each province, and include:

1) **Policy education –** This includes all legislation, policies, and strategy that is linked to health and hygiene interventions for the EHPs, where this study can be a guideline.

During this session the task team is required to dissect the various policies to form a standardised approach, while ensuring inclusion of internal and external parties.

2) **Three Star Approach –** With an explanation of the Three Star Approach this part of the workshop can also cover appropriate stakeholder buy-in; overcoming challenges with; infrastructure and encouraging behaviour change. It is also an opportunity to integrate the Three Star Approach with legislation, policies and strategies at local, provincial and national level.

3) **Standardising the approach –** With the understanding and knowledge of the Three Star Approach and policies, the task team can design a holistic approach to environmental health and hygiene interventions starting with a baseline assessment.

4) **Standardising resources –** Based on the standardised approach, various templates will be required for the implementation of the health and hygiene intervention such as the standard templates for the sanitation audits applied in this study.

The proposed series of workshops also addresses the five main shortcomings in planning, implementing and evaluating health and hygiene interventions in schools that came to light in this study namely (i) EHPs' inadequate knowledge, (ii) deficient infrastructure, (iii) lack of strategy and planning, (iv) ineffective monitoring and evaluation, and, finally, (v) a lack of interdepartmental relationships.

6.2. Department of Health

To enhance the efficacy of school health interventions, it is suggested that the Department of Health implement several key refinements. Firstly, performance monitoring processes should be revised to incorporate qualitative measures of intervention effectiveness, moving beyond solely quantitative targets. This necessitates the development and implementation of standardized evaluation frameworks specifically tailored for school health interventions. Secondly, the department should prioritize comprehensive training for Environmental Health Practitioners (EHPs), encompassing ongoing education on relevant legislation, policies, and intervention strategies, as well as specialized training on the effective utilization of the COMBI tool and other monitoring and evaluation methodologies. Thirdly, fostering interdepartmental collaboration is crucial; therefore, establishing clear mechanisms for collaboration with the Departments of Basic Education and Social Development is essential to effectively address the social determinants of health and promote the integration of school health interventions into broader public health strategies. Finally, the department should ensure adequate resource

allocation to EHPs, providing them with the necessary tools and materials, such as educational resources, to effectively execute their duties.

6.3. Department of Education

The Department of Basic Education holds a pivotal role in fostering a sustainable and effective school health and hygiene environment. To achieve this, it is recommended that the department prioritize the integration of health and hygiene practices into the core school culture, ensuring adequate infrastructure and resources are provided, and that school-based programs align with national policies. Furthermore, strengthening collaboration between schools and Environmental Health Practitioners (EHPs) is crucial; the department should facilitate clear communication channels and encourage active school participation in the monitoring and evaluation of health programs, guaranteeing interventions are tailored to specific school needs. Finally, addressing infrastructure deficiencies remains paramount, with a specific focus on prioritizing the maintenance and improvement of sanitation facilities, ensuring consistent access to essential hygiene products, and collaborating with the Department of Public Works to resolve broader infrastructure challenges

6.4. Department of Social Development

Based on the criteria of the Three Star Approach and the community involved, it is recommended that the Department of Social Development consider a multifaceted strategy to bolster school health and hygiene, with a central focus on mitigating the impact of social determinants. To begin, it would be beneficial for the department to actively acknowledge and address socio-economic factors, such as poverty, food insecurity, and limited access to social services, which demonstrably affect student health and hygiene. This could be achieved through the provision of targeted support services for vulnerable students and their families. Furthermore, the department might prioritize community engagement, fostering collaborative partnerships with parents and community members to reinforce positive health behaviours through the development of community-based programs. It is also suggested that the department actively participate in interdepartmental initiatives with the Departments of Health and Basic Education to develop and implement comprehensive strategies that address the complex needs of students and schools. Finally, it would be advantageous for the department to recognize and support the potential of students as agents of change, empowering them to promote health and hygiene within their school environments and broader communities.

Although it was evident from the data that the EHPs' interventions were not effective, the factors that hindered success were identified. Still, further research is necessary, and the researcher is of the opinion that the proposed workshop series would create the opportunity to also achieve this aim. Furthermore, it is hoped that the current research is instrumental in starting a discourse on developing innovative ways of conducting health and hygiene interventions that will foster behaviour change and facilitate a safe and healthy schooling environment in the Cape Metropole.

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APPENDICES

Appendix 1: Disclaimer for the City of Cape Town

This body of research has been produced by an external service provider for the City of Cape Town in order to inform the administration in its strategic planning and operational matters. It does not constitute the official position of the City.

This research was undertaken by Kelly Morkel, staff number 1005682.

The contents of the research and the associated recommendations are intended to inform decisions to be made by the City of Cape Town, subject to internal processes and approvals, and are in no way binding.

The research findings and recommendations may be assessed by the City of Cape Town to determine if they are:

- reliable
- consistent with the strategic objectives of the organisation
- suitable for administrative action at a local level
- relevant and appropriate
- feasible (affordable within resource constraints)
- compliant with relevant legislation, regulations and procedures

This assessment informs the manner in which the findings and recommendations of research outputs produced by external service providers are taken forward or implemented by the organisation.

For further details, please contact:

NAME	Kelly Morkel
CONTACT NUMBERS	021 910 8630 / 072 137 2334
EMAIL ADDRESS:	kmorkel13@gmail.com
DIRECTORATE	Social Services

Upon ethical approval and once permission from the Educational Department is obtained, an information letter with the reasons and purpose for the research study are to be given to:

1) The principal and the school's Governing Body, asking for permission to conduct research at the school.
2) Parents, for the permission of the participatory involvement of the child. This letter is to be sent via the principals of the various schools.

Principal and governing body

Dear _____

My name is Kelly Morkel, a Master's student at Cape Peninsula University of Technology and am working on my thesis entitled: The effectiveness of primary school health interventions by environmental health practitioners in the Western Cape, South Africa?

I hereby seek your permission to conduct part of my study at your school which will involve a local Environmental Health Practitioner conducting their health intervention with a questionnaire before, after and 1 month after the intervention with the Grade 7 class.

The interventions will take place possibly during a Life Orientation class, as the following topics will be covered: personal hygiene, diarrhoea, handwashing and the oral rehydrate solution. All information gathered is considered completely confidential. Your name or any teacher's name will not appear in any report resulting from this study; however, with your permission, anonymous quotations may be used.

Participation is completely voluntary. Thus, if these arrangements meet with your approval, your signature in the space provided below would be highly appreciated. Your signed approval should be returned via email: kmorkel13@gmail.com.

I would like to assure you that this study has been reviewed and received ethics clearance from the Research Ethics Review Board at CPUT, the City of Cape Town as well as the Western Cape Educational Department. However, the final decision of approval, permission and participation to conduct the study is entirely up to you and/or the school governing body.

I trust that the results of my study will be of benefit to future students and teachers, families and the broader community in the province as well as the broader research community.

Thank you in advance for your assistance in this research.

Sincerely

Kelly Morkel

PERMISSION GRANTED FOR THE RESEARCH SITE: YES or NO

Principal/Governing Body member name: _____

Signature: _____

Parents

Dear Parents

My name is Kelly Morkel. I am completing a Master's thesis at Cape Peninsula University of Technology entitled: Assessing the effectiveness of Environmental Health Practitioners current school - hygiene interventions in the Western Cape, South Africa.

As an Environmental Health Practitioner, the health and safety of our community, especially where children are concerned, is an important aspect we have to deal with on a daily basis. My study, as mentioned in the title, will focus on the effectiveness of Environmental Health Practitioners current school - hygiene interventions in the Cape Metropole area, Cape Town, South Africa. It will involve a local Environmental Health Practitioner conducting a health intervention, with a questionnaire before, after and 1 month later and class participatory involvement in the Grade 7 class. The interviews will take place possibly during a Life Orientation class, as the following topics will be covered: personal hygiene, diarrhoea, handwashing and the oral rehydrate solution. Where your child's assistance with this study will be required and highly appreciated, their participation is completely voluntary and only with your approval.

All information gathered is considered completely confidential. Your child's name will not be required and any teacher's name will not appear in any report resulting from this study; however, with your permission, anonymous quotations may be used.

If these arrangements meet with your approval, please sign this letter where indicated below and return it to your child's teacher. I would like to assure you that this study has been reviewed and received ethics clearance through the Research Ethics Review Board at CPUT, the City of Cape Town as well as the WCED. However, the final decision about participation is yours.

I trust that the results of my study will be of benefit to future students and teachers, families and the broader community in the province as well as the broader research community.

Thank you in advance for your assistance in this research.

Sincerely

Kelly Morkel

I _____ (parent's name & surname), hereby consent to the participation of my child, _____ (child's name and surname), in the Master's study conducted by Kelly Morkel. I understand the nature of this research and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Parent's signature: _____   Date: _____

	CPUT Environmental Health Master's Research Kelly Morkel (209013435) EHP questionnaire
	Intervention at school: Date: Time:
1	Job title:
	1) Environmental Health Practitioner
	2) Senior EHP
	3) Principle EHP
	4) Head EHP
2	Age:
	1. 25-30
	2. 31-35
	3. 36-40
	4. 41-45
	5. 46-50
	6. 51+
3	Highest qualification: 1. National diploma 2. BTech 3. Honours 4. Master's 5. Other:
4	Institution that it was studied at:
5	Government working experience: years months
6	Describe your overall work experience:
7	Are you a portfolio holder? 1 - Yes 2 - No
7.1.	If yes to question 7, which portfolios?
	1. Pest Control
	2. ECDs
	3. Legal Action
	4. Informal Settlement

	5. EPWPs	
	6. Projects: Health Promotions	
	7. Food Control	
	8. Other: Medical Waste	
7.2.	If yes to question 7, what is your responsibility within your portfolio?	
8	Where does your school project PDR target fall?	
	1. 30-39	
	2. 40-49	
	3. 50-59	
	4. No PDR for school projects	
9	What legislation do you use to plan/inform your intervention (policies, any legislation)?	
10	Besides health and hygiene interventions at schools, do you provide any other function according to legislation/norms and standards?	
11	Are you aware of the Environmental Health SOP for events? 1. Yes 2. No	
12	How do you choose which schools are chosen for an intervention?	
13	Describe your preparation for your health intervention.	

14	How do you present your interventions at the schools?
	1. Formal PowerPoint
	2. Verbally with illustrations
	3. Verbally without illustrations
	4. Other: Describe/Elaborate
15	What type of illustrations do you use during an intervention at schools?
	1. Flip chart
	2. Posters
	3. Pamphlets
	4. Other: Describe/Elaborate: squeeze bottle, soap, water
16	Are your school interventions recorded?
	Yes/No
	If yes, how?
17	How do you measure the effectiveness of your intervention?
18	Do you have any monitoring or evaluation tools? Provide examples. 1. Yes 2. No
19	How do you analyse the evaluation?
	Steps?
	1. Yes 2. No
20	What do you do with the analyses of information?

21	Do you have an evaluation for teachers to get feedback? If yes, describe/elaborate. 1. Yes 2. No
21.1.	If yes to 21, was it resourceful? Describe/Elaborate.
22	Are there any constraints that you face in implementing a quality intervention?
23	How do you think you get to change their behaviour/mindsets?
24	Do you think the sanitation audits are relevant? 1 - Yes or 1 - No Further elaborate?

	CPUT Environmental Health Master's Research Kelly Morkel (209013435) Intervention Observation	
School:		
EHP:	Date:	Time:
#	Observations	Comments
1	EHP speaking in their home language	
2	EHP speaking using Grade 7 jargon (not scientific EHP)	
3	Topics they covered (was it in detail?)	
4	Handwashing demonstration	
5	Oral Rehydrate Solution (ORS) explained?	
6	Importance of handwashing explained?	
7	Anything unique that the EHP did?	
9	Other:	
	Notes during the intervention with Grade 7 students	

5.1.   Pre-questionnaire

	CPUT Environmental Health Master's Research Kelly Morkel (209013435) Student Questionnaire Before Intervention
1	Name of the school:
2	Age:
3	Is this the first time that the Environmental Health Department has visited your school? Yes/No
4	Do you remember what they spoke about? If yes, what did they speak about? If yes, what?
5	If yes to 4, what do you remember most about the group that spoke to you? (like was it funny, did they show you pictures, etc.)
6	Do you feel safe at your school? If no, why not?
7	How many times do you wash your hands?
8	When do you wash your hands in a day?
9	What do you wash your hands with at school?
10	Have you seen your teacher or parents wash their hands?

	CPUT Environmental Health Master's Research Kelly Morkel (209013435) Student Questionnaire After Intervention
1	Name of your school:
2	Age:
3	Home language (tick only next to one) 1. English 2. Afrikaans 3. isXhosa 4. Other:
4	What is your language spoken at school? (tick next to one) 1. English 2. Afrikaans 3. Xhosa 4. Other:
5	Did they speak in your language that you understand? Circle your answer. Yes/No
6	Did you enjoy the presentation? Circle your answer. Yes/No
7	What did you enjoy about the presentation?
8	What did they speak about?
9	What is diarrhoea?
10	Name 2 signs & symptoms of diarrhoea?
11	How can you prevent diarrhoea?
12	To make the sugar salt solution, we need _____ boiling water, _____ of sugar and _____ of salt.
13	When should you wash your hands? (you can choose more than one answer by ticking next to it) 1. Before sleeping 2. After playing outside 3. Before eating

	4. Other:
14	How important is washing your hands? (colour or make a cross over the face you want to choose) Super Bad Bad Maybe Good or Maybe Bad Good Super Good
15	When do your par〔...〕 one/more) 1. Before sleeping 2. After changing a baby's nappy 3. Before making food 4. Other:
16	If there was a burger, pasta or cake on the table, which one would you choose and with what would you eat it?
17	When visiting a friend's house, after using the toilet you realise there is no soap to wash your hands; what do you do?
18	What do you usually eat with – your… (tick next to the one you use) 1. Hands 2. Knife and fork 3. Spoon 4. Other:
19	The handwashing steps are in the incorrect order; number them 1 to 6 under the pictures so that the numbers follow the correct handwashing steps. Rub & scrub your hands Dry your hands Wet your hands Turn off tap Soap Rinse
20	What do you wash your hands with?
21	Where do you eat at school during break?

5.3. Students third questionnaire

<table>
<tr><td colspan="2" align="center">CPUT Environmental Health Master's Research
Kelly Morkel (209013435)
Student Questionnaire 1 Month After Intervention</td></tr>
<tr><td>1</td><td>Name of your school:</td></tr>
<tr><td>2</td><td>Age:</td></tr>
<tr><td>3</td><td>If there was a burger, chips or cake on the table, which one would you choose and with what would you eat it?</td></tr>
<tr><td>4</td><td>When visiting a friend's house, after using the toilet you realise there is no soap to wash your hands; what do you do?</td></tr>
<tr><td>5</td><td>When the bell rings for break, what is the first thing you usually do when leaving the class?

a) Eat your lunch

b) Play outside

c) Go to the bathroom</td></tr>
<tr><td>6</td><td>Is there always water and soap for you to wash your hands at school? Yes/No</td></tr>
<tr><td>7</td><td>Do you think people's hands are generally dirty?

Yes/No

If yes, why do you say so?</td></tr>
<tr><td>8</td><td>Do you use both soap and water at home to wash your hands?

Yes/No

If no, why?</td></tr>
<tr><td>9</td><td>How often do you use soap and water …?

a) Very often

b) Often

c) Sometimes</td></tr>
</table>

	d) Never
10	Have you or anyone in your family that lives with you been sick with a runny tummy (diarrhoea) in the last month?
11	If anyone was sick, what did you do to help them?
12	What did your parents/guardians do to help them?
13	When do you usually wash your hands (besides before eating)?
14	Why should you wash your hands?
15	When do your parents/guardians wash their hands?

<table>
<tr><td colspan="4" align="center">CPUT Environmental Health Master's Research
Kelly Morkel (209013435)
Groundsmen</td></tr>
<tr><td>#</td><td>School:</td><td colspan="2">Date: Can be found under Chapter 3, table 3.4</td></tr>
<tr><td></td><td>Questions</td><td>Comments</td><td></td></tr>
<tr><td></td><td>Amount of groundsmen staff</td><td>Male: 15</td><td>Female: 7</td></tr>
<tr><td>1</td><td colspan="3">Is there a general maintenance programme at the school?

1. <u>GM 1:</u> The school recently had a maintenance upgrade: plumbing, ceiling and painting, first time after 56 years, still struggling with alarm, fencing around the school, and the gate for the car parking lot don't work.
2. <u>GM 2:</u> Fix as need be, through routine inspections (i.e. windows, doors, piping/leaking, toilets). It has been 2-4years that new toilet have been at the school. Note: lids have been taken off as it was broken and awaiting new lids.
3. <u>GM 3:</u> Yes, cleaning of classroom major repairs diverted to Provincial Public Works, where they took a year to paint, waited 4 years for aluminium window frames and replacement of toilet cisterns minor maintenance is done by us like locks and plugs.
4. <u>GM 4:</u> Not really ad-hoc maintenance-only major items are on a type of maintenance programme. All the maintenance is done by the school (internally by the groundsmen).
5. <u>GM 5:</u> Ad-hoc-no formal maintenance, main duties: Locks, sweep classes, clean ground and empty bins.
6. <u>GM 6:</u> Broken fix it- no plan in place for major jobs, they get someone in every now and then.</td></tr>
<tr><td>2</td><td colspan="3">Do you have the resources and materials for maintenance?

1. <u>GM 1:</u> Struggling with cleaning equipment.
2. <u>GM 2:</u> Principal buys resources when needed, there is system in place: order a week before materials are depleted such as cleaning chemicals and equipment, order at least once a quarter.
3. <u>GM 3:</u> There is a lack of money, school have to general finances Province gives money once a year.
4. <u>GM 4:</u> Resources are always available.
5. <u>GM 5:</u> Order material for PPE-boots, but overall don't have for maintenance required.
6. <u>GM 6:</u> Principal assist at all times.</td></tr>
<tr><td>3</td><td colspan="3">What is the general state of the senior toilets?

1. <u>GM 1:</u> Children clean the quad area-when they put out of class for vandalism occurs in the toilets, therefore requires constant supervision.
2. <u>GM 2:</u> One toilet for juniors and seniors Children pee next to the toilet at times and use menstrual bins adequately.</td></tr>
</table>

		3. <u>GM 3:</u> Children from more disadvantage background is friendly and respect the toilets. Spoilt children don't care about the state of hygiene, "It's not my job" children would say. 4. <u>GM 4:</u> Generally, no complains, children however vandalise every now and then. Mostly on the boy's side that vandalism occurs. 5. <u>GM 5:</u> Urinal giving a problem for last week. Clean twice a day with observations during the day, morning (clean), afternoon (clean), observe twice (flushing and emergency). 6. <u>GM 6:</u> Yes, place HTH over the weekend in urinals and sometimes in the week from the odour and cleansing.
4	**What is the general hygiene of the senior toilets?**	1. <u>GM 1:</u> Can't get to maintenance, due to the groundsmen having to stand toilet duty to prevent vandalism occurring in the toilets. 2. <u>GM 2:</u> Generally, don't have any problems. 3. <u>GM 3:</u> Poor, should start educating the younger grades to respect the toilet. 4. <u>GM 4:</u> Boys urinals are really bad, Girls are fine. 5. <u>GM 5:</u> Been having problems with the urinal for the last week. 6. <u>GM 6:</u> Okay, boy's don't lift the seats. Girl's vandalism by writing on the wall, menstrual pads on the floor and they don't flush at times.
5	**Is there anything that you struggle with from the seniors?**	1. <u>GM 1:</u> Groundsmen stated "his responsible for the safety & hygiene" and his biggest struggle is the amount of children. 2. <u>GM 2:</u> No problems, management support is good. 3. <u>GM 3:</u> Staff shortage, toilets are out of services, finance needs to generate monthly for maintenance. Vandalism and break-ins happens on weekends, often have ADT, comes when the damage is done already, break-in, theft and vandalism 3 times already, where they also defaecated in the passages, burnt tires where the foot prints showed that it was a child (possibly children from the school). 4. <u>GM 4:</u> Urinals smell and minor vandalism 5. <u>GM 5:</u> Children comes from different households, their disciple plays a role in the toilet, children eating and playing ball in the toilets and break doors-kick doors down in the toilets. 6. <u>GM 6:</u> Children stands on the toilet seats and cisterns-therefore damaging it Do #2 on the seat and put faeces on the wall, children's behaviour is a problem at times.
6	**What is be your biggest challenge at the school?**	1. <u>GM 1:</u> Teachers don't follow the duty roster for break, expect the groundsmen to break up fights, with no help or guidance. Struggle to clean all 28 classes (45-47 children in a class), within 3 staff members. The children from the rural areas, which don't know how to use a toilet (foreigners) needed to be taught (3 children physically showing how to use the toilet). Children urinate on the staircases and defaecate behind the buildings by the trees. Sit next to the toilet, afraid of the water in the toilet, as they don't know where it is going to or coming from, with a language barrier.

		2. <u>GM 2:</u> Very happy no big challenges, the school is like a family, everyone can talk and listen to each other, with a good understanding. 3. <u>GM 3:</u> Staff shortage, toilets are out of services, finance needs to generate monthly for maintenance. Vandalism and break-ins happens on weekends, often have ADT, comes when the damage is done already, break-in, theft and vandalism 3 times already, where they also defaecated in the passages, burnt tires where the foot prints showed that it was a child (possibly children from the school). 4. <u>GM 4:</u> Boys get out of control sometimes and fights and the caretakers usually step in and not the teachers. There is a lack of respect for the caretakers overall. 5. <u>GM 5:</u> Perfects monitor toilets to prevent bully and vandalism. 6. <u>GM 6:</u> Children don't use toilets properly. Houses throw their rubble over the school's wall into the school's fields. Some children never used a public toilet and is the first time at school.
7	**Other:**	1. <u>GM 1:</u> Children has increased from 680 to 1200 over the last year, groundsmen sometimes need to stand in for teachers in the classrooms and work from Monday till Sunday. 2. <u>GM 2:</u> n/a 3. <u>GM 3:</u> Note: Life skills has been taken away and it not in depth, have problems like when girls have questions there is no one to attend her questions (i.e. menstrual questions). 4. <u>GM 4:</u> Caretakers break are during breaktime and then the teachers and prefects are to monitor the grounds. Only males cleaning, so girls ask why is a male cleaning the girls toilets. Toilet's and soap use to be in the toilets, but it was changed-don't know why. 5. <u>GM 5:</u> Teachers duty are the outside area. Females: admin block, toilets, classrooms, tea and coffee. Male: toilets, quads-cleaning, cleaning of bins 6. <u>GM 6:</u> n/a

Appendix 7: Teacher's questionnaire

<table>
<tr><td colspan="6" align="center">CPUT Environmental Health Master's Research
Kelly Morkel (209013435)
Teachers Questionnaire</td></tr>
<tr><td>School:</td><td colspan="5">Date: Can be found under Chapter 3, table 3.4, second session</td></tr>
<tr>
<td>1</td>
<td rowspan="2">Would you consider the area the school in volatile? Yes/No. Why?</td>
<td colspan="2">Yes</td>
<td colspan="2">No</td>
</tr>
<tr>
<td>n=
4</td><td>%</td><td>n=
6</td><td>%
60</td>
</tr>
<tr>
<td></td>
<td colspan="5">Why?

1. Gang violence, shooting during and after school time.
2. Gangsterism & drugs very rife in the area, shooting around the school during school hours.
3. n/a
4. It is fairly quiet area. Very little gang activity.
5. School is situated in a quiet, peaceful residential area.
6. n/a
7. Yes, sometimes there are gang-related fights and shooting close to our school.
8. With regards to gang violence, it's moving closer to our school area.
9. Our immediate surroundings are relatively safe.
10. n/a</td>
</tr>
<tr>
<td>2</td>
<td colspan="5">Are there any social issues that you are aware of in the Grade 7 group?

1. Gangsterism, poverty, foster issues and family issues
2. Neglect, parental issues, Single parents/grandparents taking responsibility for children.
3. Not really. One or two, would come with dirty clothing, on a Monday, but not really social issues.
4. Yes, poverty, drug abuse within the homes, neglect and domestic violence.
5. Yes, poverty, drug abuse within the homes, neglect and domestic violence.
6. Yes, poverty, family factors and bullying.
7. Home- related-single parents, divorce, unemployment, drugs, bullying.
8. There is social issues that they have are matters that stem from the home.
9. Not actually, just the normal growing up issues. No drug or gangsterism.
10. No.</td>
</tr>
<tr>
<td>3</td>
<td>Are Grade 7 students supervised before break time when using the toilets and for washing hands?</td>
<td>2</td><td>20</td><td>8</td><td>80</td>
</tr>
<tr>
<td>4</td>
<td>Is there soap and water available for Grade 7 students' toilets? If not, why not?</td>
<td>2</td><td>20</td><td>8</td><td>80</td>
</tr>
</table>

	Why?				
	1. No reason. 2. No soap, water is available in bathrooms. Before soap was issued to the classes, no longer. 3. In the class soap is kept, with a bucket of water after each break. 4. Taps are not working at the moment, no soap given (probably due to the budgetary constraints). 5. Hand sanitiser in the class. 6. Water. 7. Not in all the toilets, students bring hand sanitiser to school-water is available. 8. They have soap in the classes, but students don't necessarily ask for it. Water is available. 9. I provide my students with soap, but no soap in toilets. 10. Ample soap.				
5	**Is there paper towel or towels at the hand basin? If not, why not?**	1	10	9	90
	Why? 1. Students throw the toilet paper against the ceiling. 2. Students destroy, very destructive-tissues and toilet paper in class. 3. None 4. Probably due to the budgetary constraints. 5. Students take paper with them. 6. No answer. 7. Toilet paper is brought to school by students, students misuse if left in toilets. 8. Students have in the classroom and take with when they go to the bathroom. 9. Students are provided with toilet paper. 10. A class towel is there, when they return to class.				
6	**Has Grade 7 learner ever complained about the state of the toilets?**	6	60	4	40
7	**Have a Grade 7 learner ever complained about there not being soap and water?** 1. No 2. Yes, but we make an alternative by making sure we have in classes. 3. Not really, only when the tanks have no water and the farmer hasn't filled it, which doesn't happen often. 4. Yes 5. No 6. No 7. No, they bring their own hand sanitiser. 8. No 9. No 10. No, teachers also provide soap.	3	30	7	70
8	**Does the Grade 7 students have access to drinking water? If yes, where?**	10	100	0	0

	Where?
	1. Toilets because they stole, the taps and kids also messed with the water.
	2. Taps in the playgrounds/bathrooms.
	3. None.
	4. They use the basin in one of the grade 7 classrooms or the sickbay toilets.
	5. None.
	6. Kitchen and toilets.
	7. Outside taps on the school premises.
	8. They have access to water, not necessarily drinking water, outside taps.
	9. Taps in quads and play area.
	10. Numerous taps in an around the building.
9	**What are the general state of the toilets?**
	1. No answer
	2. Satisfactory.
	3. Our toilets are generally very neat as the caretakers clean them everyday after each break.
	4. In a poor state, not cleaned often enough, not enough facilities for all the students, because the second set of toilets are never opened.
	5. Toilets are cleaned regularly, but are vandalised by the students.
	6. Gets cleaned everyday.
	7. Building is old, but toilets are clean.
	8. It has a bad smell. At present we are having problems with the boys toilets. Urinals are blocked.
	9. Good, cleaned 3 times per day.
	10. Good, cleaned 3 times per day.
10	**Where do the Grade 7 generally have lunch?**
	1. Clean, but the kids are vandalising toilets.
	2. In the playground, few chairs are available to sit.
	3. "On the benches in front of the kitchen.
	4. In the quad in front of the classes.
	5. In the playground.
	6. Outside, some stay in the class.
	7. In class, both intervals.
	8. They eat in the classroom before going out to play.
	9. In play area.
	10. On playground.

11	**How often is hand and hygiene education given to the Grade 7 students?**
	1. We speak about it daily.
	2. Everyday.
	3. Regularly.
	4. Rarely.
	5. In Natural Science, Life orientation lessons.
	6. Life Orientation lessons and random talks in class.
	7. Life Orientation classes.
	8. We speak about hygiene often, it is also part of the syllabus.
	9. Not often, during Life orientation periods.
	10. Done by LO teacher.

Appendix 8: Environmental assessment

<table>
<tr><td colspan="5">CPUT Environmental Health Master's Research
Kelly Morkel (209013435)
Environmental Assessment</td></tr>
<tr><td colspan="5">According to the Integrated School Health Policy, an environmental assessment should be undertaken by Environmental Health Officers.</td></tr>
<tr><td colspan="2">Date:</td><td>Time:</td><td colspan="2">School:</td></tr>
<tr><td colspan="3">Staff (groundsmen/women)</td><td colspan="2">Male:
Female:</td></tr>
<tr><td>#</td><td>Assessment categories</td><td>Legislation undertaking</td><td>What to look for</td><td>Answers</td></tr>
<tr><td>1</td><td>First aid kit</td><td>The Children's Act, 2005 (Act No. 38 of 2005)</td><td>How many:</td><td></td></tr>
</table>

| 2 | Sick bay | The Children's Act, 2005 (Act No. 38 of 2005) | (a) An adequate and equipped sick room must be provided for isolation of sick students on the premises in line with the requirements of the Children's Act.
(b) One more room should be available to be utilised as a sick bay for the isolation of any pupil that may fall ill. The office may be utilised for this purpose.
(c) The area must be provided/ equipped with a handwash basin with a supply of running water.
(d) An approved, lockable and adequately equipped first aid kit should be made available in the sick bay area for treatment of minor injuries or illnesses.
(f) The sick bay must be equipped with a bed or waterproof mattress.
(g) Proper supervision should be provided at all times for a pupil placed in the sick bay. | |

| 3 | Adequate water & sanitation | National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977) | Adequate flushing system and running water: Yes/No
Toilet ration 1:25 children
Urinal ration 1:50 boys
Handwash basin 1:25
Handwash basin located in or immediately adjacent to the toilets: Yes/No
Separate toilets and handwash facilities must be provided for staff members on the premises: Yes/No
Staff toilet ration 1:12
Toilets must provide privacy and security: Yes/No
Toilet facilities should be kept unlocked at all times during school hours: Yes/No
Cleaning and maintenance plan in place: Yes/No
All toilet facilities should be designated/separated by gender: Yes/No
An adequate supply of soap and toilet paper should be maintained in the toilet facilities: Yes/No | |

	Adequate water & sanitation	National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1978)	(a) A reliable water point, with soap or a suitable alternative, must be available at all the critical points within the school, particularly in toilets and kitchens. (b) Reliable drinking water access points should be accessible to staff and school children, including those with disabilities, at all times. (c) If no running water is available on the premises, a minimum of 5 litres per person per day for non-residential children and staff must be kept and stored hygienically on the premises for all purposes (drinking, personal hygiene/handwashing and cleaning). For boarding schools, a minimum of 20 litres per person per day for all residential school children and staff must be available on the premises for drinking, washing up, cleaning and food preparation purposes. (d) Handwashing is encouraged in children. Simple and low-cost hand-washing points can be made in various ways and are utilised for areas with no running water: (i) a pitcher of water and a basin (one person can pour the water for another to wash their hands; the waste water falls into the basin); (ii) a small tank (e.g. an oil drum) fitted with a tap, set on a stand and filled using a bucket, with a small soakaway or a basin under the tap to catch the waste water; and (iii) a "tippy-tap" made from a hollow gourd or plastic bottle that is hung on a rope and that pours a small stream of water when it is tipped.	
4	Waste disposal	Waste Management Act, 2008 (Act No. 59 of 2008)	The outdoor play area must be kept clean and free from litter, debris and accumulation of other waste. Waste management must ensure proper refuse storage, collection, transportation, transfer and processing, materials recovery and final disposal. Waste minimisation (recycling, reusing, reducing)	
5	Physical safety	National Environmental Health Norms and Standards for Premises of 2015	Fencing around school: Yes/No Outdoor shaded areas to prevent children from being exposed to excessive heat/sun exposure during playtime: Yes/No Entrance and exit should be	

			controlled so as to prevent unauthorised entry to the school premises: Yes/No	
6	Food safety (cooking area)	Foodstuffs, Cosmetic and Disinfectants Act, 1972 (Act No. 54 of 1972)	Food scheme Amount of children Certificate of Acceptability (COA) Food handlers training	
7	Vector control	National Environmental Health Norms and Standards for Premises of 2015	(a)The density of vectors in the school must be minimised. (b) School children and staff must be protected from potentially disease-transmitting vectors. (c) Vectors should be prevented from contact with school children and staff or substances infected with related vector-borne diseases. (d) Basic environmental control methods should be the basis of any strategy – such as proper disposal of excreta, food hygiene, drainage, solid-waste disposal and routine cutting back of vegetation. (e) Mosquitoes and flies should effectively be excluded from buildings by covering opening windows with fly screens and fitting self-closing doors to the outside. The use of chemical controls must be conducted in accordance with the specifications as set out in Chapter 3 of the Norms and Standards, such as residual insecticide spraying in and around the school. (f) Students and staff with vector-borne diseases such as malaria and typhus should be identified and treated rapidly. They should not attend school during the infectious period so that the related vectors do not transmit the disease to other people in the school. (g) Regular inspections are carried out to detect and treat body lice and fleas. (h) The school premises and, to the fullest extent possible, the immediate surroundings of the school, must be kept free of faecal material to prevent flies and other mechanical vectors from carrying pathogens.	

8	Ventilation (airborne infections)	National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977)		
9	Smoking area	Tobacco Control Act, 1993 (Act No. 83 of 1993)	Allocated smoking area, away from students	

Appendix 9: Sanitation audit

CPUT			
Environmental Health Master's Research Kelly Morkel (209013435) Sanitation Audit			
Total amount of students:		Amount of staff members:	
Total amount of Grade 7 students:		Staff toilets: Urinal M- F-	
#	Questions	Girls	Boys
1	Supervision of students in toilets		
2	Amount of Grade 7 students divided up into girls and boys		
3	Amount of toilets		
4	Amount of urinals		
5	Are all toilets working?		
6	If no, what are the defects and how many are there?		
7	Is there toilet paper present in the toilets?		
8	Open defecation and urination at the school?		
9	What is the hygiene of the toilets? Good – Average - Poor		
10	Is there running water available?		
11	If no, what alternatives are implemented?		

12	Amount of handwash basins		
13	Are all handwash basins working?		
14	If no, what are the defects and how many?		
15	What is the hygiene of the handwash basin? Good - Average - Poor		
16	Is there soap available?		
17	Are there a paper towel or towel available?		
18	Are menstrual containers provided?		
19	Are there doors on all the toilets?		
20	Handwashing and hygiene posters/ information present in toilets?		
21	Scheduling of cleaning of the toilets?		
22	Staff toilets: Clean, soap and paper towels?		
23	Handwashing observations		
24	Other		

Appendix 10: Ethical Approvals

10.1. City of Cape Town research approval

Approval for City Health's own staff initiated research

Name: Kelly Morkel
Staff number: 10050268
Title and MARS number: The effectiveness of primary school health interventions by Environmental Health Practitioners in the Western Cape, South Africa. (Project ID: 7958)

(Attach summary of research proposal)

Guiding Criteria	Yes/No	Additional Comments
Research topic/title is sound?	Y	
Research has clear aim and objectives?	Y	
Research questions are sound and aligned to the stated objectives?	Y	
Research methodology is sound?	Y	
Research aim and objectives aligned to one or more of the CCT's Priority Objectives?*	Y	P₁, P₂
Research aim and objectives aligned to one or more of the CCT's Strategic Focus Areas?*	Y	Cerny Cry
Research outputs/deliverables are clearly defined?	Y	
Research demonstrates value for money/resource input?	Y	
Research poses any potential risks to the CCT?	N	

*See below for list of objectives and strategic focus areas

Approval:

1. Line manager

Signature
Name ... André C. Vosloven
Date ... 2019/05/06
Comments (e.g. time allocation during work hours and inclusion in WSP)
... Staff Member To Take Leave For Data Collection.

189

....
....

2. **Area/Branch Manager**
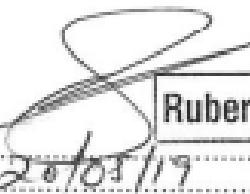
Signature ....
Name ..... Ruberto Isaaks
Date 28/05/19

Comments ..... Supported.
....
....
....
....

3. **Director City Health**

Signature
Dr Waariso Fareed
Date ..... Dr W. Fareed 2 8 MAY 2019

Comments
....
....
....
....
....

10.2. CPUT Ethical Clearance

Cape Peninsula
University of Technology

P.O. Box 1906   Bellville 7535 South Africa   Tel: +27 21 953 8677 (Bellville), +27 21 460 4213 (Cape Town)

Ethical clearance certificate   **Reference no: 209013435/04/2019**

Office of the Chairperson Research Ethics Committee	Faculty of Applied Sciences

The Faculty Research Committee, in consultation with the Chair of the Faculty Ethics Committee, hereby approves ethical clearance for research proposal of **Kelly Morkel (209013435)** for research activities related to a project undertaken for a **Magister Environmental Health** at the Cape Peninsula University of Technology.

Supervisor(s): Mr. M.H.A. Agenbag

Title of dissertation/ thesis:	Assessing the effectiveness of primary school health and hygiene interventions by Environmental Health Practitioners in the Cape Metropole area, Cape Town, South Africa

As such, this ethical clearance is issued on the basis that due diligence will be taken when involving human/animal subjects. Ethical clearance given was on the basis that, all the required/requested information complied with minimum standards for ethical clearance.

Comments (Add any further comments deemed necessary, e.g. permission required)
1. Ethical clearance is granted for the duration of the study. An annual progress report is required.
2. Research activities are restricted to those detailed in the research proposal.
3. Data/Sample collection/Participant consent permission is required for this study. The questionnaire must be translated in to three regional languages, or a translator must be made available. Questions are therefore restricted to those submitted for evaluation. Any change will then require the submission of a new ethical clearance application.
4. The research team must comply with conditions outlined in AppSci/ASFREC/2015/1.1 v1, CODE OF ETHICS, ETHICAL VALUES AND GUIDELINES FOR RESEARCHERS.

	14 – 06 – 2019
Signed: Chairperson: Research Ethics Committee	Date

10.3. Western Cape Government Department of Health

Western Cape Government

Health

Directorate: Community Based Programmes
Western Cape Dept of Health
Bellville Health Park
Parow 7500
11.12.2018

Letter in support of Ms Kelly Morkel's study project.

To whom it may concern:

I hereby endorse the acceptance of Ms K Morkel for the Masters Degree in Environmental Health and has the full support of this office in her efforts to complete the degree. The skills obtained from this study will contribute significantly to her work as an Environmental Health practitioner.

Ms Morkel has excelled in her work despite severe staff shortages and resource constraints in recent times. She has remained dedicated to her duties and has maintained a high standard of professionalism in dealing with colleagues and clients. Her positive and caring demeanour makes her a very popular and valued colleague in her office and within the environmental health fraternity.

I believe that Ms Morkel will benefit tremendously from this experience and undertake to support and encourage her during her period of study.

Yours sincerely

Danie Louw

Provincial Environmental Health Coordinator
Western Cape Department of Health
2nd Floor, Bellville Health Park
Frans Conradie Drive
Bellville West
7500
Tel. 021 815 8800
Cell: 0839559294
E-mail: Danie.Louw@westerncape.gov.za
Website: www.westerncape.gov.za

Appendix 11: Global Handwashing Partnership

GLOBAL
HANDWASHING
PARTNERSHIP

January 3rd, 2019

Kelly Morkel
Cape Peninsula University of Technology

Re: Research proposal in school hygiene

Dear Ms. Morkel,

Thank you for sharing your proposed research with the Global Handwashing Partnership. I am pleased to see that your research focused on school hygiene, given its vital role in public health and education. This looks to be an excellent study, with potential to inform decision making in WASH in Schools programs globally. I look forward to reading the outcomes of your research.

The Global Handwashing Partnership will be happy to support your work as we are able. While we are unable to offer financial support, we would be pleased to help disseminate your research and connect you with global experts.

Thank you for your ongoing commitment to handwashing, and I look forward to staying in touch.

Best wishes,

Carolyn Moore

Secretariat Director

Global Handwashing Partnership

Appendix 12: EHP's Qualification

EHP	Quote/s
1	BTech and busy with Public Health master's
2	I've got a B.Tech in Environmental Management
3	Um, my diploma. So this year, my degree. I've got one subject left
4	I've got my B.Tech.
5	B.Tech Environmental Health
6	B.Tech.
7	B.Tech
8	Environmental B.Tech
9	National diploma.
10	B.Tech
11	Bachelor's degree in Environmental Health.
12	B.Tech
13	B.Tech
14	National Diploma: Environmental Health
15	B.Tech

Appendix 13: School's Project PDR stated by the EHPs

EHP	Quote/s
1	No PDR for schools, HPO is responsible for this target
2	I know it's definitely for the health promotion itself, but I can ask X. I'll just quickly ask (*walks away*). We include not just schools. He's actually just saying that our health promotion target is just under five. Yeah, I mean we do the schools but, um, as I say, that's not a target.
3	No, I didn't know about targets. I just know that each, whatever area you in, that are you responsible for that school. So I didn't know there was a target.
4	So, um, with us we share the target with the health promotions officer, which is Z, and what we were given was 20, um, for the year, financial year, and so we split it between our office on Lakeside but, um, our office on Lakeside is very adamant that that's not their job. Primary school, they happy to work in ECDs, um, but as far as going to schools it's not them. So we, I'm not responsible for the staff of what they

	supposed to do. Like XY, he ended up doing most of the schools and I think this year, he's kind of put his foot down. I don't actually know what's going on there. That's the situation. So, at the moment we [are] doing one school a month, it's supposed to be two a month, um, the split, and I don't think we reached target last year. Let's just say the health promotion officer and EH, we're not on the best of terms. There's no sharing of info, working together. So it's very much each to their own. Figure it out.
5	Um, for the school projects, I think we're supposed to do (*thinking*) … a school a month or a school every two months. I think so.
6	I forgot the number but, yes, we do have a target.
7	Um, I sat with my head last year and she said school projects is the responsibility of the health promotion officer. So if she will need our assistance, then she will call on us but we don't do any schools. But it's not part of our planning. We mainly just do informal settlements and then with like global handwashing day and special requests
8	I think it's 10 per office. So 10, 10. So I think it's 20 for the sub-district for the year.
9	Yes, um, for schools I think within our district at the moment it is 16. Informal settlements it is 210 last I heard and yeah schools and informal settlements basically. Others we do like throughout the food and the ECDs we cover that as well, but they are an indicator of the 16 and 210.
10	So, my office we're supposed to do 10. And then the other office is supposed to do 10.
11	Look, we must do one school per person per year. So I think it's nine or 10. Ten schools, yeah, I think it's 10 schools per year.
12	Yes, but it changes every year. At the moment, I still know it as one school per EHP per year and I think it increases every year, but I'm not sure.
13	I'm not really sure, like the target. Every quarter, we do a project and I'm part of that at the schools.
14	Our target is … I think its three schools per quarter per year. Yes. So, they're broken up into groups of, I think, three EHPs and then each EHP is required to do at least one school for the quarter.
15	For schools, each and every quarter, um, I think with Silvertown it changed. So this quarter, it could be Silvertown so, for instance, three people in this quarter, it will be three people. There is a timetable so someone takes care of that, the schools' portfolio. So currently we have like three people that need to produce for the quarter. So it doesn't actually matter when you do it in the quarter, but as long as we do it.

	So, they would say X for January and February, but it doesn't matter when you actually do it as long as we do it in the quarter.

EHP	Quote/s
1	I don't do schools [only when requested
2	Well, it's mainly the poorer areas or the farm schools and then obviously the poorer areas as well. We also then liaise with the school nurse [who] obviously knows all the schools and, yeah, they would also recommend, and they do the deworming as well, so then they obviously know.
3	Okay, so last year for the diarrhoea cases, it's mos X's thing to do, um, every November, so Fisantekraal was my school, the Z school, so that was my responsibility, that school. But the other schools, they've given me a chance to do the intervention or to do the, wat sê 'n mens? (*English translation:* What does one say?*)* That is basically the only primary school there, and it's also government-based.
4	Okay, so our area is like split. It's quite a big gap, um, economically. So we focus on schools that are less privileged in poorer communities. Just because the other schools that we approach in the more affluent areas are less welcoming (*Kelly shocked:* Oh wow, okay). But it comes down to relationship, which we don't have. So basically like we draw up a calendar and we'd say these are the schools we're going to target. If nobody like has a contact, if you don't know anybody else, then it's basically going in and saying, "Hi, I'm so and so. This is what it's about, who can we email some more information?" And inevitably what happens is you email it and there's no response. So I totally get it. They [are] doing such a lot of other things like you don't feature. So if you don't know a teacher and you don't have a teacher contact that's passionate about what you offering, you can forget it. And then what I did was I contacted the school nurses and I asked them if we could meet and kind of work together and when they go into the school, we get a half an hour to, you know, bring our message and there was no response. No, so it's province nurses in the school programme. So they got set things that they need to do in the school every year and so they got a programme set out and all the

	vaccinations and that stuff like that are all funded from government. So they got a relationship with the school and so it was those people that I contacted.
5	Okay, so we ask the EHPs of that area to pick a school that they feel needs like some intervention or attention. So basically, it's based on the needs of the school, I would say. I would use the same method. I would look at what, or if I had more than one school in my area, you'd look at like which school needs the most help and which school can we help, because I mean, schools have different needs, students have different needs. So, the one that we can easily help the fastest or have an intervention the quickest and the most relevant to environmental health.
6	I believe it depends on the on the type of project that's been proposed
7	On request. If we should do a school, we would look at what the project is and then obviously which school obviously needs the project the most and also the one thing in my area – I've got no government schools whatsoever. I've only got private schools. I wouldn't say it's pointless, but I wouldn't really do a project at a private school. So I think the answer is: identify the need.
8	What I notice is especially in my case, I have a school in my area, nè, so somewhere and somehow we see if there is a need while you are doing inspections and you see the hygiene condition is not in good standard and then, "Okay, guys, you know what next time since I have observed this and that so I think you are need of health and hygiene project at school." So if I see the need.
9	So what happens is I will ensure that each inspector gets a chance to get a school over that particular year. So if you do not have a school in your area, you adopt a school from another inspector. Then you do the school. So what happens is, if we [are short of] volunteers or who wants to do extra schools … some people [are] more passionate than other people, some people [are] more passionate about informal settlements and some people [are] more passionate about schools, I throw it to them. What we do here at Westridge is we work together at the school so we help each other out as far as the school is concerned. They choose the schools. They approach the schools, ask permission. Well, I haven't heard any school denying us before and then once we granted permission, now we plan it.

10	Our projects, we focus on the primary schools and I would just do any school in my area. Like I have three, but I make sure at the end of the financial year I visited all my schools in terms of having a project. So I just choose the school.
11	So, like for instance, people that [don't] have schools, so we allocate schools to them so X doesn't have schools and Z has four schools so she can choose a school from me and then you know. So (*Afrikaans to English*) she helps with my jobs so she will tell us, "Guys, we need to do, in this office, we need to do maybe six for the first half of the year." Then we have a meeting, who's gonna do what and then that goes to our health promotion officer, then he can also join. So we give them a schedule for the year or half a year to say, "Okay, fine, this is the …", then he can also join, to allocate to those who doesn't have schools.
12	I can only speak for myself. In my area, I will try and do a different school every year, every financial year or sometimes I'll get one of the teachers or the principals that call in to come give health education at the school or I'll liaise with the health person at the clinics. She will tell me, "Look here, [at] this school we've received a lot of hepatitis cases," or she's concerned that there's TB at the primary school. Then she'll ask me to link up with and target that school.
13	Let's take, um, you have to target … let's take handwashing. So there must be a certain school that you see they need more information. So you have to decide: Mannenberg? Nyanga? Which one? Where do you think you must provide more information? Obviously some areas there's lack of information. People sometimes don't have more information. A lot of kids are not going to school. So whoever is at school, we must give them more information so that they can give [it] other people outside.
14	Um, we will choose based on the EHP's area and then, um, also it would, we'd check our stats to see if there were too much high schools done, then we'll focus on primary schools also, based on a need – so if the school … contacts us and asks for some type of project and then also based on the health calendar. The health calendar It's like certain things that you celebrate a month. So maybe when it comes to diarrhoea season. You know diarrhoea normally focused on that 0–5 or 0–6, like the children in primary schools and so on so, then we need to target primary schools for diarrhoea season.

	We get our stats from the nurses/primary health. So when we're speaking with them or sitting with them in meetings, they'll bring up those things like teenage pregnancies are rising because the clinic because … sees the numbers and so on.
15	Um, because I'm new, I can only say if I've never been to a school, I'll go to that school first and foremost and also depending on the kind of area you're servicing. And if you [have] had any complaints, for instance, has anyone actually come because other schools do require projects. They'd come and say maybe invite us and mention that they'd like this to happen so if anything like that happens, obviously we would take on a project. But normally it's about the area of what the area goes through and then also if there [is an] outbreak or whatever. So does it affect which area. I think we look at the problems and the area; if not, then if the school has a project, then you would go to that school.

Appendix 15: Planning Process of the EHP's

EHP	Quote/s
1	Schedule, draw up, inform the EHP; EHP to make date for the intervention
2	So then obviously you would budget to try and source all the materials that's required. That's the hardest and takes the most time. But preparation, I think information wise and that we've built up over the years and so obviously you already have, um, we've actually at some stage drafted like a little on a A4 just to say that you introduce yourself, then you do this, then you do that. So that if there's a new person joining, so that you sought of like have an idea of (*Kelly interrupts:* Do you have a copy? Please can you send it to me?). I can send it to you, yes. And, um, the posters and stuff that we use, we're still using the same stuff that we've used …we actually want to change the poster because currently the poster is still with the Western Cape province logo on it, but we [are] still trying to think of how we [are] actually going to, you know, change it or if we [are] just going to use it as is and then just put the City logo on it. But that I think we need to do … we need to do that now before we do the next intervention later in this year, in October. And then the colouring books, that we changed with the City logo, so that also came from province originally.
3	Um, there wasn't actually a preparedness. We just, you know, I come in early in the morning, get the stuff ready – the colouring books, the soaps and the whatever. They would actually just briefly help me with what we are going to do. I would go and sit and listen to one or two that Z would do and then I will take over. Basically, so that's how we went about [it] with the interventions. So there wasn't a proper way that they prepped me before the time.
4	Okay, so the EHP for the area responsible for setting it up, getting material, planning the programme, and messages they want to bring across. Then they are free to ask whoever to help. So we've like a PowerPoint presentation, it's all loaded on the team site so they can choose a handwashing one or whatever and then they kind of set it up, the logistics of it and then roll out is whatever they want to get involved. Does that answer your question? Yeah, because each school is different. There's different things and sometimes the schools request different things. We noticed a lot of menstrual education

	So more like: What do I with my pad, my used pad? How do I dispose of it? Like those kind of responsibilities. So it's more that than the actual body, this is what's happening inside of me. But that all comes up, you know what I mean (*Kelly agreeing)* while talking, but our focus is on the hygiene aspects related to it and with the boys, the puberty and the sweaty armpits and, you know, like strange things. It all just gets packaged together and so XY was doing something at school. This is funny. So ZY had a school, right, in Lotus River, it's a poor school and she wanted to get in there and then when she went there the principal was like, "What are you doing here?" And then ZY explained this is why she's here and she wants to have a look at the toilets and he's like "no" and she said, "Okay, no, that's fine, but I'll bring a letter next time to show you that it's part of, yeah." Anyway, then she thought she's going to ask X who deals with this school because she was like, "Why wouldn't the guy want me to come in?" and then she emailed X and X said actually she's got something set up. This man asked X to come because they [are] having a problem with the Grade 7s especially, Grade 6s and 7s. Just, you know, how they are behaving and with the whole puberty thing and, um, X was going to go and talk about that and then X said, "Do you want to come and talk about the hygiene things?" and ZY said yeah. So ZY went with her for that, but ZY said that the focus was the puberty thing and there was a need and they contacted X, but X had obviously done other things in the past. But the thing is, X didn't think to ask. Anyway.
5	Okay, so how I did it was I did an audit first, so I will, I walked around the school and saw what was lacking areas of concern in terms of environmental health and then that's how I picked the type of project that I wanted to do.
6	So basically, we form the team and then liaise with the school and inform the principal and then if consent would be needed from the parents – consents are given, and then, yeah, we do our planning and how we gonna tackle the task and we share responsibilities, yeah, and that's all.
7	Um, make contact with the school. Speak to the principal and if the principal isn't available, speak to the head of the department and then sit down and discuss with them what the project is. Um, I've got a letter that they send out to the schools that says everything, um, but when I meet with them, I discuss a possible time and date. So with that letter there is a page that they send back where they accept. So confirmation.

It's also depending on what the project is, if it's handwashing, we got resources, if it's smoking, we now get the lungs from UCT if necessary or if we would want to, |

	whichever EHPs area it is. So then we also identify the school so then we normally ask the EHPs, "Listen here, who has a school we can use?" and that's the thing. Sometimes I go and identify the school or that EHP would go and set up the meeting or we'd go together
8	Most of the time, we will go as a team like maybe a team of four or five so especially if we are going to deal with a lot of children and they need attention. So we just split the topics accordingly to us. Let's say, um, Z is going to do diarrhoea and I'm maybe going to do handwashing or something like that. So like last time we came up with a play, so we always work as a team, we support each other. 'Cause some people, like, when they go there they won't know. They don't have that thing and it's kind of boring if you go there and tell the children, "Guys, don't; you must wash your hands," so you must come up with something interesting. Then the children can get the message.
9	So, um, we will approach the principal. We will ask the principal which grade he prefers. Most of the time when we ask what grade, the principal will ask us, "No, do this grade or do the whole school," or whatever, then we have to try to adjust or try to tell him that we can't do the whole school, we'll do up until these grades. They must organise a particular date because we must work around them (*Kelly interrupts:* Oh, so they give you the date?*).* Yes, a date and a time because you must remember when we come there, "Oh, it's interval; oh, it's this or that," so they will give us a time slot, a particular date and a particular classroom. Once we get that done we come back now and we will start arranging … oh and the focus. So we will tell them basically our focus will maybe on handwashing, diarrhoea, so they will tell us, "We got a problem with lice, we got a problem with …" so they will also … so it's partnering with them because they will know what it is. Then we'll bring in whatever. Now we'll come back and now we'll decide in the office, "Okay, it's my project, who's gonna assist me?", um, volunteers. Whoever's available, fine. Even then, we will decide that it's not always the same and we don't always cover the same topic and sometimes, believe me, when we come there we don't know who's going to talk, but we so into it that we just flow, we just and if I'm maybe talking and I miss something the other one will come in, but not like, "oh she forgot to say this," as if it was part of it and remembering something and if we see the children [are] very focused on that particular day and there's time, they asking questions, we'll bring in other things as well. So even if the focus was on, um, for example diarrhoea and handwashing and the principal maybe asked us to bring lice or person hygiene in and we find out that particular day waste management is a problem at the school, we'll bring that in.

10	You must first go and get a date and set up a meeting with the principal because at some schools you don't just go and get to speak to the principal. You must go and set up a meeting and then the principal on that particular day and then the principal will maybe call the coordinator that is heading that particular project. And then you call the teacher, you set up a date and then sometimes the teacher is the HOD, so that teacher must communicate with other teachers and then they would agree on a date and then making sure that they will also be around the time to check maybe it's not during the exams. You understand what I'm trying to say? And then, if you agree on that particular date, then you come back to the office, you prepare your documents. If you wanna involve your colleagues because you do things maybe as team. Always go to the EHPs and EHA. So you go with the EHA with the material. If now you are going to do the handwashing you must have your handwashing stuff ready, your pamphlets because you like giving pamphlets so they can take it home.
11	So, once we've chosen a school, we make contact with the principal to ask for her permission and then obviously the classes that we want to target. And then she will allocate a date for us and then from there we go back to the office and then we prepare, if we have goodies or whatever. Then we prepare our goodies, normally it's nice to do projects with the team, it's better that way. Then it's not so boring, doing the same thing. "Okay, maybe let's do her way of things, maybe she's better with children and Y has her thingy or whatever," so we have meetings and say, "Okay, fine this is the yearly whatever, who's going to assist me or come forward?" I don't say you, you or you and whatever. Come voluntary. Then we go as a team and it goes quickly as well, whereas maybe for instance, say you can't have all the grade threes all at once so now you have two classes, two classes, two classes. Then (*Afrikaans to English*) you and I are going to do these two classes and you and her are going to do those two classes and so on.
12	It honestly depends on which grade, so we mainly target the young ones so that they can be briefed when they progress to school, um, basically just your resources, your handwashing pamphlets, diarrhoea pamphlets. We also incorporate toilet hygiene 'cause they naughty, the small ones, so we ensure [we say] how important toilet hygiene is because you sharing the toilets with a lot of friends or whatever. If diarrhoea season, maybe issue the diarrhoea bottles and show them how to make the squeezy bottle so it's also like an activity for them. And obviously link up with our health promotion coordinator just to assist in getting all the resources.

13	We first discussed like who's going to do what? Who's going to do the talk? Who's going to do the demonstration? And then after that, when we're there, it just happens like (*laughs*). I will talk, talk, talk, and then I would do the handwashing and then we'll do this and this and that. We'll first talk about it before we go out to the interventions, so like who's supposed to do what.
	Like which materials are gonna go? (*Kelly agreeing*) 'Cause we must not give irrelevant information. We must take something that is relevant.
14	Yeah, we'll do, um, if necessary, we'll contact sister departments, um, the line departments. If not, then it will just be us together with primary health and then somebody at the school. So it will either be the deputy principal; if not, the principal and your counsellor; if they have a counsellor, then a social worker will be on board as well. Then we'll have our meetings and planning sessions before the time. If it's a school and it's a small project of just about 100 children or a certain grade group, then we'll just have like two meetings before the time. If it's a bigger project, then we'll have much more meetings and find out who's the department – if we not arranging it ourselves, then we'll arrange the other departments
15	Yes, they arrange a meeting, you send an email to say I'd like to meet on a particular day at a particular time. We haven't been that great with admin, but we're trying. So we get the register ready, for instance, minutes – not really (*laughs*) – we want to get them, but yeah (*laughs*). Also it helps with the IPM (*Kelly agreeing: Yes*). So normally we meet in my office, okay, it was a bigger office and it was my own and, yeah, it was easier. But we'll meet and the agenda will obviously be stated about the project, but it's when we meet it will basically be about brainstorming. So it's not just about me, EHP. I just could even come and it's all of you. I could just present a situation, if there is no situation at all, then what would we like, like things, like what's going on, what would we like to do, how would we like to present it differently at that time if there is anything to offer. So normally our sessions are first and foremost about brainstorming, what do we want to do differently about improving basically.
	Yes, so you will have some people who are connected and know people. So you already know Y knows that organisation, so if it's relevant with this one, Y is going to liaise there. So resources, they'll know if there is any CT health promotion material, I'll take it. But if it's anything else outside of that and if we can delegate [to] you or have a relationship somehow, then we actually ask you to do the whole process [for] further guidance.

EHP	Quote/s
1	(Laughs at the question) Asked, "Do we have legislation? Don't know of any legislation – just told there is a PDR and we must do it."
2	I haven't thought about it that way (*laughs*). The national norms and standards tools, that's now recently and obviously now that we need to do inspections and things as well, you know when [the] province used to do that Well, that would obviously be all the facilities. It would be the size of the classrooms; you know, that it's not overcrowded, the ventilation, toilet, pollution, facilities, the feeding schemes, kitchens, COAs, which obviously brings into the Regulation 638 and all that.
3	No, The thing is, I have to honest, I haven't gone through the policies for the schools yet because I'm not really doing schools. It's mostly X and Y that's got the schools under them. So I haven't done that, to be honest. SOP for events, no, there was only policy and the by-law, but not the SOP. Is there an SOP on the events? (*laughs*). So it's only the by-law on the events.
4	So, to my knowledge, for the feeding schemes, obviously it's food education so COA, applied through COA and getting the staff trained. I've actually done a few of [those]. But in terms of, like health promotion, to my knowledge I don't know a formalised piece of legislation where we as EHPs are supposed to be going in and educating. I'm not familiar with it. Oh, yes, and then obviously the norms and standards for the sanitation audits.
5	Not that I know of. Yeah, I don't … I think there is one. I just haven't come across one. There probably is a regulation (*laughs*). Like I'm thinking about it now, there probably is one but I haven't been reading. So that's on me. I'll take responsibility for that.
6	I'm not aware of such. Well, from what I know, what I've done in schools is basically using 638. Basically for in the kitchens, um, your food handling, your sanitation of the toilets, the facilities. If they are adequate and in a good condition and they pose no health hazards to the kids or staff and the school.

7	No
8	I can say 368 but not more … what else?
	Since they also have, um, they prepare meals, some of them also use that when we go to schools 'cause I remember when we have this health and hygiene five keys, we go to schools, except I don't have schools in my area so when they go there I think they also target the food that [is] normally prepared at school.
	Since we also do waste management so I think … what's, um, the legislation for waste management?
	Besides 638 (*Kelly agreeing*), um, (*laughs*).
	NEWMA. National Environmental Waste Management Act. Something like that.
	Not really. You know what, like us EHPs, I wish we could be more exposed to like everything even if it's not in your area so, because when I come across such a question I become so limited like I don't have more info or anything about that.
9	Not really.
	The food. The food safety we doing now with the kids. I've been using, recently, mostly, the regulation 628. I haven't used the by-law by the school. It was needed so far. I used that, the 6 … 2 … 8, the 6 …
	638.
10	At the schools because we inspect their kitchen so we use the Act 632 to inspect the conditions in the kitchen.
11	The usual one that we normally use to do inspections, but I mean we, it's never … okay, they give us resistance like it's never like I have to go quit … this legislation. It's just the normal thing, like, okay, we have to go out in the normal … yeah.
	No, I don't know (*laughs*).
12	A policy maybe? The health promotion policy.
	Hm, not that I can think of.
13	Yeah, I remember when I got … they gave me a lot of legislations to read. Like read this and this and then sign. I don't even remember what that one was for the interventions, but we did read. You must read everything. Go through everything, even if you not reading page by page, but yeah.
	I don't know. I think so.
14	No, not that I am aware of.
	Um, what is it now for the building regulations, and then I don't know where that information comes from, but we got it on a separate document, requirements besides the by-law now, the requirements for ECD in school, places of instruction

	where we, you know, those requirements that says you can, the sand must be this or the playground must be of a certain size – not sure where it comes from.
15	Um, I think because I've been exposed to doing such audits, I don't even remember which legislation guided that. You know, I have to look for this, and this and that because I've done it for a while. Truth be told, I don't … (*thinking*) but there should be one.
	I don't really want to answer that because it could be me. I could never say it's fair (*laughs*). I just don't know or I don't use [it] as such (*laughs).*

Appendix 17: EHP Portfolio Holders

EHP	Quote/s
1	Coordinating projects for the Maitland office, attending meetings; drawing up schedules and reports; does a lot-thinking; COMBI tool used to verify and submit interventions; monitoring the projects; communication back-and-forth follow-up that projects happen
2	Yeah well, EIA, for instance, is the one that I do. Then for our office, X does the legal proceedings, but I also do, sort our office for the capturing of that. Yeah, to keep track of that. Then I'm going to do the events as well.
3	At the moment I'm just helping everyone out. I don't know how you go or how the City goes about, um, I've never done a portfolio with someone or no EHP has shown me, "Okay we have a portfolio for the ECDs or a portfolio for whatever project we doing so …"
	I didn't know there was like a portfolio for each EHP and is responsible for whatever, you know. I didn't know about that but thank you. I will ask them actually.
4	So health promotion, that's mine in the office.
	Okay, so I coordinate the calendar, who's doing what, when. Then people submit their tools and reports and things to me so I'm constantly updating the calendar on the team site and putting the evidence there and then obviously you bring with the other districts. So X attends and I am included in that communication process. And then I also assist new staff who are unfamiliar with things. So, yeah, I help them with their projects, mentor them with how we do it or what we want to achieve by

	doing it rather. Um, and I also report to Y when he needs information about stuff, stats and things like that.
5	Um, kind of. I'm learning the different portfolios.
6	Not yet (aware of the portfolio, only 6 months in the job)
7	You know the health promotion Not directly. But I assist with other things as well Well, I'm planning the teambuilding next week. Then I do the mileage. I assisted X with his water. I assist everywhere So the main thing is planning of projects and I am of the opinion that I don't plan and inform the staff, so whatever planning I do, I do it jointly with the staff. I also do a lot of the logistics; however, if it is not in my area then that area is the EHP's responsibility
8	I am an assistant with the diarrhoea portfolio. And then there's this, it's not a portfolio, it's just internal; we have this problem area with is town centre so I'm coordinating that as a portfolio 'cause it's not like … So X is the major, so if she's not there or if she's on leave, I will be the one who conduct the diarrhoea reports or go and attend the meetings.
9	Right now I am doing the health promotion and I'm doing the ECD portfolio and I'm doing infectious diseases, diarrhoea. Okay, so for my main portfolio is health promotion so I'm responsible [for the] coordinating of the staff. Remember, we two officers so I coordinate not only for Westridge but for the whole Mitchells Plain, but specifically for Westridge. So in other words, the project planner has to be in. I have to email the person on the other side and ask them for the project plan and make sure that the project plan is in. Whether they do it or not has got nothing to do with me, but I make sure that it goes in. With regards to the projects itself, I have to ensure that we meet our targets. So whatever the inspectors put on there, it's my responsibility to ensure that they reach the targets. I must also, at the end of the month, I've got spreadsheets on the spreadsheets I will say, um, what particular project it has been, whether it's informal settlements ECDs or whatever and go as far as dividing it up into council and ward. So that's a share point and everybody has access to that within our district. Well, that's got access to that share point. So that's my responsibility, and ensuring that our targets are met because I need to answer for that.

10	Yeah, it's diarrhoea portfolio that I have.
	What we usually do is the public will go to the clinic or when the child is sick and then the clinic must send the stats to us it it's a severe diarrhoea case. So they must send to us so they forward it to me and the coordinator and then I will distribute it to the inspector that is doing that particular area for investigation and come month-end what I'm doing right now, like the third working day it must be in. So I must collect numbers, like how many cases did we get, how many did we investigate, how many deaths and yeah. I also attend meetings.
11	Yeah, first of all, I did the food and training and environmental functions
12	No, not structured portfolios. At the moment, just before X, left I was given the task to manage the events like incoming and meetings and all of that.
	Oh, just to manage all incoming events to ensure that the EHP obviously attends the meetings and the necessary documentation is given to the applicant. Like the noise exemption or we'll receive the COAs or copies of the COAs and if it's a huge event to ensure that they are there for inspection, so yeah.
13	Yes, I'm currently doing infectious
14	Yes.
	Um, dams' portfolio and events.
	For events, it's just to handle all environmental health-related aspects of events and then to attend the meetings and things and to appoint staff if needed for overtime (*Kelly:* Oh). Then dams would be the quarterly report, you have to do a quarterly report and then assisting the staff with dams' issues and then following up on plans that was circulated.
15	Projects and what's it, health promotion projects, and not viable medical conditions, but in the meantime, I gave that away to X so that she can have some sort of responsibility as well. Something to brag about when she leaves (*laughs*).
	It's just looking at the calendar and adhering to every expectation. There are plans that are requested by the director, by their office or internal settlements in every quarter. So taking care of that calendar basically and making sure that it is available for everybody to use. The ordering I don't do myself, but I'm the one who obviously checks what's in there and what's not in there. Then I will speak with Z, the line manager, and Y, the health promotion officer. So, yeah, anything about health promotion. So if you are going to have a project in your area, you don't necessarily have to go via me. It's just a matter of we have a tradition, we do all our projects together almost. So if you do have a project, set up a meeting, it doesn't have to be

	me, but as long as I am involved and also when it comes to submitting project tools, you can cc me in and send it to B for approval. So that you just don't do something on your own, we're there to ask. If there's a project and we're not informed, it's not like I'm the police or anything, but it's just taken care of. So I attend meetings as well, meetings that involve health promotion so I would give constant feedback to the group. So that is important to me. My responsibilities, so yeah, man, plus minus that's about it, just making sure that we adhere to the calendar – whatever we still want to add and the material.

Appendix 18: EHPs understanding of Monitoring and Evaluation

EHP	Quote/s
1	COMBI tool, summary submitted to HPO, there is no real outcome; need to evaluate what we are doing – do interviews, a lot of projects, but no real outcome; no analysis of the EH health promotion in general; EHP is doing a lot in general, but what we doing is not being analysed – they come up with targets based on what? We have data, but is it effective.
2	Well, we put it on the COMBI tool. Then it goes back to the school for a stamp to say that it has been done there and then it's submitted.
	We did two years ago; we did a questionnaire. That was quite difficult because the children are very small. I mean we only do the Grade 1. We used to do the Grade R and Grade 1, but then we realised that the Grade R, they [are] definitely just too small.
	Currently, we don't have. We tried also in the past to actually ask the school nurse whether they have stats on, but they don't keep specific stats on, you know, whether they had so many cases of children with, you know, worms. So, it is a bit difficult. I must say, she actually told us now recently that in between May and October then they hand out the tablets. They actually did a pilot project, a test to see whether the children had worms, obviously school samples that they collected and I think 60% of the children had worms and that was even with the deworming (*Kelly shocked*). The correct, I mean percentage-wise and that, I'm under correction, but I can I can ask her what the specific percentage was.
	We didn't really do anything, but that was then submitted for that Afred Nzo award. So that was used for that, and it was just to show us as well that we're not wasting our time. Because I mean, it's pointless doing something and nothing happens.

3	I just send them to, you know, if Z did a … (*speaking in Afrikaans, translated to English*) a report and I send it to her. If she wants to use it, it's up to her. Same with X, ZY, and me. Just for …record purposes No, no. So, according to my knowledge, there was no evaluation from the teachers' side. I don't know whether X did after, you know, sent emails or whatever to the schools for the teachers, but there was no evaluation afterwards from the teachers' side
4	the standard thing is the COMBI tool to complete, but then once it's done, then you write up. But it's basically, background, why you went, what was rolled out, how was it experienced by the kids and then evaluation. What would you improve on? We don't really. It is not a formalised thing (M&E), um, it's like I always say, get feedback from the teachers in the room, get feedback from learners and also like you've given them all this information, then we normally do like a little pop quiz at the end, who can remember this and this and this? So, we used to give sweeties, but we don't anymore because it's against policy. So, but now we give rulers and things to give out so that's great. So, it's evaluating how the children experienced it. I think we lack in how it was put together; do you know what I mean? So, I always feel like the school needs to give feedback as to how the school was approached, how the process was, setting up the date, the time. But I mean like we don't have anything like that
5	Oh, so you do a, what I did is I made a project tool where I describe my project and fill information on what my project was and how I was doing it, how many people did it target, where there any other departments involved in my project, yeah. So I submitted a project tool to X, who then sent it to Y.
6	Not that I'm aware of
7	So, it would be the name of the EHP that did the intervention, um, the name of the school, the address, it would ask if we were the initiator or not. It would ask what the project was about and then also what the outcome of the school was and how we would evaluate if the project was effective. So, the thing with schools, especially [with] handwashing, we would look at the amounts of diarrhoea cases that go to the clinic or how many diarrhoea cases get reported. Um, so like, yeah, if the information comes from the clinic, you find about if this child is from that school or if it's an influx of diarrhoea cases. If it's one child or if it's twenty children and if you don't get any diarrhoea cases, then it would prove that the intervention was effective.

	So, evaluation would be normally what I do … we would play a game with the kids afterwards. So, you'd ask them questions to see if they took note of what you were saying. Yeah, so you'd ask questions afterwards and throughout, also just to see if they [are] actually paying attention and they listen to you
8	So, we use a tool, that COMBI tool. Like there are some questions at the bottom where you put your address and stuff and your target and then how did you pass the message, what material or whatever. What did you use in order to conduct the project and stuff and do you think the project was effective and how do you may sure that it was effective, that kinda stuff? By maybe going back and you do your routine inspection and check that what you have been taught is practised. I can say we do that. Depends, as I said to you, after we done the projects, we do the COMBI tool and then after that a few days or whatever, then you'll go back and do your routine inspection, especially if, let's say, there was an outbreak and then later on it was like sort of like now. Since the problem, like there is a need for us to go there and do such projects. After that we go and monitor if, um, the information that was given is being practised. That is how we analyse or monitor
9	The health promotion tool is basically something that the City of Cape Town has come up with, so once we've completed with a project … so basically a tool to, um, in there it will give you, um, how do I explain the health promotion tool? Um, there's a plan beforehand and there's an after one. So the after one it's … what [were] your objectives, was your objective reached *(thinking and saying out loud:* I'm trying to put it in words now). So basic details is in the tool, the name, the address, the wards and you know it's easy for me like to do, but it's basically to measure to see if you've reached what you have set out to do; you accomplish your goal. So if you went to a particular school, did you carry out what you were intending to? A measuring tool for you. Yes, yes, no definitely, so you can see also what was lacking and you can improve on that because you must remember each area is different and each school is different. So if you know you lacked on that or you can see the children are just not or the grade, you can know if you go back there again to that particular school, where you need to improve and it's a monitoring tool so you can use it as a monitoring tool for future as well.

	So say, in other words, form there basically you can pick up certain things, certain questions of the children. You know what the needs are then. So if you go back, so if you compare to that and you still feel, listen here, these children … you know when you speak to or the teachers, you can see the teacher's just not there so you need to give the school more attention. So you can always go back on your own again or make regular [visits] or more giving more attention basically. That's what I feel. And improve. You pick up certain things as an inspector and [what's] lacking or you didn't reach everything that you wanted to and you know the school needs more attention. You can see sometimes the school doesn't have everything, but they want to improve. That's where we can help them.
10	Like, maybe how did they receive you? So it will always depend on your assessment as an EHP cause you get to know whether your audience received you well and also by the questions that they ask and also by the answers that they give if you ask them questions. Especially when it's kids. You will say something to them and then ask questions based on the topic. So the interaction will always tell you was it effective and the enthusiasm

I'm not too sure because we submit that. So I'm not too sure maybe they take that information into consideration for improvement. I'm not too sure.

We just submit but whatever challenges you encounter or whatever you learn from that. You know maybe next time, "Okay, I must go through it maybe." Maybe the challenge that you had last time was that you didn't even get a date at all because it was towards exams, so they will compromise. So you learn, okay, I must do it beginning of the term or mid-term so you learn from whatever challenge. |
| 11 | No, it's on our database. (*Afrikaans to English*) so what happens is, so we got the roster … so she would expect that tool for that month. So then I would issue or give her the tool and she's got my site on the schools so to show that, that school is done there. So whoever's got access to our things so maybe, for instance Z, he can also go check how many schools were done. If I'm not there or Z's assistant isn't there, then anybody can go and see how many schools we did, like that.

The health promotion tool. We've got a health promotion tool that we use to say where, which sub-district, who initiated the thingy, what was the topic about, what was the equipment things you used, materials and all those things. That's all the information and the target groups, the age groups. Whatever, whatever

To be honest, in a school, because it's like once a year, you don't actually go back and check, okay, only if maybe, only if you did the health and hygiene project now and obviously you need to inspect the school again, now you can see you spoke |

	about toilet hygiene and whatever and whatever. Now you can see maybe it's afterview, maybe go back to the school and speak to the school or whatever, that's all way, but we don't actually go back and check if it was effective or whatever ... that's the other thing, a shortfall from our side.
	Oh, it was the sanitation audit, solid wastes, yeah. And because of this, I don't know if you heard about the school … so when you do go out you must do a sanitation audit and you must forward it to the Western Cape Education Department about the whole school's businesses.
12	Using the COMBI reporting tool. We take pictures as evidence also, yeah, and submit it to the health promotion coordinator.
	What you did, where you did it, why you did it, reasons, outcomes, was it effective, did it bring awareness, how many people you targeted, the age group.
	Not necessarily. I wouldn't say a school project is necessarily measured because we only do it once a year. If there was maybe an intervention that needed assistance, like if I link up with the clinic and she says, "Look here, there's a lot of hepatitis cases," you'll target that school because there was a school that had quite a few hepatitis cases and then we'll target that school but then our link, we'll still link up to see if [there are] any more hepatitis cases, maybe in two or three months.
13	What do you guys call it? A health promotion tool?
	Like where did you do your intervention? How many people were there? And pictures as well and whose EHPs were there and the outcomes.
	Not really a lot; it's just like how many, the day, the date, how many were you, and how many people came. Yeah, those things, yeah.
	When we come back, we have to talk about. So [we] discuss [if] what we were trying to achieve happened or was it not. So, we try to make sure whether our project was effective. By making sure … before we go, "Okay, this we have in mind, how many people we want to target." So, when we come back, the registers will be signed so we see how many people came so if it's almost there, the number that we had, like we must target this amount so obviously it will be like we achieved our target
14	There is the pre-planning, then there's details of the project itself: we identify the needs and identify the challenges and you have an outcome. Then the last part of the tool would be your review project. What were your shortages, what were your

		challenges, what were your needs, did you reach your outcome, did you meet your goals, your target? That kind of thing.
		That is actually one of the challenges because one of the principals one day asked us how do we measure because we can't actually measure, we're not sure how to measure the effectiveness of something. With the clinics it's [easy] enough because they do family planning and see that there is a reduction in teenage pregnancies, there's a reduction in children coming into the clinic. But for us, for EH specifically, handwashing maybe, I don't think we're familiar with that. We'll see a reduction in, let's say, diarrhoea cases in five years, in children under five, but we [are] not sure if it is actually teaching people handwashing that is contributing to that or if it is other factors.

Monitoring, no, not that I'm aware of. |
| **15** | | We do project tools if that's what you mean (*Kelly agreeing*). After every intervention, we'll fill in the project tool with all the information, what you needed, resources, the outcomes, how [many] people there were and the engagement, for instance, if they looked interested in a particular topics and all of that, who was there, what they did. That's how you would fill [in] the project tool. So after that, you would send it to X, the HPO, for approval so if there is anything or [if] he is not satisfied [with] how you filled in the project tools, then he'd obviously advise [you] what's lacking or what you should do and then it will end up at the health information officer. Then it's stamped and kept by the (*Kelly interrupts:* Who stamps it?*)*, the line manager, after it has been approved by everyone else. So we know definitely it is submitted and then she'll keep them.
No, I'll say no because I don't know any of the measures. For instance, I haven't gone back to the schools that I did, like where I'm staying for now. It can't even be an excuse. So if it means we have projects, you can always go back.
When it comes to schools, no. Because, for instance, in the informal settlements, you would see in your hot spots where the notifiable medical conditions are, but with a school, the schools, it's like you only go once; your sanitation visits and you only go once, now it's a project or once when whatever happens, you know. You only go on events so it's not an ongoing monitoring. So we don't have that even though we've had discussions that we'd rather have quality projects than quantity of projects. Doesn't matter if your projects and you can see if they have an effect or not 'cause you never know what to improve on the most. |

	What's nice is that the best we can get for evaluation is we go back to a school we have been to before and intervention, then it's better when we come back because for some time the behaviour changes, you know, and it's even better for someone from outside to hear it from the teachers. So that's the best feedback – that after interventions there is some change. So [what] I'm saying is if we had to go back to a school or if they want a project or something, after an intervention, there is some change in behaviour to the learners so we don't have any measure for us to go back and see if there is anything. But from the teachers, now that you were there, after some time the behaviour changed. So they actually promote us going back more, so it becomes tradition or so to speak and not just a once-off, and they feel it's better when we do the teaching than them. Any kind of behaviour.

Appendix 19: EHPs methods of conducting an interventions

EHP	Quote/s
1	Squeeze bottles, pamphlets; demonstrations and have a Q&A afterwards; submit COMBI tool according to regulation.
2	Um, we used to use the flip chart, but in the classroom, I find that it is actually too far for the children to see at the back and if we give them too much [information], then Yeah, they can't really and they sit there and look at you and they might hear something, but they, where if they [are] in Grade 1 you can immediately see there's a difference. Like they respond. So we did a questionnaire before and after. But it was difficult to draw up questions because some of the stuff is quite obvious and you can't make it too difficult because then they don't understand either. So, you actually need to assist them. So then we took like five children from each class and they did a pre and a post and then you actually got the correct and incorrect answers and you could see that, okay, obviously there [are] more correct answers after the intervention than before. they sort of like also lose interest. So, we try and keep it simple, but, yes, I know we used that page from the flip chart … I forgot what it was called.
3	Um, we only use the posters. We only use the posters and then we do a practical demonstration with handwashing. You mean the … we have a bucket for the water and then we have the soap and the paper towels. Yeah, that's about it.

	No, no. So we didn't have the squeezy bottle. Just because we went there to do the demonstration so we only had to use a bucket. That's what X told us. We can just use the bucket and then we have the water, so we will call out one classmate and then give a demonstration to the children on how to wash their hands. It's not running water.
4	I think it depends on the EHPs and some people are doing it to meet the target and some are doing it because they're passionate about it. So, the amount of effort that goes in, but we like to do, so a typical session would be like we come and we talk about germs and what it is and that you can't see it. I put my sunglasses on and then I turn it on and, you know, I freak out when it's full of germs (*Kelly agreeing*) and they can't see it, that whole "you can't see germs but they're there". Then we play a game with the glitter and/or flour, whatever we have in the office really and it's how germs are spread. They put their hands in there and it's like handshake, high five or hug, but you run around to music, find somebody high five, find somebody, hug, whatever, and then it's how germs are spread. It depicts that, and then we do a demonstration and we first ask somebody to come and wash their hands. Then we ask them: "Does it look right? Are the germs still on?" And then most of the time the kids are very much, they know how to do it but then we do it together and we sing a song and then we'll do a PowerPoint, wrap it up kind of.
	I'm not keen on pamphlets. I feel like it's a waste of money. I'd much rather buy soap for them and send them home with a soap. But we do give out pamphlets because the City provides them. We normally leave it [with] the teacher and she pops [them] in their bags and also we target the younger [kids], so like Grade R and Grade 1, um, the Foundation Phase. That's our target audience.
5	Okay, so I an interactive discussion with the students to kind of get them to do some sort of independent thinking, um, with the demonstration [to get them] involved and questions as well to answer. That's what I did
	It was a handwashing demonstration, washing with clean and dirty water and the questions, and also ratings of how they feel about, 'cause my project was based on sanitation, so my questions were based on asking them how they felt about their sanitation and what they can do to improve their sanitation conditions as the people who use it (*Kelly agreeing*). So I gave the pieces of paper and things to write and rate
6	Normally, we, um, with kids we do it verbally.

	You remember that day we had our basin, so a towel and also those germs that we illustrating and, yeah, and also posters and pamphlets.
7	Personally, I've only done handwashing and that was done in conjunction with the sanitation department. So it wasn't a PowerPoint it was the verbal and the visual that we done. Yeah, the tippy tap, the germs and then the pamphlets.
8	It's more like demonstration and verbal. Normally we target the Foundation Phase and Grade R, Grade 1, Grade 2 and 3 and it depends. Posters and squeezy bottles.
9	No, we use it and then also, Kelly, we used to give in [the] past each one a leaflet, but we found that it doesn't work because at the end of the day they're wasting the money. So what we do is we give it to the teacher to post it up in the classroom and it's there. We'll put it throughout of the school in the corridors. We'll ask them to put it in the corridors, in the halls and things like that.
10	It's verbal. Most of the time it's verbal. We have a form that we must complete when we come back. Take pictures as well and then we must make sure that the teachers must sign the attendance register. So you come with the attendance register and take the picture and then you attach it to the form so that you can read about it on this day and also indicate if it was a success, what are the challenges.
11	It's verbal (*Afrikaans to English*) the children aren't so … okay we don't have the technology for PowerPoint. If the school [has], then we use [it], but we don't have so it's just verbal and demonstration and the acting. So, yeah, we do that. I think squeezy bottle demonstration to wash your hands and (*Afrikaans to English*) those types of things
12	It's just verbal most of the time or sometimes a play. Acting out so the children doesn't lose concentration. Sometimes it's the big A3 posters and they post it up in the classrooms. If we have available, the handwashing stickers, we'll give that as well to put by the basins or the toilets and obviously if it's the little ones, the teacher would hand out. If we have enough small pamphlets, to take home – to give them to take home to their parents. So the squeezy bottle we take … or we give one per classroom so there is one actual one squeezy bottle in each classroom.
13	Verbal. I can say verbal illustration. Like we demonstrate. That's all. Like we must show them how to do the handwashing.

	We have the squeeze. Like we have the squeezy bottle and a bucket, like a tap bucket and then soap obviously, then we do handwashing as well and a paper towel obviously.
14	it normally depends on who we are presenting to. If it's high school, then it will be more formal; if its primary school, it will be more interactive and more verbal with some demonstrations. We do have a PowerPoint, if the facilities are available. If it's not available, we'll have some type of structured programme where we will go through that programme with the learners. It also depends because with the high schools, we try not to use pamphlets because they just throw it away (*Kelly agreeing*). With the primary schools, we'll give it to the teachers, the pamphlets and things, and tell them to, you know how they normally print and put it in an envelope? (*Kelly agreeing*). So we give it to the child and just send it to the parents. It's recorded on the project tools and they we'll just attach evidence like pictures as well and then we'll get signatures of the children or some type of register to keep count of the numbers and then, um, yeah, I think that's about it.
15	It's verbal and [we used an] illustration. So it's like handwashing that would include your food and all of that. So, like, we use this powder that looks like flour that is green, so obviously when you touch a bottle then it will leave a stain and show you when you touch a bread, it will still be there – but just to show them that you won't see microorganisms as they, yeah (*Kelly agreeing*), so when you touch this, when you touch a ruler or put it into your mouth and [are] eating, that part that that person touched. That type of illustrations, um, mostly or currently. We'll put up, obviously depending on, we do have our corner, even if the theme is handwashing so we may have a note back there, we may have illegal dumping, we may have that in the background even though we're not going to use that. The flip charts that we have [are] the water control and diarrhoea so we use flip charts. In my case, I haven't used it. but you can see. Even the stuff you want to talk about. Even sometimes, their attention is not there so as long as you [are] reading something, so as long as everything is available. So we would have pamphlets as well, but ideally not for children because it always ends up in the dump. So by all means, we always try to enforce speaking clearly to the children and then leave posters for the teachers, you know, to put up in classes or something like that and have some pamphlets, like

| | available at the reception if you're interested, then you get but not just distribute. Not always but sometimes.
: I know the handwashing; no, I think that's it.
So that would be the touch with the powder and then you show them how you actually wash your hands. We have a squeezy bottle, which we also teach them how to do to manage water at home. So you'd have a squeezy bottle and a bucket. You'd have a paper towel and you would have soap. So you would show them how to wash their hands physically, from water to rubbing your hands with soap, rubbing your hands, rinsing and with the paper and throwing in the bin, emphasising that and making sure that they take part [in] the actual activity. So it would not just be the EHP at the school doing the handwashing; we make sure that the children do take part. |
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Appendix 20: Interventions and behaviour change

EHP	Quote/s
1	Start at the grassroot level, done at the youngest age; need to analyse, discuss with the people of the interventions (get it from the people); research their needs and wants and then start with the interventions.
2	They need to understand the message-bring it across at their level, basic and not too much detail You need the teachers by-in
3	Starts with the children, example finding out why don't they wash their hands or dump
4	If we have somebody who is responsible for health promotion [and] that is their sole purpose, that is their only job per district. Coming up with a strategy, a plan and rolling out and being able to monitor and take information and use it – that's the only way. A budgeted position with resources and sport. I think that is what you heard from everybody. There's no communication, even [at] those meetings.
Okay, so how I would've done the follow-up is that I would actually involve the principal in the sanitation audit, well a follow-up audit and show him what exactly is what we look at and see "okay before" and I would do the audit with him so that we can get a common understanding of what is wrong and what is still wrong and what has been rectified. Then based on what has been rectified or what is still wrong we can come to a common conclusion to say like, "Okay, this is our responsibility, the students' responsibility," and then if we see that it's the students' responsibility, get more students involved and go to younger grades, um, Grade 6 and Grade 5. Involve

	more students in the project. I think to equip them from an early age, to take responsibility for their sanitation in school.
5	I think speaking to them like proper people, like not dumbing down your project. Like telling them, "These are the hard-core facts." Also not being too like harsh about it, but also being realistic like, "Guys, this [is] what's happening, why is it happening?" That type of approach and also just to have a little bit more like children are encouraged by nice things, so if they get rewarded with stuff. So if we had stuff to reward the kids with they would also be encouraged to interact with us more and be open to listening to us more because then you know that they're going to get something. Yeah, you kinda have to bribe your way through with it (*laughs*). But it works. It's a sad thing, but it works. I'm being honest.
6	Well, education. Reaching out to them and doing the projects and the interventions. I believe that plays a role.
7	I'm thinking it depends on your age group because it's … if I look at the younger ones they always more excited and they always more willing where the older kids they don't really. But I do think the way that you are going to change their mindsets is in your approach and presentation of whatever you are going to present to them. You as the presenter needs to captivate them, which is sometimes not the easiest thing to do cause you go there thinking you going to captivate them then they just don't care
8	Like I told you, even children, even people, they like freebie stuff so if they see there is something so you're going to get more; there are more attention, you see, 'cause you just gonna go there … that is why we end up like as a team so that it will be more interesting. Let's say I got to a school like I'm just going there alone and be like, "Guys …", it's going to be kind of boring and then I'm going to be talking about one thing like, "Okay, guys, and then now I'm going to show how to," but if you go in a team you come up with different ideas then you have different ways how to do this, you see.
9	So that's a difficult one because you must remember they go back home. We don't know how the circumstances are at home. So we basically teach them. Like even … it starts with you, it starts here at school. If you see your friend do it, for example, throw something on the floor, you tell your friend pick it up and if they don't want to pick it up, you pick it up and throw it in the bin. Like we gave an example of us, like I saw maybe Kelly throwing [something] on the floor and I told Kelly, Kelly don't want to, so I show Kelly I am better and I did it and now Kelly is shy so Kelly starts doing it also. So it starts with them and them teaching their parents. They like to say, "But

	my teacher said so," so that's a good way to start 'cause now they go home and [say] "Mommy, my teacher said you mustn't smoke in front of me; but mommy, my teacher said mommy mustn't send me to the shop to buy cigarettes," so for me especially the younger ones, start there. What was the question now? So they [are] young, you can and I believe we go regularly. Evens if we reach one person, we reaching somebody and that person will maybe like have a friend or the teachers' evens because when I go there, I speak to the teachers also. I will say something and I will say, "Right, teachers, you can also do this," so like I say it starts with them and evens if we reach one person and take it forward.
10	So I think I can change their mindsets through education because when you educate them, because these kids are ready to learn so they take whatever you tell them because I always tell them, "Whatever information I am giving you, take it back home." Like for instance the handwashing, they didn't know the importance of handwashing. They didn't know it maybe leads to diarrhoea or serious effects. I always tell them if now you have a baby at home, "When you see mommy changing that baby, you must make sure. Mommy, did you wash your hands? Because at school they said we must wash our hands." You understand what I'm trying to say. You must trust kids with that message and take it home. They will take it home because this other day apparently my son at school, they were being taught about traffic rules and stuff. So the other day I drove through an amber roads. The robots were amber. Sjoe! My son went on like, "Mommy! Not on the red robot. Go back. Go back, Mommy." Because that is how they are taught. So maybe the teacher will show a red robot and they must stop. So if you made a mistake, you must go back. And I had to apologise to him. So I thought, yeah man, if you teach these kids they will take the message back at home.
11	Shame. It starts at home, man. So, okay, you can go out and you can educate them and show them and tell about toilet behaviour but it comes from at home. Because if you're not going to do it at home, how do you expect him to do it … and they don't appreciate what they have at schools. So everybody just uses things and they break it down and whatever, whatever. So if you don't wash your hands at home, you're not going to wash your hands at school. So I'm going to come tell you to wash your hands, you are going to listen, it's interesting, but you know you don't do it at home so why must I do it here? That's the other thing, man. And especially the schools in our areas. They come from informal settlements. There one toilet for 20 households, you understand? That kind of thing. That's the other thing; the problem that we have. It's not like at Y, because at Y, it's nice hand (*makes wind*

	sound) …we don't have that at our schools. They [are] going to break it or they [are] going to steal it. Now the teacher must go with the child, give the child a bottle or hold the sanitiser. Different environments, different schools, different areas. So I have a school in Y area that's top notch. It's like Y or even better than Y because they get money and you can see also, man … I don't know if you can see that school in X, it's posh. If you go in there … everything is just so pretty. It's like phew! Wow! But because the people have to pay money. At Z they have to pay R500 per year, whereas if you go to Z you pay R100 a year. So they've got money to do things at school.
12	Kids? (*Kelly agreeing*). That's a hard one because today's kids have their own mindsets. "You don't tell me what to do. I do it myself." But if I am capable of changing one mindset, it's a win for me. You know if that child can tell me he washes his hands every five minutes or after every meal, or come from the toilet, then that's a win for me. Or you can at least take home the message to younger brothers and sisters. Like changing mindsets of today's kids is a whole challenge on its own.
13	I think, um, like we must keep on doing this and do handwashings more often so that it gets to their mind. We talk to someone today, tomorrow they forgot. So if you keep on talking to them about it, it ends up becoming a behaviour. Even like, let's take you go to a new job like a new environment so you see this, so it becomes a behaviour to you as well or like, "I must stop this, they doing this and this." So also adapting to that way. So I think always doing the intervention, it's best to help their behaviour.
14	At schools (*thinking*), maybe if we took a different approach, we could show them more of a real-life situation. Like you know with UCT (*Kelly agreeing*), that's like real life, when you see things like that. That's going to help a lot in changing people's mindsets. And then also I think if we changed the dynamics where we show them how they benefit because a lot of them are just fine with "Oh, you should wash your hands for diseases and whatever, it reduces your chance of spreading diseases and so on." But if we show them something more to their understanding, how are they going to benefit? Like an actual benefit, immediate benefits. So how can we change our focus on education to the here and now that can reach a long-term goal? *(Kelly agreeing).* So I think that and also if we can include them instead of doing a presentation to them is maybe having them come with us to the community or something and have them train the community. Like you take a group of students to

	an old age home and let them show the people and so it sticks more with them and they [are] more part of it and they see the value
15	I think maybe legislation, for instance, if it means you must produce norms and standards, everybody's got them, they've got their own, so if you were to see what's in the norms and standards, that states clearly, for instance, that such things are a requirement because anything that looks like a requirement, it's not just me. You're not doing me a favour by me wanting to come here and it's not about causing trouble for you, but this is necessary for this (*Kelly agreeing*). I think that would be the best, 'cause sometimes it [is] almost as if you are begging or you want a favour or … Um, the mindsets do change a bit but, um, the influence is not only yours; it's also what is out there. So the best one can do is to invest in themselves as an EHP to, you know, learn new skills of teaching. We are not teachers before environmental health. Maybe yeah, try more effective ways to interact with children and, for instance, I know I'm one of those where children is not my best audience because I get irritated easily, so obviously whatever I'll have to say after being irritated, yes, I'm definitely going to send the message, but maybe [it won't be] so effective because I'm not going to be the (*claps hands*). I think children learn better if they see, they act out, they [become] involved (*laughs*). I know it's not my best audience. Maybe if we could [do] trainings on how to interact with certain age groups, what you could do, what could work 'cause most of the time you realise that you have to learn the stuff on your own. You have to come up with the stuff, you need to be creative [as] environmental health practitioners (*Kelly laughs*), you understand. Not all of us can be that gifted and it becomes frustrating – frustrating for you as a person who needs to do the project. Even frustrating for a line manager, like why aren't you doing enough or why aren't you keeping up with stuff? And it's just I can't come up with [ideas] because you're not that gifted. I know I'm not very gifted.

Appendix 21: Relevance of sanitation audits

EHP	Quote/s
1	No, "I am not familiar with the school audits; we mostly focus on the ECD audits, therefore I will not be able to comment or be able to answer your question effectively."
2	Yes, the learners numbers change every year, but the facilities are not increased accordingly. At some schools children have to queue and don't walways get to use the toilet in break time. It helps to point out maintenance issues and insure that frequent and adequate cleaning is taking place
3	Yes, The thing is … I think, um, what makes it difficult is how our authority, you know, according to schools, how can we go about … because now you say this school is overpopulated [with] children, what is going to happen with that? You know, I think the EHPs feel more according to schools, authority is not that big. So, they feel more, "Okay, there is nothing that can be done." What can a principal do, are you going to tell them, "Okay, the toilets must be fixed?" Is it his thing to do it? It's not even his property. So where does that information go to? So what is the point of going to do inspections and you find that things [aren't] in place? What will happen to that information afterwards? So I think that is more the concerns. So EHPs, I think, they feel they don't want to do much because there's nothing that's going to happen.
4	I think it's very relevant. I think it has a place, but it ends there, which is the problem. I go in, I evaluate, I make notes, this is what needs to change and I leave it with the principal and nothing changes. So it's one thing being audited, but when you don't have the infrastructure or the means to actually repair things and get things right, then why am I coming and doing the same thing and where's the enforcement? What's the next step? Because I'm also trying to build a relationship with the school here, [but they] want me to serve a notice now, but I must come in to do education – so it's conflicting, yeah, because [the] EHP must be everything. That's the problem. Define what you want us to do in school. Do you want us to audit? Then that's one role. Do you want us to educate?
5	Yes, that's what I use the audits tool for, to see which areas needed more attention. Yes, and then I based my project around that specific topic or that area of concern

	There's a lot of illnesses and sicknesses that get passed on through bad like inadequate sanitation and also it's just basic hygiene for us as humans. That is just to prevent diseases, the spread of diseases and illnesses and encouraging basic hygiene and responsibility as well, yeah, 'cause you need to make sure that the toilet is clean for the next person so it is your responsibility at the end of the day
6	Sure. It is because hygiene plays a very fundamental role, especially there's people we're talking about, the schools; they are vulnerable so it has to be implemented and be taught with the highest degree.
7	Um, we don't really do the sanitation audits. As far as I know. Because we need to get the sanitation audits when I came here, when I became a staff member. So I know Y went through a whole sanitation audit phase

Yeah, no, that's still in the pipeline. We don't do sanitation audits. I did it for one of my schools. It was also a private school because they needed the health clearance. Because where's the Western Cape Education Department in all of that, first of all, and also when the school was built, the amount of toilets to the amount of learners was obviously identified so why must we go out and do that again? And then also I know when I did X, there was a principal who reported to the education department continuously about a broken toilet and the Education Department just did nothing. So why are we doing other people's work? That's why I would say no. |
| 8 | It is relevant. When you go and do and talk about hygiene in general so when you go to this school when you look there it's totally different. Also, educate them, "Guys, it depends on you 'cause it starts with you." I always say that. So I think it is relevant for what we are doing. |
| 9 | I think it is relevant. However, I find that the schools have limited funds as well. You know if you come there and do the audits, you find out maybe the toilet has been broken and you ask them what did they do? They did do like a requisition and they send it in, but they still waiting. So the audit I find, yes, it's valid cause sometimes when you come there you find maybe a tap that's not working and when you come there, it will be done much quicker or they got a valid reason and you find out why. Or like on one of our schools there was an outbreak of diarrhoea and we found out [that] because of the water saving they opened one tap. We told them, "Listen, no, no, the water is too little for the amount of kids," and the tap was in the sun. So it is relevant for me. I believe yes, so when you go to schools they do it. If they have a |

	requisition for whatever was outstanding that's good enough. It's covered. The school is busy with … currently aware of it and they are busy with it.
10	Yeah, because you maybe get to check their toilets and the ratio then you give it to the teachers and then you hope that they use that information to improve their services. It is relevant to improve the conditions at their school.
11	No, because you know what? You go in there, you go to X primary, it is a semi model C school in Mitchell's Plain. X primary is so posh (*Afrikaans to English*), you can walk in and walk out. Now you go to Z primary, the parents don't have to pay, it's like that. (*Kelly interrupts:* So it's government?*)* Yes, so Z's (*Afrikaans to English*) people pay a bit. So you can be surprised … they don't get a lot of money. So now you go there … that's the other thing that's also a shortfall. Because we do the sanitation audits, you give it to the school and you tell them, "This is the amount of toilets that …", you forward it to the people because they say you must, so you forward it to the relevant people. The principal and EHPs help us to get these things, but we can't help you because what … we can maybe just forward it, write a letter. But the day after tomorrow, you maybe go again or over a month then only one or two toilets fixed. So it's like two steps forward three steps back. (*Afrikaans to English*) Children also may a whole lotta mess with the whole thing. You know, that's the other thing about schools. Because at schools (*Afrikaans to English*), I can tell you that they've got cleaners and janitors working. You can see they really go in at certain times and they clean the toilets. Even if the toilet seat is off. But then the lady says but you can see we did clean there, show us, but the toilet isn't fixed. Now comes Sonny and Sonny realises that I don't have a toilet at home so I'm going to break the toilet and throw things around. You know you take photos, next time you come you see that there's a difference – it's cleaned nicely. The toilet seats are maybe replaced so that's how it goes.
12	Not really. Because for me it's a whole lotta … it's too much information and then sanitation audits shouldn't be like the amount of toilets you have or whatever. You just need to audit to see if the sanitation is fully functional, it's clean, there's enough soap and water, dry materials for the children. I know at schools it's hard to leave soap in the toilets so maybe encouraging students to bring their own soap or hand sanitiser or something. But doing the sanitation audit takes long to get the information firstly from the school.
13	Yes, it's relevant.

	Because we [are] making sure that toilets and sanitation are good. Mind you, at the toilet, there is a lot of stuff happening like germs. So if the toilet is clean … so like the health, the kids of the school treat it like an adult, so toilets must always be clean like, yes, it must be in a good condition. So it's very relevant. It's very good to do the sanitation audits.
14	It is relevant, but I don't see the effectiveness of it. Because [when] we [are] doing the sanitation audit and you find, you know, bio types in the schools, but then you tell the school that it doesn't seem like the school takes it seriously because they still see us as "You're from the City; you're not government or WCED," so where WCED says your taps are broken, they make sure that by the end of the week those taps are fixed. But when City says [it] and we put it on that thing, then there's no implications for it. So it's relevant, but it's not effective. Like you know, if we see something wrong with the school, we [are] not ensuring a notice based on that audit.
15	I don't think anything happens after that. I think it's just irrelevant. Not that it's not relevant, it's good to keep record so that should anything happen, everyone knows that was the situation – you know, for record-keeping. The problem is the implementation. Are they really going to fix the toilet after we [have] left, after we [have] told them that it's broken? But it's good, should anything happen at the school, then the EHP has been there and did deliver a report to say this and this is fixed or this is the current situation. So they are relevant, but I mean now it's up to them, now what to do and we don't really enforce that much – we just suggest.

EHP	Quote/s
1	Finances; expected to do projects and job description (JD), and projects is time-consuming; Health Promotion portfolio is a huge portfolio – "just apart from your own job"; the target groups are from 8 to 12 years that was given, not effective as we don't get to the 6–7 years.
2	I feel that they don't budget enough. They want us to do the interventions, I mean there's a need for it, but they [are] not providing enough money for it. It feels like it's always a "beg, steal or borrow" type of thing. Material, yes. You know, the thing is, sometimes you almost need to compete with other private companies like Dettol or these companies and they also do similar interventions at the schools. But obviously they come there with, you know, gifts to the school and you come there with a little piece of paper and a poster and they'll say, "Oh, but Dettol was here," and this and that, you know.
3	Okay, so if I have to do it by myself it would obviously would be difficult 'cause, um, I didn't know there was a portfolio that you have to go about so that would be the limitations. Um, okay … now that I'm hearing all the questions, I would feel, yes. I feel like I'm in the dark now. Um, of getting me ready for [a] permanent position and doing these types of interventions, yes, I was put in the dark 'cause why didn't they tell me about a portfolio and this is how we go about [it] with schools, um, go read up on the norms and standards or the whatever by-law or regulation on schools and what must be done there. So, yes, I feel like I am in the dark. But there is still not really a … how must I put it? I think the colleagues they [are] complaining more about, "Um, we have to do schools now, um, inspections at the schools as well," but what if you find certain stuff that's not in place? Who are you gonna keep accountable for that? You know, is it the principal or is it the Western Cape Government? The whatever, you know. So I think most of us [are] still in the dark when it comes to the schools with the inspections, but with the interventions I think X is on the ball with that. But from my side, I didn't even know there was a portfolio. So, yes, I feel like I'm in the dark.
4	I think, um, strategy. It's very much a once-off kind of project. So you [are] going to a school and you talk and that's the end of the relationship and it's not just, it's time, it's energy, it's building a relationship. I don't feel that we as EHP, we have

	the capacity to build that and then you'd think that XY has that capacity, but you don't see it always or gain from it
5	Resources. Definitely resources and also just from the students themselves. You can only get a limited amount of students. There's not always a clear communication between the students and the staff as to what actually is the importance of this intervention.
6	Not really that I'm aware of, but when it comes to maybe resources, let's say pamphlets and all that we may run short of it. But, yeah, so far it's nothing that I'm aware of that we [are] short of.
7	Sjoe! I feel like there's a yes and there's a … yes, definitely. Definitely because it's time constraints is the first thing. I think first of all the time that's given with the children is a bit restrictive because you do go in when it's and sometimes the schools actually make you feel like you bother … you like …
	Yeah, yeah. It's like, "Okay, we'll give you 15 minutes with the kids so that you can do this and get off our back and it looks nice on our books," but then I think also the time constraint in terms of our workload and the EHPs workload because, yes you are expected to do these interventions however, you also have so many other targets that you need to reach. So then the other constraint is resources because really to print a page for R1 is ridiculous. So that's why I just scan the things and print what I need sometimes, I just print myself. Yeah, I think time and resources is definitely the two biggest ones.
8	Yeah, I can say when it comes to resources 'cause sometimes there's no resources. In terms of materials, like when you go to these schools to get their attention from the kids, you need something. Let's say like a goodie bag to get their attention, so next time when we come back, okay, they know … 'cause even when you tell the teachers, "Okay, it's fine, they gonna come," to get that, to make it more interesting or when we present, they can be like, "Okay, guys, you know what, for you guys to listen or whatever, we have something." Or to make them be more involved like and understand because when you throw some questions then you can get like a good feedback. And then by having goodie bags to be more interested.
	Time. 'Cause I remember the other day we, we had this towards the end of year-end, I think during exams, we were supposed to reach the target. So, I remember at one of the schools, I gave the principal what time we'll be there and we got there and he said, "No, since they are busy with exams so we must make it short as possible," and also the time … limited time and the space. Cause our target, it was Grade R and Grade 1 and 2, so now we had to split the group into threes since

	there was not enough space. We were hoping that we will be using a hall and then you know when you just [make] do … 'cause we were so used to
	a big group and then like if we're gonna split, we're gonna be two. Somehow you're like this is going to be too much so do more, but because of time you sort of limited yourself.
9	There is. I think the main thing is funding, health promotion materials, incentives to hand out to the kids. You can see sometimes … last year we gave out rulers and bags and it's like they were excited. What we do also, I must tell you, when we go to the school we give it to the teachers to give it to the children. We let the children line up as they sitting and we give it out. The teacher might hold it back or give certain children like my daughter at her school she said to me, "Mommy, only certain children got," and she knew one of my friends' colleagues as a friend was there and she said, "Mommy, this person was there and they gave this and my teacher didn't give … only gave certain people," so I learnt from that and when we go to schools, people need it. We will give out to each … even give extra 10 to 15 minutes, we will give each children. Um, funding, materials, if I go a little bit further now, Where to? Offices. The banners, the posters, the tablecloths. They will have the same day that we will have. There's no money for that. I'll say time. Maybe time you can add as well. We restricted to time
10	Like the equipment, the material because these days you just go there without the material. It is our main challenge. You find that in the diarrhoea season, maybe at that particular moment we don't have handwashing material, um, we don't have something that speaks about diarrhoea. So it is a challenge.
11	Constraints. You know to do quality things, I think, we don't have a lot of health promotion things to work with. We don't have. I mean our health promotion officer has so many soaps, but he can only, because he got it from the sub-council, 13 for example, and he can only use 13 out of 23, you understand? That kind of stuff. And you so easily go and talk and tell them this is how you should do it, whatever, whatever, but give them the soap and hold that. Even if we speaking about dental hygiene, what I normally do is I contact my friend, she's a dental assistant, "Do you have those small toothpastes?" Then I give them something because they remember it. "Like, okay, no fine, I need to brush my teeth," because with handwashing and all kinds of personal hygiene, you talk to them and think, yoh! She didn't brush her teeth or whatever, whatever. So that's the whole package in our communities is just to give them something small.

	Sometimes, some principals are very strict when it comes to us doing projects because obviously they also have their thing. So they would literally refer you to the departments to get whatever. I think it's more because they're scared of us. Not scared like what do they want to come do with us or whatever but like to get permission to get into the school. Where some schools, it's fine: "Come in, you can do your thing, whatever, whatever." But some schools are like no you need to get permission for this because we've got our school programme.
12	Resources. Like your general, like sometimes we don't even have information at the time and we must always wait. There's like a time period or something and the other constraints … I can't say the other departments [are] not interested, but it's always kind of if you plan properly, other departments can be more involved, but short notice, no. You have to inform them like way in advance.
13	Not really, no
14	I would think is our equipment, because EH doesn't have our own dedicated health promotion laptop and projector, so when primary health, health promotion is using it, then we don't have so that is one and then also sometimes the areas can be a bit dangerous. So it's difficult. And then I think one of the other constraints is … a lot of the time getting the school to work with us because the principals will make you run around and phone this one and phone that one, and a week before the time they cancel. So that is one of those constraints. And then also, um, what I would think is a big issue is the type of health promotion material we have, because it doesn't speak to primary school children, like we [are] giving them pamphlets, but they [are] not interested even though they [are] sending it to the parents also, but like something for the child as well. Like you know one of the other departments has that colouring book. So if we have a colouring book based on EH things, then maybe it would be a bit different.
15	Quality depends on us, foremost on what we have to offer. Um, I would say the budgeting 'cause mostly you are faced with your material, your pamphlets for children is what really you would like to do away with because you know they about resources, getting something they can take home that they can read or that they can see. It's not really much constraints, but I think the vital thing that would come into play would be that because it's not really motivated. I mean I only have pamphlets, am I really going to … I must jump around to try and illustrate. I think the budgeting would be the only and I mean at some schools they want appointments. I mean you go and ask for a particular date or when they would be

	available, so they will be talking about there's exams now. You can't disrupt classes until this time, you know. It can only be from this time, you know, and sometimes it doesn't make sense for us, the time that they require. I think the added constraints would come from the schools. The fact that they, they [are] not sure if it's about protection or what, but they can be difficult when you're trying to secure an appointment.