

Evaluating Implementation Status of the National Guidelines for Covid-19 Hygiene and Sanitation in Primary Schools of Marsabit County, Kenya

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ABSTRACT

Globally, erupting in late 2019 in China, COVID-19 pandemic became a monumental public health policy problem and threat to humanity of our time. As of June 13, 2021, the pandemic affected close to 176 million people and caused over 3.8 million deaths and disrupted global economies leading to loss of jobs and livelihoods. From a public health perspective, African countries like Kenya, need greater investments in water, sanitation and hygiene (WASH) interventions as the first line of defence to effectively mitigate against the pandemic. The objective of this study was to identify and assess the level and status of hygiene and sanitation implementation of COVID-19 national guidelines in four schools in three sub counties of Marsabit County in northern Kenya. COVID-19The study adopted a cross sectional design and mixed method in data collection. In addition, review of secondary literature both quantitative and qualitative data were collected during October to December 2022. Data was collected through administering questionnaires targeting 284 respondents, key informant interviews and focused group discussions with selected opinion leaders. Quantitative data was analysed using SPSS ver25 and univariate and bivariate statistical techniques were applied. Descriptive analysis using thematic technique was used to analyse qualitative data. The study findings observed that the current school based intervention for COVID-19 prevention included wearing of face masks (86%), practicing social distance (65%), hand washing with water (52%), and using alcohol based hand sanitizers (64%). It also revealed key factors influencing covid19 interventions: barriers to uptake included: lack of enforcement (84.2%), shortage of WASH facilities (78.9%), lack of funds (76.8%), lack of trained staff (70.4%), inadequate facilities (88.7%), lack of awareness (50.0%), poor attitude and ignorance (76.4%), accessibility (37.3%), cultural and religious factors (70.1%). This study concludes that while knowledge of transmission and prevention were found to be high; access to many of the essential support systems and WASH facilities remain a major challenge in the schools in Marsabit. These challenges were also identified from the findings of qualitative study. The study advances key recommendations notably: promotion of school-based training and sensitization of teachers and workers; increased financial support for provision of hygiene and sanitation facilities and preventive support supplies; expansion of community sensitization using radio, television, mass media and school drama clubs; and finally, enhanced financial and budgetary support from national and county governments, donors, and non-governmental organizations to implement robust WASH interventions especially in schools in the Arid and Semi-Arid regions of Kenya.

Key Words: Covid-19, Hygiene, Sanitation

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1.0 Introduction

1.1 Background to the Study

The years 2020 and 2021 experienced serious COVID-19 pandemic that affected the whole world. COVID-19: refers to a communicable respiratory disease caused by a new strain of corona virus that causes illness to humans. First discovered in Wuhan province of China, the disease spreads from person to person through infected air droplets that are projected during sneezing or coughing. According to Kenya national guideline for school definition 2020, it can also be transmitted when humans have contact with hands or surfaces that contain the virus and touch their eyes, nose or mouth with the contaminated hands. According to the Director-General of World Health Organization (WHO), Dr Tedros Ghebreyesus, in a press release observed that it is important that all schools have access to WASH facilities to ensure effective COVID-19 prevention and control, and that all governments must ensure these protocols are in order for safe reopening and operations of schools (WHO, August 13, 2020). Hence, in every country, the fight against COVID-19 through improvement of Water, Sanitation and Hygiene (WASH) and compliance with national guidelines for schools is very important.

During this pandemic of COVID-19, United Nations Children's Fund (UNICEF), WHO and other international and national agencies called upon governments to implement Water, Sanitation and Hygiene and infection prevention and control measures in schools as they begin to reopen as this will help stop the spread of COVID-19 and keep children safe while also protecting children from other sanitation and hygiene related diseases, which will lead to safe and effective learning environment. However, according to United Nations High Commissioner for Refugees (UNCHR), an estimated three billion people globally lack soap and water at home for good hand hygiene, with only 56% of primary schools and 58% of secondary schools had basic hygiene services (UNHCR 2020). It is noted that at least 0.7 percentage increment of global sanitation services coverage from the year 2015 to 2020 in schools though no such significant improvement in Arid and Semi-Arid Lands (ASALs) like Marsabit County. In addition, according to WHO/UNICEF's Joint Monitoring Programme (JMP) Report, the high percentage around three quarters who lack these essential services live in the world poorest countries and amongst most vulnerable groups like children, people living in refugee camp, informal settlement, areas with insecurity issues, migrant and the poor, putting estimated one billion of them at immediate risk of COVID-19 due to lack of basic hand washing facilities (WHO/UNICEF, JPM, 2020).

Access to drinking water, sanitation and hygiene services are the right of every child while at school leading to quality education, good health and dignity especially for girl-child considering the long duration of time children spends at school. Under UN Sustainable Development Goals (SDG), WASH inclusion in school setup reflects its importance in reducing illness, poverty and mortality rates in every nation hence improve socioeconomic status of the people in every nation leading to safe, inclusive, effective and efficient learning environment. WHO/UNICEF JMP (2020) Report, revealed on progress of drinking water, sanitation, and hygiene under the SDGs in schools for the years 2000–2019 with a special focus on the implications for ensuring student's and school staff's safety during the corona virus disease (COVID-19) pandemic. The report found out that a total of 818 million children lacked basic hand washing service at their school out of which 355 million whose schools had facilities with water but lack soap, while 462 million whose schools lack hand washing facilities and no water available for hand washing too. Three out of four children lacked a basic hand washing services at school at the start of the COVID-19 in 60 countries at the highest risk of health and humanitarian crisis like sub-Saharan Africa, and

moreover one in three schools worldwide had either limited drinking water services or no drinking water at all in addition to 698 million children who lacked sanitation services at their school. UNICEF and WHO are committed to achieving equitable access to adequate WASH services worldwide. The agencies recently launched a joint initiative dubbed Hand Hygiene for all, to support the most vulnerable communities with the means to protect their health as we all know that health is wealth. Multi sectors approach is facilitated to ensure affordable products and services are available, especially in disadvantaged areas and to enable a culture of hygiene.

Research has shown that while a huge percentage of schools had a basic sanitation service, thousands of children in ASALs lack a basic sanitation service at their school as we all know the availability of functional school toilets and basic hygiene services like hand-washing facility with water and soap can positively impact health and learning outcomes, especially for girls particularly for Menstrual Hygiene Management (MHM). Academic research suggests that access to adequate WASH services in schools may contribute to improved education and health of children by reducing the number of days missed in schools due to menstrual periods or providing more time for learning tasks (Freeman et al. 2012; Jasper et al. 2012). In Sub-Saharan Africa, scholars argue that the recent years the issue of water and sanitation continues to be a critical challenge year in year out (Wanczeck *et al*, 2017). In the sub-Saharan Africa in contrast with the developed nations, access to clean water remains a challenge for the people (Rodriguez 2019). According to the 2008 UN Millennium Development Goals Report, the ASAL countries were the most disadvantaged with very low growth in the sanitation infrastructure, which only saw an increase in access from 27% in 1990 to only 31% in 2008 (UN, 2008). This is an indication of slow progress especially for sub-Saharan Africa as reflected in this report that only 16% have access to improved sanitation in comparison to 80% in wealthier nations – with increasing disparity gap projected (UN, 2008).

According to study by Development of Resilience Empowering Alternative Measure (DREAM) ASAL 2019 conference in Ethiopia (Sept 29- Oct 3, 2019), ASALs pose different challenges to the WASH sector (Sanitation Hub, 2019). The Ethiopian National Open Defecation Free Campaign 2020-2024 presents the opportunity for WASH interventions to further develop and scale up in Ethiopia lowlands, and mainly in the country's largely nomadic Regional State of the Afar, as the region has the largest gap to fill in achieving national sanitation and hygiene targets (Sanitation Hub, 2019). Impacts of inadequate water and sanitation are particularly pronounced for women and girls because inadequate sanitation facilities may expose women to the risk of violence and finding adequate locations for open defecation can require significant time and energy resources. Women and girls also bear most of the time and energy burden associated with fetching drinking water and may potentially increase the risk of violence and injury (Sanitation Hub, 2019).

Kenya is considered chronically water scarce. The ASALs in Kenya are highly affected, with water scarcity leaving most of the inhabitants' dependent on unimproved water sources. Water sources for most households in ASALs is drawn from water pans, dams, unprotected springs, unprotected wells, water vendors and rivers. Recently various Non-Governmental Organizations (NGOs) have tried to implement the construction of pit latrines in public institutions, households and creating public awareness about the significance of good hygiene but these interventions have yet to have any significant effect on the rate of diseases. A report of UNICEF (2020) indicates that more Kenyans have access to safe drinking water at (59 per cent) than to basic sanitation (29 per cent). An increase of 12 percent access to safe drinking water was noted since the year 2020 though access to basic sanitation has fallen by 5% which reflect higher population practicing open defecation especially in rural areas, while the number of Kenyan population with hand-washing

facilities with soap and water at home remain low at only 25% (UNICEF 2020). According to the 2014 JMP report, Kenya was ranked to be among countries with inadequate sanitation facilities in the rural areas, where some open defecation practices have been reported.

According to Wasonga et al (2014), hygiene practices at home have been noted to provide a clean environment for children, thus reducing the threats to their health and provide the best chance of a prosperous living. According to a study by Kurui et al (2019), “despite numerous efforts and interventions by the private and government sectors, 1.3 billion people in the developing world lack adequate access to clean and safe drinking water. Recent statistics indicate that approximately 770 million people still use unimproved water sources, whereas 36 per cent of the world’s population lack improved sanitation facilities.” (Kurui et al, 2019).

Marsabit County in northern Kenya is one of the most water deficient counties in the country. The county has had numerous occurrences from the Ministry of health ailments reports especially of cholera and typhoid. Unimproved sanitation and open defecation have been linked to low height for age scores (stunted growth) in children in the county and the problem has been associated with other problems like poor cognitive that results to poor performance in school. Ministry of Health (MOH) report revealed that 33.1% of children in Marsabit are stunted (Sanitation County Benchmarking, MOH, 2013). According to post short rains 2021 Drought Needs Assessment in ASALs including Marsabit; the county assessment report indicated that only 32% of community access latrine and 32% with usable latrine while 71% of this community practice open defecation. In additional, only 21% of the community can access soap (ASAL Humanitarian Network, 2021). The County being water deficient and arid, and already facing challenges of WASH implementation, is one among counties that might face extreme difficulties in implementing national guidelines to combat COVID-19 in schools. The aim of this research is to identify the level of hygiene and sanitation implementation of existing guidelines in relation to COVID-19 prevention in selected primary schools in Marsabit sub-counties.

1.2 Statement of the Problem

At the start of this review, as of May 15, 2021, Kenya’s COVID-19 tally stands at infections of 165,379 persons, 113,489 recoveries, and 3,001 deaths. Although the actual data by county is not precise, all counties have been affected. Due to distance from Nairobi and other cultural factors and poor health outreach, Marsabit continues to be at major risk. Evidence of the implementation of school-based WASH programs in rural nomadic schools especially at the time of COVID-19 pandemic is limited. Hence, this study attempts to bridge this knowledge gap by examining experiences of schools in rural counties such as Marsabit in northern Kenya combating/mitigating the impacts of the pandemic through the implementation of Kenya’s national guidelines on COVID-19 in schools.

In Kenya, the ASAL region which constitutes close to 75% the country’s landmass has limited access to WASH. Often inhabited by nomadic communities, in the ASALs, the levels of sanitation among nomadic communities in the last decade remain low in contrast to other regions. According to the 2014 JMP report, Kenya was ranked to be among countries with inadequate sanitation facilities in the rural areas, where some open defecation cases have been reported (WHO/UNICEF, JMP, 2020). Marsabit County in northern Kenya is one of the most water deficient counties in the country. The county has had numerous occurrences from the Ministry of health ailments reports especially of cholera and typhoid which is an indication of poor hygiene practice. According to Kenya’s MOH’s Sanitation County Benchmarking study in 2013, Marsabit is ranked number 15

out of 47 in the country with 33.1% of children stunted (Sanitation County Benchmarking, Ministry of Health, 2013). According to post short rains 2021 Drought Needs Assessment in ASAL where Marsabit is one of it; the county assessment report indicated that only 32% of community access latrine and 32% with usable latrine while 71% of this community practice open defecation. In additional, only 21% of the community can access soap (ASAL Humanitarian Network, 2021).

Evidence of the impact of school-based WASH programs in rural nomadic schools especially at the time of COVID-19 pandemic is limited. The aim of this research was to identify the level of hygiene and sanitation implementation of existing national guideline in relation to COVID-19 prevention in selected primary schools in Marsabit sub-counties. Marsabit County being water deficient and arid, and already facing challenges of WASH implementation, was one of the counties that might face extreme difficulties in implementing national guidelines to combat COVID-19 in schools. Therefore, this research assessed schools' compliance with national COVID-19 guidelines by identifying the level of awareness among schools' staffs and pupils. Additionally, the research examined the level of support that these schools received from national and county governments. Through such an investigation, this study seeks to bridge the existing knowledge gap by examining the experiences of schools in rural counties such as Marsabit in northern Kenya to combat the impacts of the pandemic through the implementation of Kenya's national guidelines on COVID-19 in select schools.

1.3 Study Objectives

The general objective was to identify level of hygiene and sanitation implementation of COVID-19 national guidelines and factors that influence in primary schools in Marsabit County.

The specific objectives of the study were:

- i. Assess the implementation status of hygiene and sanitation measures in response to the national guidelines for the prevention of COVID-19 among selected primary schools in Marsabit County.
- ii. Identify schools-based factors that influence hygiene and sanitation implementation of COVID-19 prevention in Marsabit County.
- iii. Identify community-based factors that influence hygiene and sanitation implementation of COVID-19 prevention in Marsabit County.
- iv. Explore county level support for COVID-19 prevention measures in primary schools in Marsabit county.

2.0 Literature Review

2.1 Theoretical Framework

This study is underpinned by a number of interrelated theoretical frameworks: behavioural change theory, sanitation theory and theory of planned behaviour. Behavioural change theory is the commonly applied theory in the case of Sanitation and Hygiene as it focuses on disease preventive approach and lifestyle behaviours that impact on health. It emphasizes the importance of cleanliness and absence of germs and provision of facilities like hand washing services to achieve such absence of diseases causing organism. According to Wall, Genthe, Steyn and Nortje (2012), sanitation theory states that microorganisms are responsible for infectious diseases. Therefore, sanitation theory stresses the importance of cleanliness and absence of germs and provisions of facilities and services to realize such absence (Wasike, 2010).

Sanitation theory, hence, seeks individuals to adopt healthy lifestyle, to use preventive health services and to take responsibility for their own health. Of importance is Health Belief Model that emphasized on: Belief in personal susceptibility to diseases, belief that the disease is serious, belief that recommended measures will be effective in reducing the threat and finally belief that recommended measures will not entail heavy cost. Importantly, another relevant theoretical framework for this study is the theory of planned behaviour which Ajzen (1985) advanced (see figure 1 below). This theory, a psychological theory connects beliefs to human behaviour. The theory argues that three main core components: attitude, subjective norms and perceived behavioural control, in a combined manner, shape and determine a person's behavioural intentions. Hence, the behavioural intentions, is the most proximal determinant of human social behaviour.

2.2 Review of Related and Empirical Literature

Globally, the eruption of the SARS-CoV-2 infections popularly known as COVID-19 virus in late 2019, termed as the corona virus disease of 2019 (COVID-19), first erupted in Wuhan city of the Hubei province of China in December 2019. Spreading like bushfire across the globe, WHO declared COVID-19 as global pandemic (Wu et al 2020; Zhou et al, 2020; WHO 2020). One year after the first detection, according to studies by John Hopkins University Corona Virus Resource Centre, by around November 2020, globally there were more than 51 million infections and over a million deaths (John Hopkins University Corona Virus Resource Centre 2020). According to scientists, the virus causing the COVID-19 pandemic is categorized as Severe Acute Respiratory Syndrome Corona virus-2 abbreviated as SARS-CoV-2 (Gorbalenya et al 2020; Li et al, 2020). As observed by (Fehr, 2015), the SARS-CoV-2 belongs to the genus Beta corona virus in the sub-family Orthocorona virinae of the family Corona viridae together with other three genera which include AlphaCorona virus, GammaCorona virus, and DeltaCorona virus. Within the family Corona viridae, in which SARS-CoV-2 clusters, there are other six viruses i.e., SARS-CoV-1 and MERS-CoV, which are known to cause severe human illnesses and 229E, OC43, NL63 and HKU1 strains, which cause mild symptoms. As Li (2020) observed, structurally the COVID-19 virus is comprised of enveloped viral particles with positive sense RNA strands ranging from 60 nm to 140 nm in diameter with spike-like projections on the surface, giving the virus a crown-shaped appearance.

As of June 13, 2021, globally, according to worldometer's counter reveals the following statistics: infections 176,482,998; and deaths: 3,812,194 (worldometer 2021). In Africa, according to Africa Centre for Disease Control (CDC), as at June 12, 2021, the statistics reveal the following: infections of 5,011,502 people; and deaths: 134,239 (Africa CDC, June 2021).

As the above statistics reveal, the pandemic has brought to the centre stage, the importance of WASH as a key prevention measure in combating the spread of the pandemic to save human lives. WHO, UN and other public health institutions and national governments advanced strong advocacy campaigns and resource mobilization for the improvements and provisions of WASH facilities guidelines to fight the pandemic. Rich western countries including the United States have been ravaged by the pandemic resulting in millions of deaths. Globally, although registering lower infections and deaths, poorer continents such as Africa are believed to be at great risks.

Even in the pre-covid times due to developmental and other social-economic factors, the penetration of WASH infrastructure in low-income regions such as the African continent has been low. With the pandemic, as Donde et al (2020) argue, in particularly low-income countries WASH as an important control measure strategies remain a major problem. Indisputably, promotion of

WASH in schools greatly reduces incidences of diseases among students – and positively impact not only on child health but education and survival as well. Importantly, key scholars and scientists have argued that during pandemics access to WASH is critical for enhanced human health and as well save human lives (Prüss-Ustün et al., 2014; Sophie et al., 2016; Chen et al., 2020). Particularly scientists argue that within the larger WASH compliance, hand hygiene is critical COVID-19 prevention and mitigation measure to curtail transmissions (Guy et al., 2020; WHO/UNICEF, 2020). It was advanced that adherence to simple practices such as washing hands with clean running water and soap could break the chain of the viruses and bacteria responsible for diseases.

Globally, low-income nations host the largest proportions of persons lacking access to WASH infrastructure. These populations either reside in rural communities or informal settlements and slums. Moreover, studies have observed that there was greater global fears and anxiety of the devastating impact of COVID-19 on low-income nations with weak WASH infrastructure and poor health infrastructure for effective response and mitigation (Blake et al 2020, Hopman et al 2020).

There are global initiatives for promoting COVID-19 vaccines and mass vaccinations. However, scholars have argued that implementation of the WHO measures are imperatives building on exposed populations health and immunity situations for effective mitigation of the spread of the pandemic (Mohamed and Josef, 2020; WHO, 2020). The WHO COVID-19 guidelines including good hygiene notably hand washing with clean running water and soap, social distancing of 1.5 meters, wearing of face masks in public places including public transport, and the frontline medical workers and use of Public Protective Equipment (PPEs) to mitigate the spread of the COVID-19 pandemic have been adopted globally (WHO, 2020). Various studies have noted that the COVID-19 virus' survival duration depends on a number of factors such as surface type, temperature, relative humidity and the type of the virus' strain and can persist in aerosols and other similar surface (Doremalen et al 2020). It has also been found to be less stable in the environment and detergent and oxidants such as chlorine can significantly eliminate the virus (Salido et al., 2020 and WHO/UNICEF, 2020). The use of face masks has been identified for playing critical roles of preventing transmission of the virus to others and as well protecting the wearer (Howard et al., 2020)

Previous experience and scientific knowledge base has shown that a good hand hygiene adherence has been known to break the cycle of transmission of a host of other viruses and bacteria which propagate illness such as: common colds, flu, and pneumonia such as rhinoviruses, Corona virus, influenza virus, respiratory syncytial virus, adenovirus, enterovirus, Chlamydia pneumoniae, Haemophilus influenzae, Streptococcus pneumoniae, Mycoplasma pneumonia (Mäkelä et al, 1998., Pruss-Ustun et al., 2014; Chen et al., 2020; Hopman et al., 2020; Zunyou and Jennifer, 2020). As a response to covid pandemic, a number of countries across the world comprehensive assessment of WASH facilities in schools as containment strategies. The various governmental and UN supported surveys sought for information of access to water, toilets and hand washing facilities, availability of water and soap among others, and also user ratios to available facilities. So various mapping exercises were aimed at ensuring safe and healthy environment to permit reopening of schools. Hence, the centrality of good hand hygiene was welcome news to the global public authorities since it is relatively inexpensive. According to Cairncross and Valdamanis (2006), hand washing with soap which costs about US\$3.5 per disability-adjusted life year (DALY) averted, is a cheap public health intervention across many nations and households.

Consequently, whereas hand washing is inexpensive method to combat COVID-19 pandemic, the sad global reality, however, is that access to WASH across the globe remains a major challenge for low-income nations especially the rural communities and informal settlements inhabitants (Owassa et al., 2020, Adams et al, 2009). Additionally, COVID-19 guidelines such as social distancing, self-isolation and avoidance of public places continue to be a monumental challenge for people in several households in rural communities and densely populated slums in low-income countries. This is due lack of adherence to social distance when several members of the same household share tiny bedrooms, share communal water points or pipes, share the same latrine with neighbours or get cramped into the same public service vehicles. Most of these facilities still remain in poor conditions (Guy et al., 2020).

Beyond the struggles to expand poor communities and household's access to WASH facilities, provisions and sustained implementation of such basic and inexpensive regular hand washing facilities with a soap continue to be a challenge in Africa, Asia and South America (Donde et al, 2020). It is estimated from a budgetary costs perspective, that universal access to WASH services in order to realize UN SDG 6 targets by 2030 would require about 0.13 to 1% of the gross regional product (GRP) of low income and middle-income nations in Sub-Saharan Africa and Southern Asia (Hutton and Varughese 2016). This has been found to be a tall order because these nations are already under various economic burdens with their little fiscal resources further stressed with COVID-19 mitigation budgets. It is imperative that these poor nations be assisted by the international community to roll-out reasonable WASH facilities to effectively implement WHO-advised COVID-19 guideline in communities, schools, hospitals and other public facilities to stem the spread of the pandemic.

Other studies have found, surrogate human Corona virus to exist for a number of days in tap and sewage at 4 °C - 25 °C. However, there is no evidence of the COVID-19 virus' transmission through drinking water, waste water or faecal-oral methods, but these findings points to the need for investments in sufficient WASH infrastructure and sewerage services and there is need for greater monitoring of waste water effluents in communities and municipal settings (Ahmed et al, 2020, Mallapaty, et al, 2020). Compliance with standards for waste disposal and management of hospitals' waste management systems has become a major challenge and WHO/UNICEF (2020) have also demanded and provided key advisories for strict sanitation procedures with regards to dealing with wastes (biohazard) from hospitals and from COVID-19 patients. Accordingly, in low-income nations or settings, management of wastes from hospitals and health centres has become a key challenge that may even trigger virus transmission. Some authors have advised that as a precaution separate flush toilets or latrines should be provided and cleaned and disinfected twice daily by trained cleaners equipped with appropriate PPEs (Nzediegw and Chang (2020), Rhee (2020). A study in Kenya called for addressing the barriers to ensuring proper sanitation and also called for greater hygiene and cleanliness of toilets in crowded settings informal settlement settings (Simiyu et al 2020). Hence, a number of countries have come up with waste management guideline and policies, while others are coming up with isolation and treatment centres, and have paid little attention to the safe disposal mechanism of the health wastes (Sarkodie and Owusu, 2020, Ugom 2020).

Studies have observed that the COVID-19 pandemic underscores the critical importance of WASH for preventing infectious diseases and reinforces previous pronouncements that adequate hygiene and sanitation is crucial for public health. However, key WASH recommendations put forward by WHO to effectively contain the pandemic have been difficult to undertake in low-income

countries. As a policy guideline, studies recommend the transformation of WASH policy and action plans and scaling up through appropriate political involvement to address current needs while preparing for future public health emergencies. This would require high-level political attention and closer coordination between public health and WASH sectors at the level of implementation.

Further, they observed that WASH is central to the COVID-19 response and recovery strategy. Sufficient funding is necessary to provide and maintain adequate WASH services and support countrywide advocacy programmes on science-based messaging. This will ensure that WHO recommendations on regular hand washing with clean water and soap are achieved universally (Donde et al, 2020). Overall, global state of sanitation as the world battles COVID-19 pandemic is quite wanting. In August 2020, the WHO/UNICEF JMP released a progress update on *Water Supply, Sanitation and Hygiene* detailing estimated trends from 2015 to 2019 and a special focus on the implications for ensuring the safety of students and school staff during the COVID-19 pandemic (WHO/UNICEF JMP report 2020).

Blanton et al (2010) is one of the influential studies on WASH in schools in low-income countries. The study focused on Kenya's installation of hand-washing stations in school, training of teachers on WASH promotion, pupil's education on hygiene, and instructional comic books distribution to students, encouragement of pupils on hand washing in schools and homes as well as promotion of water treatment (Blanton et al 2010). Similarly, a study by Mwachiro on the challenges facing uptake of hand washing with soap programme in schools in Tana Delta sub county, Kenya November 2014 revealed that, there is a gap in hand washing with soap in schools in spite of its importance (Mwachiro 2014). Studies reveal that implementation of WASH in schools have significant beneficial impacts on child health especially reduction of diarrhoea disease and other hygiene-related diseases among learners. Several studies found correlations between reduced incidences of hygiene-related diseases such as diarrhoea and respiratory illnesses and WASH interventions in schools. Hence, such reductions have beneficial health impacts on school children and improved learning capacity.

The health benefits of improved WASH infrastructure and resources in schools may depend on consistent availability of soap and water for hand washing and on conditions of the latrines, not only pupil to latrine ratios. For example, Saboori investigating utilization of soap after latrine use among pupils in 60 Kenyan schools in Nyanza province report that "a system of regular soap provision to schools was associated with a significant increase in hand washing rates in approximately one-third of the school population, but barriers to hand washing in school remain." (Saboori, 2013). The study found that in situations where there is a regular supply of soaps the number of pupils who observed hand washing hygiene significantly increased (Saboori et al, 2013). Additionally, in randomized studies conducted among 42 rural schools in Kenya, reported that installations of simple hand-washing and drinking water stations not only increase students' level of hygiene knowledge and hand-washing techniques but also reduced incidences of respiratory illness among the students (Patel et al 2012).

Several studies also emphasize that combined interventions that include multiple components—for example, latrine construction, hygiene promotion, latrine maintenance, and sustained provision of resources such as soap and water for hand washing—are more effective at reducing WASH-related diseases than single interventions such as construction of latrines. Studies have also shown that there is a direct relationship between improved sanitation at schools and communities where these students come from. Scholars have argued that globally WASH in school is recognized a key

intervention to enhance children’s rights to a clean environmental setting, health, and thereby “influence a generational change in health promotion behaviour and attitudes” (Mooijman et al 2010). Importantly, the school environment is an ecosystem through which pupils, teachers, administrators, suppliers, parents and workers from the community interact. Therefore, WASH provisions in schools should be looked from a community lens rather than isolated school perspective. For instance, students and teachers engaging with the community can act as agents of change towards appropriate hygiene behaviours in the wider context.

2.3 Conceptual Framework

This study relied on the conceptual framework below, in trying to understand and evaluate the implementation of national COVID-19 guidelines in Kenyan schools. The conceptual framework presents key determinants such as: access to hygiene and sanitation facilities, level of knowledge and awareness among the teachers and pupils, socio-economic status of the local community and nature of the local environment. It is conceptualized that successful implementation of COVID-19 guidelines in schools in nomadic communities in the ASAL region is dependent upon the aforementioned factors.

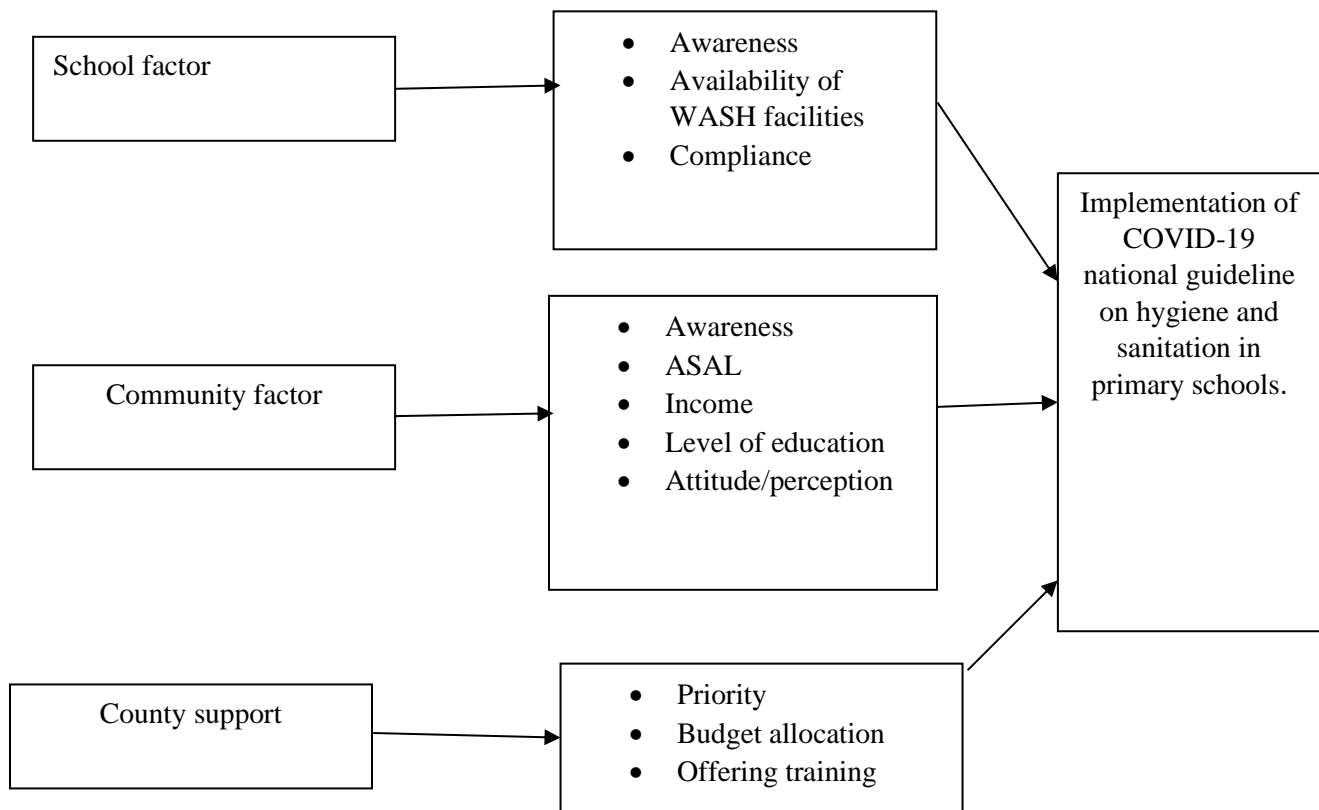


Figure 1 : Conceptual Framework

3.0 Methodology

This study utilized a cross-sectional study research design. Both qualitative and quantitative data was collected. Multiple data analysis methods were utilized. This study was conducted in Marsabit County, Kenya. Marsabit is located in Eastern province and it borders Ethiopia, it falls under arid and semi-arid region of Kenya and largely occupied by pastoralist communities. The main study

area was Marsabit county specifically North Horr, Saku and Laisamis sub-counties. The study selected four schools in three sub-counties of Marsabit county to examine the implementation of hygiene and sanitation services according to national guideline in primary schools and document their experiences. The study population include: head teacher, teachers, pupils from class 5 to class 8, school support staffs (cleaner, cook and watch man) and key opinion leaders in the proposed study area. The study included both gender.

The study included only pupils in class 5 to class 8, respective head teachers, teachers and school support staffs and key opinion leaders in the proposed study area. Pupils of different genders, religion and ages were included. Additionally, in the Focus Group Discussions staff of different employment grades and persons of different religion, ages, and job categories were included. The study excluded pupils below Grade 5, away around the time of the interview, deaf, sick and pupils who recently transferred to the school where study was conducted. The study utilized Cochran formula for pupils, a sample size of 323 respondents were distributed among schools and focus group discussion (FGD) for teachers and schools support staffs since they are few, and conduct key informant. Specifically, the sample sizes were distributed according to sub-counties as follows: North-Horr (Maikona (100) and Bubisa (120), Saku (100) and Laisamis (100) targeting four schools' population in classes 5-8. The sample size for Marsabit North was higher because the sub-county is expansive, and two schools were added to the sample pool. Special attention and provisions were made for gender and ensure both female and male pupils as well as the teachers were considered. In all sessions, attempts were made that not more than 60% of one gender were selected to participate in the interviews or FGDs.

The sample size was distributed to the four schools based on proportionate sizes of the schools resulting in Bubisa (n=93), SKM (n=77), Maikona (n=77) and Loglogo (n=77). Both qualitative and quantitative data was collected. In terms of primary data, it was gathered by observational methods, administration of a questionnaire and interviews. Secondary data was gathered from various documents that is government's health reports and surveys, school dispensary records, NGOs reports and other academic sources among others. In the collection of primary data and conduct of FGDs, four field research assistants (two males and two females) with knowledge of research and community health were recruited. A pre-data collection and tools testing in-person workshop was held in Marsabit county for two days and virtual sessions were held on weekly basis during the field work. As the lead researcher, I personally led the training sessions and oversaw and coordinated the field work.

Before the field work, the researcher applied and secured a research permit from the National Council of Science and Technology after approval by the University. Permission to collect data in primary schools were obtained from the Ministry of Education officials in Marsabit County. Additionally, the researcher wrote introductory letters to the head teachers and meetings were held with officials of the respective schools' Parents-Teachers Association. The questionnaires were administered to pupils and key parents in the mornings and weekends, and collected and properly filed. In terms of analysis, both qualitative and quantitative methods were used to analyse data. For quantitative data bivariate statistical techniques were used for assessment of relationships between gender, socio-demographics factors and variation between schools. Chi-square tests were determined for testing variation of different variables by school. The SPSS version 25 was used to analyze quantitative data. Transcription process was conducted before data analysis whereby thematic type of analysis was conducted on qualitative data. Data was summarized and presented

as table for the quantitative data emerging themes and patterns to present quantitative data and emerging trends.

4.0 Study Results

4.1 Knowledge of COVID-19, Transmission, Prevention and Knowledge of National Guidelines for Schools

This study was set to investigate the level of knowledge of COVID-19, modes of transmission and prevention, and the knowledge of national guidelines for schools. The study found out that knowledge of COVID-19 was high among the respondents (100.0%) and knowledge of national guidelines for schools was low (35%).

Table 1: Knowledge, transmission and prevention of COVID-19, and awareness of national guidelines

	Knowledge of COVID-19	Gender		Total (N=284)
		Male (N=155)	Female (N=129)	
Knowledge of COVID-19	Heard of COVID-19	155 (100)	129 (100)	284 (100)
source of covid knowledge	Health workers	127 (81.9)	106 (81.9)	233 (82.3)
	Relatives/peers	55 (35.5)	41 (32.0)	96 (33.9)
	Seminars/workshop	43 (27.7)	29 (22.7)	72 (25.4)
	Mass media	125 (80.6)	102 (79.7)	227 (80.2)
	Teachers	128 (82.6)	108(84.4)	236 (83.4)
	others sources1	6 (3.9)	3 (2.3)	9 (3.2)
COVID-19 transmission	Coughing	61 (39.4)	45 (35.2)	106 (37.5)
	Sneezing	48 (31.0)	28 (21.9)	76 (26.9)
	Body contacts	126 (81.3)	106 (82.8)	232 (82.0)
	Air/breathings	30 (19.4)	19 (14.8)	49 (17.3)
covid prevention	Washing hands	44 (28.4)	37 (28.9)	81 (28.6)
	Vaccination	8 (5.2)	6 (4.7)	14 (4.9)
	using face masks	131(84.5)	100(78.1)	231(81.6)
	social distance	92(71.3)	81 (73.6)	173 (72.4)
	hand sanitizers	63(40.6)	48 (37.5)	111 (39.2)
COVID-19 guidelines	Heard of guidelines	53(34.2)	47 (36.7)	100 (35.3)
	Guides-Washing hands	35 (22.6)	34 (26.6)	69 (24.4)
	Guide vaccination	23 (17.8)	19 (17.3)	42 (17.6)
	Guide face masks	61 (39.4)	54 (42.2)	115 (40.6)
	Guides social distance	53 (34.2)	47 (36.7)	100 (35.3)

	Knowledge of COVID-19	Gender		Total (N=284)
		Male (N=155)	Female (N=129)	
	Guide_sanitizers	59 (38.1)	50 (39.1)	109 (38.5)
	Guides no crowding	5 (3.2)	1(0.8)	6(2.1)

As shown in Table 1 above, nearly all respondents had heard of COVID-19. The main sources of information on COVID-19 for both male and female respondents were teachers (83%), health workers (82%) and mass media (80%). The most commonly cited ways of transmission of COVID-19 were through body contacts (contaminated hands) with affected person (82.0%), coughing (37.5%) and sneezing (26.7%). The commonly cited ways of prevention were wearing face masks (81.6%), keeping social distance (72.4%), using hand sanitizers (39.2%) and washing hands with water and soap (28.6%), Vaccination is the least cited way of prevention meaning the acceptance level of vaccination is very low. The four commonly cited components of COVID-19 guidelines were use of face masks (40.6%), hand sanitizers (38.5%), keeping social distance (35.3%) and hand washing (24.4%).

4.2 Knowledge of WASH, and Assessment of Availability of WASH Facilities

The study investigated about knowledge of WASH and assessment of the availability of WASH facilities in schools. The study demonstrates that knowledge of WASH to be high among respondents (98%) and WASH facilities were reported available in schools (93%). The table below summarizes the findings. There was no significant difference in knowledge of WASH, sources of information on WASH and availability of WASH facilities in school by gender. Those who have ever heard of WASH were 235 (98.3%). The respondents' sources of WASH information were: at school 213 (89.1%), at home 65 (27.2%) and at health facility 61(25.5%). The most commonly cited sources of WASH information were teachers 224 (93.3%), health workers 213 (89.1%), mass media 185 (77.2%), relatives/peers 95(39.7%) and seminars/workshops 65 (27.2%). Over half of respondents indicated WASH as important 132 (55.2%) and very important 103 (43.1%). Overall, 93.3% of respondents indicated schools had WASH facilities in school and the commonly facilities available were: water tanks (60.7%), pit latrines (59.2%), WASH drums (55.2%), and hand sanitizers (21.8%).

4.3 Knowledge of WASH, Information Sources and WASH Facilities by School

The study aimed at assessing the knowledge of hygiene and sanitation information and facilities in schools. The study found that the knowledge of WASH was very high and similar in the four schools (98.6). Knowledge of WASH, information sources and WASH facilities by school, summarizes the data. Overall, the knowledge of WASH was similar in the four schools. Those who heard of WASH at school were over 80% in the four schools. Teachers were cited as main sources of WASH information by over 85% of respondents in the four schools followed by health workers significantly higher at SKM (100.0%) and Loglogo (100.0%) than at Bubisa (80.2%) and Maikona (75.0%), (chisq=34.8, p=0.000). The mass media the third most used source of information by about 78% of the respondents but was significantly higher in Loglogo (94.3%) and SKM (92.3%) than at Bubisa (81.5%) and Maikona (44.4%), (chisq=65.0, p=0.000). Other notable sources cited were: relatives and peers which was higher at SKM (53.8%) and Loglogo (50.0%) than at Maikona 23.5%) and Bubisa (21.0%), (chisq=27.3, p=0.000) and workshop/seminars cited significantly at Loglogo (60.0%) and Bubisa (30.9%), (chisq=69.9, p=0.000).

Overall, over 94% of respondents in the four schools indicated they had WASH facilities in their schools. The most common WASH facilities in the four schools were: wash drums (59.9%), significantly higher in Bubisa (84.0%) and Maikona (66.2%) than in SKM(44.6%) and Loglogo (40.0%), (chisq=38.5, p=0.000); followed by water tanks (58.1%), which was significantly higher at Maikona (80.9%) than at SKM(56.9%), Loglogo (55.7%) and Bubisa (42.0%), (chisq=23.3 , p=0.000) and pit latrines (59.2%), which was significantly higher at Loglogo (77.1%) and SKM (69.2%) than at Maikona (45.6%) and Bubisa(40.9%), (chisq=22.3, p=0.000). However washing soaps was reportedly available at 16.2% of the facilities and was significantly higher at SKM (39.7%) and Bubisa (21.0%), than other schools, (chisq=50.8, p=0.000) and hand sanitizers were available (19.8%) and significantly higher at Maikona (50.0% and Bubisa(19.8%) than other schools, (chisq=63.2 , p=0.000). The respondents from all schools were of the opinion that WASH are very important (47.2%) and important (51.1%).

4.4 Sanitation and Hygiene Problems in Schools

The study assessed the sanitation and hygiene problems in schools. The commonly cited sanitation problems were: inadequate water (56.5%), and poor waste management (33.1%). The commonly cited Hygiene problems were: poor latrine use (64.8%), dirty latrines (20.3%), and poor indoors (14.8%). The commonly mentioned sanitation problems were: inadequate water (56.5%), Bubisa (64.6%), SKM (63%), and Loglogo (97%); poor waste management (33.1%), Maikona (97.1%) and SKM (36.9%); and open Defecation, Bubisa (10.1%). Similarly, the commonly mentioned hygiene problems included: poor use of latrine, Bubisa (44.4%), SKM (93.8%) and Maikona (97.1%); dirty latrines, Loglogo (76.2%) and Bubisa (24.7%); and poor indoors, Bubisa (30.9%) and Loglogo (16.7%).

4.5 COVID-19 Exposure and Visits to Health Facility

The study investigated whether the respondents had been exposed to infections and whether they had visited a health facility for COVID-19 related symptoms. Overall, 52% reported to have visited a health facility in the past month for COVID-19 related symptoms. Those reporting visits in the last month were most common in all schools, but was significantly higher in SKM (60.0%), and Loglogo (70.0%) than at Bubisa (40.9%) and Maikona (30.9%), (chisq=65.5, p=0.000); and never visited, Bubisa (22.2%) and Maikona (30.9%). Reported presence of Covid -19 cases in schools was Bubisa 14 (17.3%), SKM 16 (24.6%), Maikona 7(10.6%) and Loglogo 6 (8.6%).

4.6 Factors Contributing to Poor Uptake of COVID-19 Prevention

The study investigated factors contributing towards poor uptake of COVID-19 prevention in schools. Overall, the commonly cited factors contributing towards poor uptake of COVID-19 in schools were: inadequate facilities (88.7%), lack of enforcement (84%), lack of WASH facilities (79%), lack of funds (77%), poor attitude and ignorance (76%), lack of trained staff (70%) and cultural and religious factors (70%).

Table 2: Factors contributing to poor uptake of CCOVID-19 prevention by School

Factors	Bubisa	SKM	Maikona	Loglogo	Overall	Chissq	p-value
Lack of enforcement	49 (60.5)	60 (92.3)	60 (88.2)	70 (100)	239 (84.2)	51.3	0.00

Factors	Bubisa	SKM	Maikona	Loglogo	Overall	Chissq	p-value
Lacks WASH facilities	46 (56.8)	63 (96.9)	45 (66.2)	70 (100)	224 (78.9)	61.7	0.00
Lack of funds	54 (66.7)	64 (98.5)	30 (44.1)	70 (100)	218 (76.8)	83	0.00
Lack of trained staff	61 (75.3)	64 (98.5)	6 (8.8)	69 (98.6)	200(70.4)	175	0.00
Inadequate facilities	57 (70.4)	64 (98.5)	62 (91.2)	69 (98.6)	252 (88.7)	40.6	0.00
Lack of awareness	29 (35.8)	43 (66.2)	2 (2.9)	68 (97.1)	142 (50.0)	135,8	0.00
Poor attitude & Ignorance	46 (56.8)	62 (95.2)	40 (58.8)	69 (98.6)	217 (76.4)	61.0	0.00
Accessibility	26 (32.1)	25 (38.5)	3 (4.4)	52 (74.3)	106 (37.3)	73.3	0.00
Cultural /religious factors	38 (46.9)	44 (67.7)	55 (80.9)	62 (88.6)	199 (70.1)	36.1	0.00

4.7 Current Initiatives for Implementation of COVID-19 Guidelines in Schools

The study investigated the current school-based initiatives for improving implementation in school. The most commonly identified initiatives in schools were wearing of masks (85.9%), reported significantly higher in SKM (93.8%), Bubisa (91.4%) than at Loglogo (82.9%) and Maikona (75.0%), (chisq=12.6, p=0.000); maintenance of social distance practice (64.4%), significantly higher in Bubisa (70.4%) and Loglogo (75.6%) than at SKM (61.5%) and Maikona (45.6%), (chisq=18.1, p=0.000); use of hand sanitizers (64.1%), significantly higher in Loglogo (87.1%) and SKM (84.6%) than at Bubisa (50.6%) and Maikona (36.8%), (chisq=56.5, p=0.000) and washing hands (54.2%), significantly higher at Bubisa (60.5%) SKM (61.5%) than at Loglogo (52.9%) and Maikona (41.2%), (chisq=7.4, p=0.006). The current interventions for COVID-19 prevention in schools were reported to be effective in all schools (over 97%).

4.8 Current Community Based Factors Influencing Implementation of COVID-19 Guidelines

The study assessed the community-based factors influencing the implementation of COVID-19 guidelines including the existing social-cultural practices and proposed promotive strategies and recommended actions. The social-cultural practices associated with poor implementation of COVID-19 prevention guidelines highlighted includes, participation and involvement in religious and cultural ceremonies (39%), poor attitude, ignorance and illiteracy (63%). The proposed promotive interventions for COVID-19 prevention in school include: promotion of good WASH and waste management practices (25%), civic education (41%), strict rules in schools (23%), and community awareness activities (37%).

Table 3 Current community-based factors influencing COVID-19 implementation of guidelines in school, socio-cultural practices, suggested promotion strategies and recommendations

Community based factors, socio-cultural practices	Factors	Bubisa	SKM	Maikona	Loglogo	Overall	Chisq	P-value
Community based factors, Socio-Cultural practices	Religious-cultural ceremonies	17(21.0)	14(21.5)	40(58.8)	38(54.3)	109 (39.0)	7.0	0.06
	Informal group discussion	2(2.5)	0	41 (60.3)	0	43 (15.1)	37.0	0.000
	Irregular wash/clean habits	2(2.5)	0	10(14.7)	2 (2.9)	14 (4.9)		
	Poor attitude/Ignorance	65(80.2)	53(81.5)	30 (44.1)	31(44.3)	179 (63.0)	40.9	0.000
	Handshaking practices	1(1.2)	0	14(20.6)	0	15 (5.3)		
Covid on track	Covid on track	81(100)	65(100)	64(94.1)	70(100)	280 (98.6)	12.9	0.005
Promotional activities for COVID-19	Good wash /waste practices	8(9.9)	8(12.3)	43(63.2)	12 (17.1)	71(25.0)	70	0.000
	Regular testing & vaccinations	7(8.7)	7(10.8)	27(39.7)	2 (2.8)	25 (8.8)	31.1	0.000
	Civic education	56(69.1)	13(20.0)	38(55.9)	11(15.7)	118 (41.5)	62.8	0.000
	Build disease resilience	0	0	7(10.3)	1 (1.4)	8 (2.8)		
	strict rules in school	7(8.6)	25(38.5)	31(45.6)	4 (5.7)	67(23.6)	48.7	0.000
suggested recommendation	community mobilization/awareness	17(16.3)	26(40.0)	42(61.8)	19(27.1)	104 (36.6)	30	0.000
	Posters/stickers	18(22.2)	21(32.3)	11(16.7)	12 (17.1)	62 (21.8)		
	Radio messages	30 (37.0)	17(26.2)	7(10.3)	11(15.7)	65 (22.9)	17.7	0.000
	Integrate covid in syllabus	7(8.6)	23(35.4)	37(54.4)	3(4.3)	70 (24.6)	63.2	0.000
	Policy enforcement	7(8.6)	10(15.4)	59(86.2)	6 (8.6)	82 (28.9)	146.9	0.000

Table 3 Current community-based factors influencing COVID-19 implementation of guidelines in school, promotional factors, suggestions and recommendations. The community based factors influencing the implementation of COVID-19 identified included: socio-cultural factors leading to poor implementation of the WASH guidelines were participation in social cultural and religious ceremonies significantly higher in Loglogo (54.3%) and Maikona (58.8%) than at Bubisa (21.0%) and SKM (21.5%), (chisq=7.0,p<0.05). Informal discussion groups, significantly higher in Maikona (60.3%), (chisq=37.0,p=0.00); irregular WASH and cleaning practices, higher in Maikona (14.7%) and hand shaking practices, higher in Maikona (20.6%) and the most common practice being ignorance and poor attitude significantly higher in Bubisa (80.2%) and SKM

(81.5%) than at Loglogo (44.3%) and Maikona (44.1%), ($\chi^2=40.9, p=0.000$). The community-based proposed promotional activities for COVID-19 prevention and most common were: conduct of civic education, significantly higher in Bubisa (69.1%), SKM (20.0%) and Maikona (55.9%) while regular testing and vaccination, higher in Maikona (39.7%) and SKM (10.8%). On the other hand, promotion of good WASH /waste management health education was higher in Maikona (63.2%) and as well strict rules in school, higher in Maikona (45.6%) and SKM (38.5%).

The proposed suggestions and recommendations for the national guidelines uses in schools on COVID-19 include: improving community mobilization and awareness, higher in Maikona (61.8%), SKM (40.0%), and Loglogo (27.1%) whereas posters and stickers in school reportedly higher in Bubisa (22.2%) and SKM (32.3%). Radio messages in schools, higher in Bubisa (37.0%) and SKM (26.2%) and policy enforcement reportedly higher in Maikona (86.2%). In addition, needs of trained staff was higher in SKM (26.2%), Maikona (29.4%) and Loglogo (24.3%) whereas the provision of adequate funds was reportedly higher in Bubisa (37.0%), SKM (29.2%) and Maikona (38.2%). The integration of COVID-19 into school syllabus, higher in Maikona (54.4%) and SKM (35.4%).

4.9 Interventions by County and National Government

The study also investigated the level of support from county and national government to schools to implement national guidelines for COVID-19 prevention. As summarized in the table below, the implementation status with regards to the county level support factors towards implementation of sanitation and hygiene national guidelines for COVID-19 prevention in schools included: resource mobilization (34.5%), higher in Loglogo (60.0%) and SKM (36.9%), ($\chi^2=31.5, p=0.000$); adequate funds support (28.2%), significantly higher in Maikona (38.2%) and Bubisa (37.0%), ($\chi^2=21.0, p=0.000$); and provision of trained personnel (23.2%); improvement of vaccine promotion (9.2%) was reported higher in Maikona (36.0%).

5.0 Conclusions and Recommendations

5.1 Conclusions

Based on the aforementioned study's specific research objectives, this study makes key conclusions before specific policy recommendations are presented. With regards to the first objective, the study concludes that the respondents have the knowledge of COVID-19 but are faced by the challenges of accessing essential services to effectively protect themselves and their families. The study has demonstrated that schools in Marsabit county had been prepared to mitigate the effects of COVID-19 pandemic. While knowledge of transmission and prevention were found to be high, access to many of the essential support systems and facilities remain a major challenge. The study provides new evidence showing that although before the study there was scanty information available on the current situation among rural nomadic public schools, data from our findings supports that schools in this region were implementing hygiene and sanitation guidelines for prevention of COVID-19.

Additionally, the study noted that despite the awareness of the threats of COVID-19, key structural, social and behavioural factors contributes to poor uptake of the national guidelines on hygiene and sanitation for effective prevention of the COVID-19 and protection of the pupils and teachers. The key cited factors were: inadequate facilities (88.7%), lack of enforcement (84%), lack of WASH facilities (79%), lack of funds (77%), poor attitude and ignorance (76%), lack of trained staff (70%) and cultural and religious factors (70%). Hence, there is need for greater provision of WASH

facilities, improve on enforcement and compliance checks, address ignorance and poor attitudes to hygiene and sanitation as well as more training and sensitization programmes for the pupils, staff and teachers.

Importantly, with regards to the second objective, the study concludes that while there is considerable effort and initiatives to ensure county level compliance with the national guidelines the challenges are aggravated by the aridity of the region and resource constraints. The fight against COVID-19 through the study confirmed the need for improvement of WASH and compliance with national guidelines for schools as very important. This study confirmed that Marsabit county schools being already water deficient and arid had major constraint in implementation of WASH guidelines for prevention of COVID-19 in schools. Strategies for county and national governments to adopt the WHO/ UNICEF recommendation for school based prevention intervention should be supported. This study highlighted that schools level of implementation was reported high among study schools but there exist major data gaps including lack of data on individual pupils and teachers' practices on availability and use of WASH facilities and services as part of implementation of school based guidelines for prevention of COVID-19. Our findings showed lower availability of water and soap (15%) in schools than the earlier study ASAL Humanitarian Network in 2021 which reported 21 % access to soap among rural nomadic communities. The existing water, sanitation and hygiene facilities are inadequate for the increased pupil population and promote the ratio of pupil to hand washing point and taps, pupil to pit latrine ratios which this study was not able to document. In the specific case of the school environment, the improvement of WASH services will improve education and development of children and adolescents to avoid further delayed due to the spread of other infectious diseases and will promote a clean, healthy and secure space for learning. Hence, the study reveals the need for more targeted support for school in the ASAL areas with a greater focus on making WASH facilities available and hospitable for the school children.

The study was limited in assessment of specific school-based interventions such as social distance, use of face masks by pupils and teachers and workers, the level of sharing of the existing hand wash drums, water tanks, hand washing points and soaps as well as alcohol-based hand sanitizers and latrine sharing ratios. This is a key area for further research – whether the desire of social distancing in schools works under the complex implementation of the Competency Based Curriculum and disparities thereof, especially in rural schools.

Interrogating the third objective of the study, the research concludes that there is need for greater community sensitization and education to reduce ignorance and break social and religious impediments to effective COVID-19 mitigation and control. Relatedly, some inhibiting community-based barriers include issues of overcrowding in schools, places of worship and cultural ceremonies with no social distance, high level of illiteracy, negative attitude, poor use of masks, refusal to take covid vaccines. While majority of the respondents indicated that current interventions are effective for prevention of COVID-19, they also indicated that more efforts and strategies are needed to address ignorance, community members' attitude and arrogance among community members, religious and cultural factors associated with the spread of the disease in the schools and community. It becomes quite clear that the powerful methods of community sensitization and education was through the use of mass media and radios. They also highlighted the need for increased resources and funding by both county and national governments for COVID-19 at school and community level.

Finally, the study concludes that there is need for greater resource mobilization, coherence and coordination among county government, national government and also non-state actors and other stakeholders to ensure maximum impact and efficiency in combatting COVID-19 transmission and prevention. So it is important for the county and national government to devote more budgets to improving access to WASH facilities in schools.

5.2 Recommendations

Principally, the study made critical conclusions based on the findings as guided by the specific objectives of the study. Therefore, based on the study findings above, this study advances key policy recommendations under the following categories as guided by the study's objectives and conclusions.

- i) *Strategies to enhance implementation of hygiene and sanitation measures in response to national guidelines for prevention of COVID-19 in schools*
 - The schools in the ASAL regions are water deficient and this has a major impact on the sound implementation of the hygiene and sanitation guidelines for prevention of COVID-19 in schools. The existing water, sanitation and hygiene facilities are inadequate for the increased pupil population and promote the ratio of pupil to hand washing point and taps, pupil to pit latrine ratios. Improvements in access and adherence to good hygiene practices will not only lead to the qualify health but also early childhood development for the pupils.
 - Beyond awareness and knowledge of the COVID-19 pandemic, the study observed that key structural, social and behavioural factors contribute to poor uptake of the national guidelines on hygiene and sanitation for effective prevention of the COVID-19 and protection of the pupils and teachers. Hence, there is need for greater provision of WASH facilities particularly to the schools in the nomadic ASAL counties.
 - There is also the need for public health officials and school administrators to improve on enforcement and compliance checks.
 - There is need for improved collaboration and coordination between county government, and national government in health and educational agencies, NGOs and development partners to ensure robust and harmonized support to the implementation of the national guidelines for COVID-19 prevention and mitigation. This will ensure greater impact with limited resources.
 - Beyond, the COVID-19 period, it is important for the national government to provide sufficient budgetary support to improve access to WASH facilities in nomadic schools in the ASAL counties.
- ii) *Strategies to address School-based factors that influence implementation of hygiene and sanitation for the prevention of COVID-19*
 - Promotion of school-based training of teachers and school workers in an effort to facilitate impacting on the pupils' prevention of COVID-19 infections.
 - Increased financial support for provision of WASH facilities and hygiene and sanitation services and acquisition of preventive support supplies, inclusive of soaps, alcohol-based hand sanitizers.

- Need for provisions of adequate WASH facilities and uphold cleanliness of the facilities in schools.
- Since children learn a lot from teachers as their role models; there should be greater training and sensitization of teachers for sound implementation of any policy such as COVID-19 guidelines using posters and drama clubs.
- Need for pupils' sensitization on the importance of social distancing. This has implication of expansion of school facilities especially classrooms especially under the current Competency Based Curriculum (CBC).

iii) *Strategies to address Community-based factors/Barriers to Implementation of Hygiene and Sanitation Guidelines for COVID-19 prevention*

- Expansion of community sensitization and education using radio, Televisions and mass media and social media for improved school and community-based prevention intervention for elimination ignorance and arrogance towards COVID-19 and other respiratory related infections.
- To address ignorance and poor attitudes to hygiene and sanitation as well as more training and sensitization programmes of the community members, school committees such as members of Parents Teachers Association, and the larger community through aggressive community mobilization using radio, mass media and televisions at both the school and community level.

iv) *Strategies to Strengthen Country level support for COVID-19 Guidelines for Schools*

- The County Government of Marsabit needs enhanced financial support from national government and development partners to implement hygiene and sanitation and infection prevention and control measures in schools as this will help stop the spread of COVID-19 and keep children safe while also protecting children from other sanitation and hygiene related diseases, which will potentially lead to safe and effective learning environment.
- This study has shown that the basic water services in the study school were inadequate to meet the needs of children in schools in ASAL areas. The county and national governments should increase the level of surveillance and assessment of WASH services, and level of access by pupils and teachers.

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