

# Female students' perceived self-esteem based on availability of sanitary facilities among public secondary schools in Monduli District, Tanzania

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**ABSTRACT:** This study sought to describe and establish correlation between female students' perceived self-esteem and availability of sanitary facilities among public secondary schools in Monduli District through descriptive statistics and Pearson correlation. Using survey design, data were collected through questionnaire whereby purposive and simple random sampling determined 320 female students from 8 schools to participate. Validity and reliability of above 0.7 Cronbach's alpha were established through expert judgment and statistical analysis respectively. The study concluded that amount of water supply is adequate and constant in schools although water taps for hand washing were nonexistent. School toilets did not have doors and locks for privacy. They were not clean and neat and there were no disposal bins for menstrual pads in the toilets. Further, there is limited access to soaps and sanitation facilities for hand washing. However, students perceived existence of good sanitation and hygienic condition in their schools and considered themselves to be self-esteemed. There is a significant positive relationship between self-esteem and sanitation and hygiene and between quality of toilets and availability of water. Therefore, there is need for schools to fix water taps for hand washing in order to enhance sanitation and hygiene condition and improve health of female students. There is also need for schools to fix doors and locks in school toilets for privacy and safety, disposal bins for used menstrual pads and soaps and sanitation facilities for effective hand washing.

**Keywords:** Female students, hygiene, Monduli, sanitation, self-esteem, Tanzania, toilet, water.

## INTRODUCTION

Self-esteem is defined by various authors in various ways. According to Fiest (2006) in Gancia and Santiago (2017), for instance, it is a self-evaluative part of the self-concept, the judgment the children make about their overall worth. Olea et al. (2012) further consider it as a personal opinion of an individual about herself/himself and the appreciation of his/her worth or an accurate, justified and balanced appreciation of one's worth as a person and it is literally measured by how much value people place on themselves and it is the evaluative component of self-knowledge. According to Emler (2001), self-esteem is defined as a favourable opinion of oneself. It is an essential aspect for students' academic success.

According to Igomu and Muyange (2013) in Makewa and Ngussa (2017), self-esteem is one of influential factors which can affect student's personal development. Importance of self-esteem is further explained by Blascovich and Tomaka (1991) in Olanrewaju and Joseph (2014, p. 170) who consider it as "an essential component of good mental health, an individual's sense of his or her value or worth or the extent to which a person values, approves of, appreciates, prizes, or likes him or herself." Olanrewaju and Joseph (2014) quote Coopersmith (1967, 1981) who defines self-esteem as a "set of attitudes and beliefs that a person brings with him or herself when facing the world, including beliefs as to whether he or she can

expect success or failure. Katz (2000, p. 7), in Emler (2001, p. 12), contends that if there were ever a magic bullet that could transform a young person's life it would be a pill coated with self-esteem. He further maintains that this powerful yet fragile quality is the key to the future for a teenager. Therefore, it is important to identify factors associated with self-esteem so that school systems may do their best to create avenues for students to acquire as higher self-esteem as possible and avoid those factors which may prevent them to reach the same.

According to Park et al. (2016), self-esteem is positively associated with satisfaction with school sanitation. Maddox (1994) refers to sanitation as prevention of contamination of harmful microorganisms by the adoption of sound hygienic practices commonly known as sanitation procedures. As argued by Anand and Prakash (2018), the fundamentals of conscientiousness for the continuance of sanitation should be incorporated in childhood, which is essential for a healthy childhood and adulthood, leading to form a healthy society. On the contrary, while water, sanitation and hygiene are of great importance in school systems for effective health of school stakeholders including students, teachers and support staff, Nyanza et al. (2018, p. 1), revealed that "lack of safe water, sanitation and hygiene remains one of the most pressing global health issues of our time."

In their study, Anand and Prakash (2018) found out that while students must wear clean clothes, untidy and dirty clothes, which may result from inadequate supply of water, to a large extent, affects confidence and self-esteem of students. Therefore, when school environment does not cater for health related needs, self-esteem of female students, especially during their menstrual periods, is likely to be negatively affected. According to Mann et al. (2004) in Park et al. (2016), lower self-esteem plays a critical role in the development of mental disorders and social problems such as depression, anorexia nervosa, bulimia, anxiety and violence. Anand and Prakash (2018) reveal that regular dirty clothing which may result from inadequate supply of water, leads to ectoparasitic infestations and fungal infections. When students get sick, they will spend most of their time in treating their diseases rather than concentrating in their studies, which may negatively affect their academic performance. They therefore advise that female students must know the importance of washing their genitals daily with mild soap and water.

Hygiene and sanitation issues cut across African countries. Schools with adequate water, sanitation and hygiene facilities are characterized by a reliable system that provides safe and sufficient water especially for hand-washing and drinking, sufficient and private number of toilets for students and teachers, water-use and hand-washing facilities. Yet many schools in low-income countries have inadequate access to water facilities, proper sanitation and hygiene promotion (McMichael, 2019). In Uganda, for instance, the issue is serious. By the

year 2000, the population in Ugandan schools at primary level increased from 2.5 million in 1995 to 6.5 million in 1999. This was a 62 percent increase due to the implementation of Universal Primary Education (UPE) policy, which entitles all school-age children to free primary education. This resulted into most schools lacking basic sanitary facilities, causing the number of students per latrine stance to exceed 700 in some schools (Bitature and Sidibe, 2000). The study confirms high levels of pupil knowledge of hygiene and sanitation issues, but translation into behavior still remained a problem. In all the schools visited, the pupils were generally clean, and those interviewed were aware of the problems associated with poor sanitation. Hygiene knowledge was very high, although practice was still low (Ibid).

Like Uganda, Kenya also faced challenges with regard to sanitation and hygiene in school systems. Cross-sectional surveys in the country were performed in 62 primary schools during unannounced visits whereby only 60% of the schools had hand washing water, only 13% had washing water in latrines for menstruating girls, and only 2% had soaps (Alexander et al., (2014). A study conducted in Ghana discovered facility deficiency whereby 33% of schools had students washing their hands in a shared receptacle (bowl), 24% had students using a single cotton towel to dry hands after hand washing, and only 16% of schools had a functional water facility. Furthermore, only 3% of schools which had functional water facilities also had a functional hand washing stations (Appiah-Brempong et al., 2018). While issues related to hygiene and sanitation to female students is global, Tanzania is not exceptional. In the country, challenges related to hygiene and sanitation are rampant. As indicated by Thomas et al. (2013), there is ever present problems of water related parasitic infections such as malaria and schistosomiasis. Prevalence of these infections is linked to poor sanitation and hygiene. In particular poor access to latrines, poor hand washing behavior and inadequate drainage can be responsible for this issue.

According to Ilo et al. (2016), adolescents, especially in developing countries such as Tanzania face numerous challenges, which could be inimical to their health. Such challenges include those associated with hygiene during menstruation. They further maintain that hygiene-related practices of women during menstruation are of considerable importance, as it has a health impact in terms of increased vulnerability to reproductive tract infections. When the health of female learners is not stable, their self-esteem is likely to be negatively affected and as a result, they will not be comfortable during teaching and learning session and therefore, their academic performance is likely to be negatively affected. Although there are numerous factors that may affect students' self-esteem, the purpose of this study was to establish female students' perceived self-esteem based on availability of sanitary facilities in public secondary schools in Monduli District, Tanzania, under the following research questions: (1)

What is the perception of female students on availability of water in public secondary schools of Monduli District? (2) What is the perception of female students on availability and quality of toilets in public secondary schools of Monduli District? (3) What is the perception of female students on quality of sanitation and hygiene in public secondary schools of Monduli District? (4) What is the perception of female students on their self-esteem among public secondary schools in Monduli District? (5) Is there significant relationship between self-esteem and availability of water, quality of toilets and sanitation and hygiene among public secondary schools in Monduli District? Therefore, the objective of this research was to describe and establish correlation between female students' perceived self-esteem and availability of sanitary facilities in public secondary schools in Monduli District. The findings will benefit female students since recommendations given at the end of the study will help school administrators to ensure good sanitary and hygiene atmospheres for quality living in schools.

## LITERATURE REVIEW

### Theoretical framework

The study was guided by the theory of needs by Abraham Maslow (McLeod, 2018). Maslow's hierarchy of needs as motivational theory in psychology comprises a five-tier model of human needs, depicted as hierarchical levels within a pyramid. The needs lower down in the hierarchy must be satisfied before individuals can attend to needs higher up. From the bottom of the hierarchy upwards, the needs are: physiological, safety, love and belonging, esteem and self-actualization. In this study, it is assumed that when basic needs including water and sanitary facilities are met, the learners are likely to achieve the next level needs which include self-esteem. When these secondary needs are met, the learner has a possibility of reaching the tertiary needs namely self-actualization, which are the highest needs. These needs have to do with achievement of one's full potential which is maximization of academic performance which is the ultimate goals for students to attend schools.

### Studies on self-esteem and learning effectiveness

Studies indicate a correlation between good academic performance and learners' self-esteem. Afari and colleagues (2012) in Alyami et al. (2017), for instance, examined the relationship between self-esteem and academic performance among 225 college students and found a significant positive correlation, suggesting high self-esteem is associated with high academic achievement. Vialle et al. (2005) in their study about the relationship between self-esteem and academic achieve-

ment in high ability students established an existing relationship between self-esteem and academic achievement as one that is regarded by many educators as a well-established fact.

Arshad et al. (2015) assessed the self-esteem and academic performance among university students in Pakistan and established a significant relationship between self-esteem and academic performance. They found that the higher the self-esteem, the better the academic performance. Therefore, they recommended that teachers must establish conducive avenues through which the self-esteem of students can be increased so that the good performance in academic subjects can as well be realized. Mandap (2016) adds that students with higher self-efficacy and self-esteem are more confident with their skills and abilities and can respond positively despite the difficulty of their work.

In their study about self-esteem and its correlates among university students, Olea et al. (2012) argued that for students to be able to perform well academically, they should have positive self-esteem. Also, further findings of Covington (1989) as cited by Olea et al. (2012) shows that when the level of self-esteem was enhanced, there was a corresponding increase in academic performance, whereas, the academic performance declined when there was a decrease in self-esteem.

According to Gancia and Santiago (2017), self-esteem is important for any individual because it determines their strength and weakness. The importance of self-esteem among students is further brought to view by Noronha et al. (2018) who argue that children with high self-esteem usually feel good about themselves, they are able to resolve their conflicts with other children and they are resistant to deal with problems. They further maintain that a satisfaction of self-esteem needs generates feelings and attitudes of self-confidence, self-worth, capacity and the feeling of being useful and necessary in the world. On the contrary, the frustration of these needs leads to feelings and attitudes of inferiority, ineptness, weakness, passivity, and dependency, which may reduce chances for secondary school students to reach their full potentials. Therefore, much has to be done to boost the self-esteem of students in secondary schools.

### The concept of water and sanitation in schools

The World Health Organization (2000) in Eshun et al. (2014) defines sanitation as the provision of facilities and services for the safe disposal of human urine and faeces. Inadequate provision of these facilities is a major cause of diseases. On the contrary, smart investments in sanitation can reduce disease, increase family incomes, keep girls and boys in school, help preserve the environment, and enhance human dignity (Eshun et al., 2014).

According to Mitchell (2015), sanitation is a key factor for optimizing health especially in developing countries where

millions of children die every year from diarrhea illness, malnutrition and chronic ill health from parasites caught due to poor sanitation. He further considers latrines as cornerstone for effective sanitation because they separate human beings from their urine and faecal waste, providing a place for such waste to decompose, which tends to kill such viral, bacterial and parasitic diseases that can be spread by urine and faeces. Therefore, when school environment is characterized with good sanitation, students, teachers and other school stakeholders are protected from potential diseases.

Lelieveld et al. (2005) argue that because human beings are natural carriers of harmful microorganisms, personal hygiene is of great importance for the maintenance of health in general. They further consider hair, skin, mucous membranes, digestive tract, wounds, infections and clothing as major sources through which contamination of harmful microorganisms can be shared from one human being to another. They finally argue that personal hygiene practices like hand-washing, dental care, avoidance of spitting and daily showering are simple measures to prevent diseases.

According to Coppens (2005) in Eshun et al. (2014), school sanitation and hygiene education are necessary to produce a healthy school environment to develop or support safe hygiene behavior. While this is important to all human beings, it is necessary to ensure good sanitation and hygiene to female students. This is supported by Frisone (2017) who argues that while it is true that all learners need a sanitary and hygienic learning environment, girls are likely to experience greater negative impact due to lack of adequate sanitation and hygiene facilities in schools than boys. This is due to their physiological set up which is unique and needs more attention than the boys. While all children need a sanitary and hygienic learning environment, lack of adequate sanitation and hygiene facilities in schools has a greater negative impact on girls than on boys. Girls need more safe, clean, separate and private sanitation facilities in schools. Adolescent girls are especially vulnerable to dropping out as many are reluctant to continue their schooling because toilet and washing facilities are not private, not safe or simply not available. When schools have adequate facilities – in particular those that facilitate menstrual hygiene – a major obstacle to consistent attendance is removed (Ibid). Therefore, when safe, clean, separate and private sanitation facilities are missing in schools, the adolescent girls are more vulnerable to dropping out of schools. On the contrary, when schools have adequate facilities that facilitate menstrual hygiene, a major obstacle to consistent attendance is removed and therefore, adolescent girls are likely to attend school regularly, which increases their chance to meet their full potential as a result of school attendance.

According to Olanipekun and Babatunde (2016), environmental health issues are major risk factors in the global burden of disease. When students become sick,

they are likely to spend more time for treatment and therefore, this may reduce their rates of school attendance, and as a result, their academic performance is likely to be affected. They quote McMichael et al. (2001) who argue that the third leading cause of death in low and middle income countries in sub-Sahara regions in Africa are related diarrhea issues which closely link with environmental risk factors especially when considering the death of children from the age of 0 to 14 where secondary school students belong. Therefore, it is important for school authorities to ensure healthy environment for learners' good health. When school environmental health facilities are not good, students are likely to acquire diseases which in turn will affect their academic life. While this applies to all students, female students can be more affected due to their physiological set up which requires them to experience monthly period of menstruation. Therefore, special care needs to be given to female students for maximization of reasonable sanitation and hygiene for them to be happy and enjoy their school life.

### **Significance of water system in school environment**

Water is one of the most basic needs without which human beings cannot survive. Mooijman (2012) in Antwi-Agyei et al. (2017) argues that adequate water supply in schools is a pre-requisite for the right to basic education for school children. According to Schaffner and Schaffner (n.d), the significance of water in the body is due to the fact that three fourth or 75% of the body weight of human beings is water. While water is needed for its work to pass out poisons through kidneys, the kidneys are special cleansing filters for the blood and water is necessary for this exercise. If a person has not taken enough water, this exercise cannot be accomplished successfully. It is therefore necessary to make sure that children at school are supplied with enough water for their bodies to function smoothly.

According to UNICEF (2018), when children have access to safe water, toilets and soap for hand washing at school, they have a better environment to study, to learn and to realize their full potential. Furthermore, when schools have safe water, toilets and soap for hand washing, they will be in a healthy learning environment, and as a result, girls are more likely to attend when they are on their menstrual periods. Furthermore, children who learn about safe water, sanitation and hygiene habits at school can reinforce positive life-long behaviors in their homes and their communities. When schools experience scarcity of water, the time of students will be dedicated in fetching water rather than in concentrating on studies. Something, this consumes a lot of time and therefore reduce their study time (Kibakaya, 2017)

Kibakaya (2017) reports one of female students say, "we don't have ... water at school, so we are supposed to fetch it in the nearby ponds, or sometime trek for hours to get water from the river so that we can use it in toilets and for

cleaning the school.” The other student commented, “In our school there is a place where we fetch water but it is not for free. They sell it from 50 shillings to 200 shillings, depending on the size of your container.” She also adds that, “This situation has placed some girls to fall into temptation from men who offer them money to buy water needed in schools.

While water is necessary for proper functioning of human body, it is necessary to take in safe and clean water. According to Schaffner and Schaffner (n.d), urine and many other things that cause diseases are often washed into water by the rain. To be truly safe, all drinking water should be boiled or treated against potential germs which can cause outbreak of diseases. Therefore, it is advisable that people should be encouraged to wash their hands thoroughly after using the toilet because thorough washing of the hands after using of the toilet and before each meal keeps disease germs out of the body (Ibid).

According to Orimoloye et al. (2015), water, sanitation and hygiene practice form an important aspect of environmental public health in disease prevention and control. They argue that it is impossible to separate issues of water and sanitation, including hygiene from life as they impact significantly on the health and general wellbeing. According to Olukanni (2013), the provision of safe water in schools is necessary to improve health, boost educational achievement, and promote gender equity which has a positive impact on the society. The study of Kumar and Rajendran (2016) indicated that poor water and sanitation facilities in schools can spread diseases such as diarrhea and worm infections. These diseases may lead to poor attendance of not only students but also teachers. Therefore, it is necessary for school authorities to ensure clean and safe water availability and necessary equipment for effective water supply.

### **School water, sanitation and hygiene in the global**

Studies have indicated that sanitation and hygiene is a global issue that faces educational institutions. Particularly, the global trend of water sanitation is indicated by UNICEF (2018) with the following ten facts: (1) globally, only 69 percent of schools have a basic drinking water service. (2) One in four primary schools and one in six secondary schools have no drinking water service. (3) Nearly 600 hundred million children lack a basic drinking water service at their schools. (4) Globally, only 66 per cent of schools have a basic sanitation service. (5) One in five primary schools and 1 in 8 secondary schools have no sanitation service. (6) One third of schools in sub-Saharan Africa and Oceania have no sanitation service. In most countries where data is available, less than 50 per cent of schools have toilets accessible to students with limited mobility. (7) Globally, 600 million children do not have a basic sanitation service at school. (8) Nearly 900 million children worldwide lack a basic hygiene service at their

schools. (9) One in three primary schools and over a quarter of secondary schools have no hygiene services. (10) Over one third of schools worldwide and half of schools in the least developed countries have no hygiene services.

A study by Grossi et al. (2016) in European region sought to establish status of water, sanitation and hygiene in schools in the pan-European region. Data was collected through scientific literature and national surveys. The study reports several deficiencies with regard to water, sanitation and hygiene. Particularly, policies in schools were found to be in place and national targets or programmes had been approved in many countries. However, the enforcement mechanisms were not always well established and policies and plans were often not fully implemented and financed. Furthermore, the study established that water may be absent, intermittent, unsafe and/or hard to access, far away or not allowed in class. Toilets were frequently reported to be dirty, overcrowded and smelly. Soap, toilet paper and disposal bins were insufficient. A study by UNICEF (2016) in Palestinian Government schools established that too many schools are still inadequately equipped with toilets, hand washing facilities and drinking water points despite an encouragingly increasing number of such facilities in schools compared to 2011. Furthermore, lack of cleanliness, soaps, toilet papers and sanitary pads remained a challenge at a time when Palestinian students are increasingly provided with high levels of information on hygiene. Therefore, hygiene and water related issues are crosscutting, touching not only developing but also developed countries.

### **School water, sanitation and hygiene in West Africa**

In West African countries, school sanitation and hygiene faces serious challenges that lead to students' poor health and failure to attend school regularly. This is indicated by Gyabaah and Ackerson (2009) who investigated on sanitation in basic schools in Tano South District in Ghana and came up with the fact that out of the 30 selected schools 53% were without toilet facilities while 83% were without safe water on site. The study further established that in majority of the schools, waste materials are burned on the campus during class periods. Finally, while students wash their hands before eating, only 30% wash their hands with soap. This is a serious problem that may result into diseases and in that way prevent students from regular school attendance. Another study by Prah (2018) in Cape Coast, Ghana found out that the state of sanitary facilities in the halls and lecture theatres were good but most halls were found to be overcrowded with insufficient toilets and wash rooms for students, even though the toilets were clean. Furthermore, accommodation and sanitation facilities in the halls were found to be inadequate and availability of soaps and anal cleaning materials was found

to be inadequate.

Olukanni (2013) assessed water, sanitation and hygiene program in public secondary schools in South-Western Nigeria and established that many of students in schools visited were not enlightened on the importance of hygiene education and attitudes towards regular practices concerning water, sanitation and personal hygiene. Only three out of 12 schools visited during the investigation had drinking water points. The water from the borehole was pumped and stored in the overhead water tanks which were then connected through pipes to link other points for accessibility. However, this source of water was not treated before use. Similarly, the school teachers were not acquainted with the knowledge of ensuring enabling environment and promoting continual awareness campaigns to the students. This is a big challenge because even when the school have water and sanitary equipment and facilities, if students are not educated on how to use such facilities for their health, little can be accomplished in attempt to ensure good health in schools.

### **Water, sanitation and hygiene in east African countries**

In Kenya, studies have indicated serious issues related to sanitation and hygiene in primary and secondary schools. Alexander et al. (2014, p. 1454), for instance, conducted a study prior to a menstrual feasibility study in rural Kenya, through unannounced visit in 62 primary schools. Their findings indicate that “only 13% had washing water in latrines for menstruating girls and only 2% had soaps. Latrines were structurally sound but only 16% were clean. Most schools (84%) had separate latrines for girls, but the majority of toilets had no locks.” Barasa (n.d) assessed sanitation and hygiene in public primary schools in Kakamega Municipality in Kenya and found out that the state of sanitary facilities in schools was poor, unmaintained and inadequate in almost 50% of schools. This condition resulted into pupils’ suffering from communicable diseases like diarrhea, flu, and typhoid which could be prevented by improving sanitation in schools.

In Uganda, the issue of water, sanitation and hygiene is also serious. By the year 2000, for instance, the population in Ugandan schools increased from 2.5 million in 1995 to 6.5 million in 1999. This was a 62 percent increase due to the implementation of Universal Primary Education (UPE) policy, which entitles all school-age children to free primary education. This resulted into most schools lacking basic sanitary facilities, causing the number of students per latrine stance to exceed 700 (Bitature and Sidibe, 2000).

### **School water, sanitation and hygiene in Tanzania**

Like many other countries in the world, Tanzania experiences serious problems with regard to water, sanitation and hygiene in school systems. This is revealed by Antwi-Agyei et al. (2017) who assessed the intermediate outcome of

the Tanzanian national sanitation campaign for schools and came up with the findings that only 50% of schools under investigation met the Tanzanian guideline of 50 boys per drop hole while 43% met the guideline of 40 girls per drop hole. In addition, only 53% of schools had a reliable water supply, 43% had some functional hand washing stations and only 29% and 19% had water and soap available at the stations, respectively.

Taylor (2009) investigated the current state of the water, sanitation and hygiene sector in Tanzania, with a particular focus on women and children and came up with finding that water, sanitation and hygiene facilities and practices in schools has attracted very little attention from policy makers and donors, despite its critical importance for reducing the risk of infections in health facilities and for protecting children in schools. The study further revealed that 30% of all neonatal deaths in Tanzania are related to infections or diarrhea, only 34 percent of all health facilities have a regular access to year round water supply and 37 percent do not have a client latrine.

According Kessy and Mahali (2016), “it is evident that over the past two decades, access to safe and clean water in rural areas of Tanzania has not shown significant improvement.” The study further revealed that the share of rural households with access to safe and clean water had only changed from 45% in 2004/05 to 57% in 2012. During the same period, deterioration has been observed in urban areas (a decline from 79% to 77%). As far as secondary schools are concerned, the study findings revealed that access to basic school sanitation had far below the standards set out by the ministry responsible for education.

## **RESEARCH METHODOLOGY**

### **Research design**

This study employed survey research design. According to Babie (1990) in Creswell (2009), survey provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. It includes the use of a questionnaire for data collection, with the intent of generalizing from a sample to a population. A questionnaire was therefore constructed for students under investigation to fill.

### **Population and sampling**

While Monduli District has eight public secondary schools, selection of the sample based on the advice of Mugenda and Mugenda (2003) who have it that in sampling, one needs to select a number of individuals for a study in such a way that the individuals selected effectively represent the large number of the total population. This study used both simple random and purposive sampling to determine the sample. According to Creswell (2009), simple random

sampling is a procedure in quantitative research for selecting participants in such a way that each individual has an equal probability of being selected from the population, ensuring that the sample will be representative of the population. On the other hand, Koul (1997) considers purposive sampling, as a process of selecting the sample at the discretion of the researcher who exercises his own judgment based on experience for including a given subject in the sample. Mugenda and Mugenda (2003) further add that purposive sampling is a procedure that allows a researcher to use cases that have the required information with respect to his or her objectives. Based on this background, form three students were purposively selected due to their long-time experience in schools than their form one and form two counterparts. Form fours were left out because they were in national examination preparation, and therefore, engaging them in research would interfere with their final preparations for the national examinations. As far as simple random sampling is concerned, a stream of form three students from each school was randomly selected. As a result, the total of 320 students filled the questionnaire.

### Validity and reliability

Content validity approach was employed in this study. According to Cohen et al. (2000), to establish this form of validity, the instrument must show that it fairly and comprehensively covers the domain or items that it purports to cover. Therefore, a team of five research experts from the University of Arusha looked into the content of the questionnaire and gave advice for improvement before the questionnaire was used in the field. Furthermore, the questionnaire was subjected to pilot testing whereby 40 students from one private school filled it for pilot testing. As seen in Table 1, the Cronbach's Alpha for each variable was above 0.7 which means the questionnaire was reliable for data collection.

## ANALYSIS AND INTERPRETATION OF RESULTS

Analysis of data involved both descriptive and inferential statistics. The first four research questions were analyzed through descriptive statistics while the fifth research question called for hypothesis testing and therefore was treated through Pearson Correlations.

### Descriptive analysis of data

The questionnaire had four variables to which students responded to indicate their perceptions by ticking appropriate options ranging from 4 - strongly agree, 3 - agree, 2 - disagree and 1 - strongly disagree. Scale of mean score interpretation was as follows: 3.50-4.00 =

strongly agree, 2.50-3.49 = agree, 1.50-2.49 = disagree and 1.00-1.49 = strongly disagree.

### ***Research question 1: What is the perception of female students on availability of water in public secondary schools of Monduli District?***

This research question sought to determine the perception of female students on availability of water in schools. Students were required to indicate their perceptions using five items in the questionnaire as indicted in Table 2. The overall mean score for female students' perception on availability of water was 2.61 which falls within the agreement zone, meaning students generally agreed that water is available in their schools.

Particularly, they agreed that there is accessibility to drinking water in their schools. Furthermore, the amount of water supply was perceived to be adequate and constant. According to Orimoloye et al. (2015), the role water plays in human survival cannot be overemphasized. They argue that availability of water in schools forms an important aspect of environmental public health in prevention and control of diseases, especially water and sanitation related diseases. It is therefore worthy noting that students perceived availability of water in their schools. However, students disagreed that there are water taps in their schools for hand washing. This is a common problems in schools that are in developing countries as reflected in study findings from Ghana by Appiah-Brempong et al. (2018) who discovered facility deficiency in many schools whereby 33% of schools had students washing their hands in a shared receptacle (bowl), 24% had students using a single cotton towel to dry hands after hand washing, and only 16% of schools had a functional water facility. Therefore, much as water is perceived to be available, something has to be done to make sure that schools are supplied with numerous water taps for easy and friendly access to water services.

### ***Research question 2: What is the perception of female students on availability and quality of toilets in public secondary schools of Monduli District?***

This research question sought to establish perception of students on availability and quality of toilets in their schools. This goal was necessitated by the fact that when schools have adequate equipment including quality toilets that facilitate menstrual hygiene, a major obstacle to consistent attendance is removed and therefore, adolescent girls are likely to attend school regularly. In Table 3, the overall mean score for students' perception on availability and quality toilets was 2.19 which falls within the disagreement zone, meaning students generally disagreed that their schools had quality toilets.

Although students agreed that the school has a place for bathing, they disagreed with the rest of statements. They

**Table 1.** Reliability analysis results.

SN	Variable in Question	Cronbach's Alpha	Status
1.	Hygiene and Sanitation	0.743	Reliable
2.	Quality of Toilets	0.773	Reliable
3.	Availability of Water	0.746	Reliable
4.	Self Esteem	0.799	Reliable

**Table 2.** Perception of female students on availability of water.

SN	Item	Mean	Interpretation
1.	Drinking water is available at my school	2.82	Agree
2.	There is accessibility to drinking water at school	2.75	Agree
3.	The school has adequate and regular water supply	2.59	Agree
4.	Water supply is constant at my school	2.52	Agree
5.	There are water taps for hand washing in school compounds	2.36	Disagree
	Overall mean score	2.61	Agree

**Table 3.** Availability and quality of toilets.

SN	Item	Mean	Interpretation
1.	The school has a place for bathing	2.74	Agree
2.	Toilets in my school have doors and locks for privacy	2.47	Disagree
3.	Toilets in my school are clean and neat	2.34	Disagree
4.	My school has safe and comfortable toilets	2.29	Disagree
5.	School toilets have disposal bins for used menstrual pads	2.29	Disagree
6.	Toilets in my school have enough running water	1.93	Disagree
7.	School toilets have facilities for hand washing	1.82	Disagree
8.	Toilets in my school have soap for hand washing	1.57	Disagree
	Overall mean score	2.19	Disagree

specifically disagreed that school toilets have doors and locks for privacy, which suggests lack of safety needs. According to Lunenburg and Ornstein (1991), safety is measured by ability to protect against danger, threat and deprivation. McShane and Glinow (2010) further argue that safety needs enhance safe and stable environment for effective learning.

Furthermore, students perceived that school toilets are not clean and neat, they are not safe and comfortable and they do not have disposal bins for used menstrual pads. These findings are similar to those in Palestian government schools where schools are inadequately equipped with toilets, hand washing facilities and drinking water points. Therefore, poor quality of toilet is a global challenge that face school systems especially in developing countries. Furthermore, students disagreed that toilets have enough running water and perceived a limited access to soaps and sanitation facilities for hand washing. According to Kumar and Rajendran (2016), poor water and sanitation facilities in schools can spread diseases such as diarrhea and worm infections. Therefore,

there is need for schools to ensure that these deficiencies are rectified.

***Research question 3: What is the perception of female students on quality of sanitation and hygiene in public secondary schools of Monduli District?***

This research question sought to establish perception of female students on quality of sanitation and hygiene. According to the World Health Organization (2000) in Eshun et al. (2014), sanitation is the provision of facilities and services for the safe disposal of human urine and faeces. Inadequate provision of these facilities is a major cause of diseases. The overall mean score for students' perception on sanitation and hygiene was 3.08 which means students agreed with statements in the questionnaire as shown in Table 4.

Particularly, they agreed that there are shops near school compounds which sell sanitary pads, schools have places for burning menstrual used pads, school environ-



**Table 4.** Quality of sanitation and hygiene.

SN	Item	Mean	Interpretation
1.	There is a shop near school compound which sales sanitary pads	3.33	Agree
2.	My school has a place for burning menstrual used pads	3.31	Agree
3.	School environment is clean and neat	3.14	Agree
4.	School compound has bins for disposal of waste materials	3.04	Agree
5.	School environment is conducive for menstrual challenges	2.92	Agree
6.	I always have pocket money for purchasing menstrual pads for monthly periods	2.76	Agree
	Overall mean score	3.08	Agree

**Table 5.** Self-esteem.

SN	Item	Mean	Interpretation
1.	My fellow students treat me as useful member in the learning process	3.43	Agree
2.	I feel respected by people who surround me	3.36	Agree
3.	I am creative in academic and personal duties	3.33	Agree
4.	I feel self confident about my academic performance	3.26	Agree
5.	My ability to make decisions is high	3.24	Agree
6.	I feel self valued by my fellow students and teachers	3.20	Agree
7.	I feel safe and comfortable at my school	2.95	Agree
	Overall mean score	3.25	Agree

ments are clean and neat, and that school compounds have bins for disposal of waste materials. Furthermore, they agreed that they always have pocket money for purchasing menstrual pads for monthly periods. The prevailing quality of sanitation and hygiene can be a factor for enhancing good health which will predict regular attendance to schools. This is supported by Eshun et al. (2014) whose study in Ghana came up with an observation that smart investments in sanitation can reduce disease, increase family incomes, keep girls and boys in school, help preserve the environment, and enhance human dignity. Therefore, it is encouraging to find that students under investigation perceived that good sanitation and hygiene exist in their schools.

**Research question 4: What is the perception of female students on their self-esteem among public Secondary Schools in Monduli District?**

This research question sought to establish perception of female students on their self-esteem. The overall mean score of responses as shown in Table 5 was 3.25, which denotes agreement. Mean score for specific items in this section also fall within the agreement zone which means students agreed with statements in the questionnaire, and therefore considered themselves to be confident. Importance of self-esteem for students is brought forth by Jerome (2013) who argues that when one achieves self-

esteemed, he or she will feel self-confident and valuable as a person in the world. But when these needs are frustrated, the person feels inferior, weak, helpless and worthless. It is therefore noteworthy that students consider themselves to be self-esteemed.

Particularly, students agreed that their fellow students treat them as useful members in the learning process, they feel respected by people who surround them, they are creative in academic and personal duties and they feel self-confident about their academic performance. Also, they agreed that their ability to make decision is high and that they feel safe and comfortable at their schools. Significance of self-esteem for students' academic performance is indicated by Afari and colleagues (2012) in Alyami et al. (2017), who has it that high self-esteem is associated with high academic achievement.

### Hypothesis testing

This section dealt with hypothesis testing for the fifth research question which sought to establish the relationship between female students' perceived self-esteem based on availability of sanitary facilities. The testing of hypothesis was done through Pearson Correlation Coefficient. Nature of existing correlations between variables would be either positive or negative and was interpreted based on the following criteria:  $\geq 0.70$  = strong relationship,  $\geq 0.50$  = moderate relationship and  $\leq 0.50$  = weak relationship.

**Table 6.** Correlations between variables.

		Sanitation & Hygiene	Toilet	Water	Self Esteem
Sanitation & Hygiene	Pearson Correlation	1	0.235**	.289**	0.461**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	320	319	319	318
Toilet	Pearson Correlation	0.235**	1	0.368**	0.461**
	Sig. (2-tailed)	0.000		0.000	0.000
	N	319	319	318	317
Water	Pearson Correlation	0.289**	0.368**	1	0.385**
	Sig. (2-tailed)	.000	0.000		0.000
	N	319	318	319	317
Self Esteem	Pearson Correlation	0.461**	0.461**	0.385**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	318	317	317	318

\*\*Correlation is significant at the 0.01 level (2-tailed).

**Research question 5: Is there significant relationship between female students' perceived self-esteem and availability of sanitary facilities in Public Secondary Schools in Monduli District?**

This research question called for testing of a null hypothesis which states: *there is no significant relationship between female students' perceived self-esteem and availability of sanitary facilities in Public Secondary Schools in Monduli District.* Table 6 indicates existence of a number of relationships among variables. Therefore, the null hypothesis is rejected and it can be inferred that there is a significant positive relationship between the dependent variable namely self-esteem and independent variables such as water, toilets and sanitation and hygiene.

First, there is a significant positive relationship between self-esteem and sanitation and hygiene ( $r = 0.461$ ,  $p = 0.000$ , between self-esteem and quality of toilets ( $r = 0.461$ ,  $p = 0.000$ ) and between self-esteem and availability of water ( $r = 0.385$ ,  $p = 0.000$ . Secondly, there is a significant positive relationship between sanitation and hygiene and availability of water ( $r = 0.289$ ,  $p = 0.000$ ) as well as between sanitation and hygiene and quality of toilets ( $r = 0.235$ ,  $p = 0.000$ . While effective sanitation and hygiene is positively correlated with availability of water and quality toilets, positive attitude of female students toward sanitation and hygiene in their schools can therefore be enhanced through provision of quality toilets and availability of water. Thirdly, there is a significant positive relationship between availability of water and quality of toilets ( $r = 0.368$ ,  $p = 0.000$ ). This means that availability of water increases attitude of students toward quality of toilets.

Therefore, effective sanitation and hygiene, better quality of toilets and adequate supply of water positively affects self-esteem of female students. This finding is supported by that of Park et al. (2016) in Korea that self-

esteem is positively associated with satisfaction with school life which includes availability of water, proper sanitation and favourable hygiene. Therefore, self-esteem of female students should be enhanced by establishment of effective sanitation and hygiene, ensuring good quality of toilets and maximizing supply of water in schools under investigation.

## Conclusions

Five conclusions emanated from findings of the study regarding school water, sanitation and hygiene as well as students' self-esteem among secondary schools in Monduli District:

1. Amount of water supply in schools is adequate and constant though water taps for hand washing were nonexistent.
2. Some of school toilets do not have doors and locks. They are not clean and neat, they are not safe and comfortable, there are no disposal bins in toilets for disposing used menstrual pads and there is limited access to soaps in toilets for hand washing.
3. Students had positive attitude toward sanitation and hygiene condition at their schools. They agreed that there are shops near school compounds which sell sanitary pads, schools have places for burning menstrual used pads, school environments are clean and neat, and school compounds have bins for disposal of waste materials.
4. Students considered themselves to be self-esteemed. They agreed that their fellow students treat them as useful members in the learning process, they feel respected by people who surround them, they are creative in academic and personal duties and they are self-confident about their academic performance.
5. There is a significant positive relationship between

self-esteem, and sanitation and hygiene, quality of toilets and availability of water. Therefore, effective sanitation and hygiene, better quality of toilets and adequate supply of water positively influence self-esteem of female students. There is a significant positive relationship between sanitation and hygiene and two factors namely availability of water and quality of toilets. Therefore, availability of water and quality of toilets positively affect sanitation and hygiene.

## Recommendations

The following recommendations emanated from conclusions of the study regarding the influence of school water and sanitation:

1. There is need for schools under investigation to fix water taps for hand washing. This will enhance sanitation and hygiene condition and therefore improve health of female students.
2. There is need for schools under investigation to fix doors and locks in school toilets for privacy and safety, disposal bins for used menstrual pads in the toilets as well as soaps and sanitation facilities for effective hand washing.
3. Teachers should take advantage of female students' self-esteem as means to enhance academic performance. This can be realized when teachers spend their time to give necessary support that is needed for each student to maximize their potential and consequently improve academic performance.
4. Since students' self-esteem positively correlates with sanitation and hygiene as well as with quality of toilets and availability of water, there is need to improve sanitation and hygiene, quality of toilets and availability of water to maximized self-esteem of students.

## CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

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