



Journal of Arts & Humanities

Volume 08, Issue 01, 2019: 56-67

Article Received: 30-12-2018

Accepted: 08-01-2019

Available Online: 25-01-2019

ISSN: 2167-9045 (Print), 2167-9053 (Online)

DOI: <http://dx.doi.org/10.18533/journal.v8i1.1563>

Access to Improved Sanitation Facilities and Female School Attendance: A study of Savelugu Municipality of Ghana

Bismark K. Anyarayer¹, Amin Alhassan², Amadu M. Faisal³

ABSTRACT

The study investigates the extent to which access to adequate and improved sanitation influence school attendance of female students in public senior high schools in the Savelugu municipality of Ghana. A cross sectional survey design using both qualitative and quantitative methods was used to collect data in Savelugu Senior High School and Pong-Tamale Senior High School, all in the Savelugu Municipality. A total of 345 female students and two headmasters and six assistant headmasters from the two senior high schools were interviewed. The data was analyzed using descriptive and inferential statistics of Analysis of Variance (ANOVA). The study established that the availability of improved and adequate sanitation facilities was significant in determining the extent of use, and school attendance of females in such schools. The study established that lack of privacy and insecurity caused by substandard sanitation facilities contributed to female student absenteeism. The study further revealed that the availability of improved sanitation facilities could account for 38.3% percent of the change in the level of sanitation use and its impact on female school attendance. We recommend that school management teams should ensure adequate provision of improved sanitation facilities in every public senior high school as part of efforts to improve female students school attendance.

Keywords: Sanitation, Female School Attendance, Open Defecation, Savelugu Municipality, Ghana.

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1. Introduction

The world body, the United Nations, has committed to ending open defecation and achieving access to 'safely managed' sanitation for all by 2030 as part of the Sustainable Development Goals (SDGs). As part of meeting this commitment emphasis has been placed on paying special attention to the needs of women and girls. But progress towards achieving the goal has been slow as almost one in three females do not have decent toilets of their own (Water Aid, 2017). According to Water Aid (2017),

¹ Faculty of Agribusiness and Communication Sciences, University for Development Studies, Tamale, Ghana.

² Corresponding author, Faculty of Agribusiness and Communication Sciences, University for Development Studies, Tamale, Ghana. E-mail: hassanamin@uds.edu.gh

³ Faculty of Agribusiness and Communication Sciences, University for Development Studies, Tamale, Ghana.

girls who do not have access to decent toilets at school or near home have to defecate in the open or use unsafe, unhygienic toilets, often shared with boys. Aside from the health risks, this is uncomfortable, embarrassing and puts them at risk of verbal and even physical abuse. To avoid this experience, they will often avoid eating and drinking during the day, making it hard to concentrate at school. Once they attain puberty, girls are more likely to miss classes or drop out of school where there are no decent toilets and changing rooms at school.

The impact of lack of standard sanitation facilities tend to affect poor people the most due to their economic vulnerability. This in turn affect their prospect for good health and ability to have good education. Poor sanitation contributes in creating a poverty loop that makes it difficult for the poor to take advantage of self-improving opportunities such as schooling. When the gender dimension is factored, females tend to be more affected. According to Water Aid (2017) in sub-Saharan Africa, one in ten girls miss school during their period. This in no measure will adversely impede the attainments of the Sustainable Development Goals 3, 4, 5 and 6. Goal 3 espouses the need for good health and well-being where member countries are to ensure healthy lives and promote well-being for all at all ages. In goal 4, member states are admonished to ensure inclusive and equitable quality education and to promote lifelong learning opportunities for all whereas goal 5 envisages the attainment of gender equality and the empowerment of all women and girls. For goal 6, the issues of clean water and sanitation are prioritized. Member states subscribed to ensure availability and sustainable management of water and sanitation for all by 2030.

Conventional sanitation, a flush toilet connected to a centralized sewer system, is available for only a small fraction of people in developing nations. Forty percent of the world's population use unsafe toilets or practice open defecation. The consequences of unsafe sanitation can be devastating and last a lifetime. Every year, food and water tainted with fecal matter cause up to 2.5 billion cases of diarrhea among children under five, resulting in 1.5 million child deaths (USAID, 2018).

There are inadequate toilet facilities in public secondary schools across Africa; in most cases these few toilet facilities have no running water for hand washing. However, the recommended practice is that water should be kept beside toilets to make it convenient and therefore motivate students to wash their hands after visiting the facility. Female students feel particularly uncomfortable when there is no privacy from their colleagues during urination and menstrual management. This poses a challenge to female students in relation to hygiene practices and affects their class attendance. Female students prefer to stay in their dormitories during such periods instead of attending classes.

Despite these linkages between quality of available sanitation facilities and female hygiene, some studies have claimed that there is no conclusive evidence of the relations between the provision of improved sanitation facilities and school attendance. Birdthistle et.al (2011), in a systematic review of available literature could not support a claim that provision of separate toilet facilities leads to increased female school enrolment and attendance. However, a subsequent study by Willmott et.al. 2015 was able to establish the linkage of improved sanitation and school attendance when they factored in health and hygiene. They found out that water treatment and hygiene promotion intervention reduced school absenteeism significantly to about 36%. When sanitation was factored, the gender dimension became evident with a clear difference on level of school absenteeism between males and females. The level of absenteeism among girls rose to 58% with no effect on the rate of absenteeism among boys (Mills and Cumming 2016).

Freeman et.al (2013) work is persuasive in showing evidence that poor sanitation at schools affect female the most as they tend to absent themselves from school due to water related and sanitation related infections. In Addition, Adukia's (2013) study using annual school level data from India, and Mason et.al (2015) study in Kenya all point to the fact that improved sanitation facilities as high school level tremendously improve female school attendance and absence of impaired concentration. A general examination of the relationship between the provision of improved sanitation facilities at schools, at the first instance, do not provide us with the evidence of impact on reducing school absenteeism. However, then the data is disaggregated on gender and age, the specificity of adolescent girls' need become evident. This then underscores the need for a focused study of impact of the provision of improved sanitation at high school level.

In Ghana studies show that many senior high schools in the country lack adequate hygiene facilities, and where there are few toilet facilities, they are in deplorable state. It is uncommon to find

separate sanitation facilities for boys and girls. Where separate toilets are provided, their filthy conditions make them unusable. In some cases, the condition of these toilets is so unkempt that female students find it unusable and rather prefer indulging in open defecation (Anyarayer, 2017). In some instances, female students could not use toilets because they were in a horrifying state. Some of the toilets had no doors to provide privacy while the remaining ones had badly rusted corrugated iron sheets and broken doors thus passersby could see into the toilets.

2. Problem statement

Girls in developing countries disproportionately drop out of school, particularly around puberty. Addressing gender biases in educational attainment is central to reducing gender inequality, as education provides opportunities for upward economic mobility. Gender equality in education and economic opportunity has also been associated with a broad range of social and economic benefits (Duo, 2012).

The Sustainable Development Goals (SDGs) identified eight priority areas for improving the lives of the world's poorest people, which included the elimination of gender disparity in education (UN, 2017). There was a particular focus on educating pubescent-age girls, who experience the highest school dropout rates. These issues are of tremendous concern to policy-makers because of the sense that childhood access to education shapes adults' economic and social lives.

The sampled study schools have a total female population of 1537, with 787 for Savelugu Senior High and 750 for Pong-Tamale SHSs. The available toilet facilities for these schools are highly inadequate. Savelugu SHS for example, has only one six-seater shared toilet facility for both male and female students. Pong-Tamale SHS, on the other hand has two toilet facilities with a combined seater capacity of eight for the entire student body. Female students suffer some devastating consequences as a result of this condition in the various senior high schools in the Savelugu municipality. Whilst this study acknowledges that several factors could explain low school/ class attendance by female students, it hypothesized that the state and adequacy of sanitation facilities of a school is a significant factor affecting school attendance of females in senior high schools in the Savelugu Municipality. If students are to make the most of their educational opportunities, it is crucially important that they enjoy adequate sanitation facilities to guarantee safety, privacy and healthy female student population.

Poor health is an important underlying factor for low school enrollment, absenteeism, poor classroom attendance and early school dropout. The lack of, and poor state of the few available sanitation facilities in these schools are presumed to be some of the factors that affect female students' school attendance.

This study seeks to establish in detail the relationship between access to adequate and improve sanitation and school attendance of female students in Savelugu and Pong-Tamale Senior High Schools with a view to come up with strategies that can be used by stakeholders and policy makers to initiate practical and affordable methods that enhances the sanitation situation and hygiene practices in public senior high schools in Savelugu municipality.

3. Research questions

The study sought to answer the following research questions:

- i. To what extent does the type and state of sanitation facilities influence school attendance of female students in public senior high schools in Savelugu municipality?
- ii. How does the number of improved sanitation facilities influence school attendance of female students in public senior high schools in Savelugu municipality?

4. Literature review

Since 2000, the world has made huge progress in reducing the number of people living in poverty, but the success of the UN Sustainable Development Goals (SDGs), to eradicate extreme poverty and create a fairer, healthier, more sustainable world, will be limited while hundreds of millions of people lack a decent toilet and the potential of women and girls is held back. The state of the World's Toilet 2017 explores how the lack of decent and adequate toilets around the world prevents women and girls from fulfilling their potentials. UNICEF and WHO (2017) Joint Monitoring Programme

report, identified countries where women are struggling most to access toilet facilities, and recommend that decent toilets be made available for everyone by 2030.

Kofi Annan, the then UN Secretary-General, in 2003 stated that the tool for development cannot be more effective without the education of female students. No other policy can stimulate economic productivity, lower infant and maternal mortality, improve nutrition and promote health (as cited in UNICEF, 2008). Other fundamental benefits associated with girls' education encapsulate protection against early pregnancy and other sexual/reproductive harms including HIV/AIDS (Mason et al., 2013). Girls in countries in the global south bear a disproportionately high burden of such harms and although girls' school enrolment ratios in the region have appreciated tremendously in recent years (World Bank, 2011), enormous inequality gaps in primary education remain a disturbing issue in the educational sector of these countries (UN, 2017). Gender gaps are even more acute in secondary education (Mensch and Lloyd, 1998; Mutunga and Stewart, 2003; Muito, 2004; Kirk and Sommer, 2006; Sommer, 2010; Malusu and Zani, 2014).

To explain these gaps, attention has been drawn to possible linkages between poor school-based sanitation and girls' low attendance rates and academic performance. At the same time, the interdependence of the gender, education and sanitation in the SDGs 3, 4, 5 and 6, has received momentous interest from governments, donor nations and NGOs. Earlier study by Barbara Frost (as cited in Melik, 2011) affirm this assertion made in the SDGs who espoused that without sanitation, universal primary education, gender equality and empowerment of women, and a reduced child mortality cannot be achieved.

With regard to the impact of sanitary product access on school attendance of female students, Scott et al. (2009) found that the provision of sanitary towels coupled with menstrual hygiene education in Ghana reduced girls' absence from school by more than half. In the ranking of top countries with most people without decent sanitation facilities has Ethiopia as the worst country and Ghana as the ninth ranked country. The report of Water Aid espoused that more than 46 million women and girls have no access to toilets (Water Aid, 2017).

The lack of sanitation facilities in public senior high schools (SHSs) has the potential of affecting the school attendance of female students due to increased absenteeism from school. In this context therefore, it can be deduced that academic performance would be negatively affected. The Northern region as a whole and Savelugu Municipality in particular have consistently lagged behind the rest of the country when it comes to academic performance at the West African Senior School Certificate Examinations scores nationally (Ziem 2015).

5. Research methodology

The Savelugu Municipality has only two regular public senior high schools. A third one is for special needs student who are blind. All three schools are boarding facilities. Thus, purposive sampling strategy was used to select the two regular senior high schools and the target female population. Data was collected from a sample of 354 female students who were selected using the lottery methods of the simple random sampling technique from a total female population of 1,537 in the two-mixed public senior high schools from the Savelugu Municipality. The study considered female students of two out of the three levels study grades in the sampled senior high schools; form one and form two female students. The form two and one students were selected because they were the batches of students left on the various campuses during the data collection period since the form threes had finished their final examinations and left the campuses.

The study used a mixture of qualitative–quantitative research approach with non-participant observation, interview guide, and questionnaire administration as main tools for data collection. The questionnaires were subjected to a pilot test for the purpose of ensuring its reliability and validity of results before the researcher undertook the collection of the data. Split-half method was used to determine the reliability of the instrument. Different instruments were combined for purposes of triangulation (Hesse-Biber, 2010; Leedy & Ormrod, 2005) to verify the extent at which the adequacy of improved sanitation facilities influences school attendance of female students in the municipality.

Data was analyzed using descriptive statistics for quantitative data. Measures of central tendency which comprises the mean, the mode and the median show how quantitative data obtained from respondents or from the study tends to cluster towards a certain center. In social sciences,

measures of central tendency are used to give expected summary statistics of variables being studied (Mugenda and Mugenda 2003). Content analysis was used for qualitative data.

The hypotheses were tested using ANOVA since the study was comparing availability of adequate and improved sanitation facilities as against its impact on school attendance of female students in the two-selected senior high schools. Multi-linear regression model was then used to analyze the degree of relationship between the dependent variables and school attendance of female students as the independent variable. Multiple linear regression was also used to find out whether availability of toilets impacts on school attendance at a significant level of 0.05.

6. Findings of the study and discussions

The condition of learners' sanitation facilities reflects the image of a school and has an influence on their health, school attendance and to a varied extent, academic performance. It is in view of this that the study was carried out to gather information from respondents regarding the influence the type and state of school sanitation facilities have on school attendance of female students in senior high schools in the Savelugu Municipality.

To what extent does the type of sanitation facility and sanitation practices influence school attendance of female students in public senior high schools in Savelugu Municipality?

Respondents were asked to indicate the type of sanitation facilities and sanitation practices they use at school. The findings from the students and principals are summarized in Tables 1 and 2 respectively.

Table 1: Students' response on type of sanitation facilities and practices

Response	Frequency	Percentage
Pit-Latrines	60	17.4
Water closet	00	00
Open defecation	285	82.6
Total	345	100

From the findings in Table 1, 60 (17.4%) of the students who formed the sample of the study indicated that they use pit latrines, while 285 (82.6%) practiced open defecation.

Table 2: School administrators' response on type of sanitation facilities and practices available to female students in their respective schools

Response	Frequency	Percentage (%)
Flush toilets	0	00.0
Pit latrines	3	33.3
Open defecation	5	66.7
Total	8	100.0

The results of the findings presented in Table 2 indicate that just like the students, majority-five (66.7%) of school administrators revealed that students use open defecation in most cases. Only 33.3% indicated use of pit latrines by their students. The zero percentage in the use of flush toilets in the area under study may be due to the fact that the only available flush toilet facility is broken and not functioning. It is important to note that the area where the study is conducted has perineal acute water problems, an indication of inadequacy of water for water closet systems. Pit latrines and mostly open defecation are therefore the default options available.

Is there any relationship between adequacy of sanitation facilities and school attendance of female students in public senior high schools in Savelugu Municipality?

A six-point Likert scale ranging from "strongly agree" to "strongly disagree" in which respondents were further asked to indicate their level of agreement concerning the adequacy of sanitation facilities that were available for use and its impact on school attendance. Table 3 gives a summary of the study findings.

Table 3: Adequacy of sanitation facilities used by students and school attendance

Response	Frequency	Percentage (%)
Strongly agree	132	38.3
Agree	97	28.1
Neutral	31	9.0
Disagree	32	9.3
Strongly disagree	49	14.2
No response	4	1.2
Total	345	100.0

The findings in Table 4 indicates that 132 (38.3%) of the students involved in the study **strongly agree** that adequate sanitation facilities have an influence on school attendance, while 97 (28.1%) **agree** to this statement, however 49 (14.2%) of the respondents **strongly disagree** to the statement and indicated that the adequacy and improved student toilets facilities has no significant influence on their school attendance.

All the eight school administrators supported the students view since they also revealed that toilets which were being used by students were inadequate and it does affect female students' attendance negatively. This means that public senior high schools in Savelugu municipality have to provide adequate sanitation facilities for use by their female students to help improve their school attendance.

Does the frequency of maintenance of sanitation facilities influence improved sanitation practices?

Table 4: Administrators' response on maintenance of school sanitation facilities

Response	Frequency	Percentage %
When repair is required	2	7.1
Once a year	1	3.6
Once a year/when need arises	2	7.1
When conditions deteriorate	5	82.1
Total	8	100

All the eight school administrators (100%) in the schools under study reported some degree of maintenance of sanitation facilities in their respective schools, with the majority (82.1%) revealing that broken-down toilets facilities were fixed occasionally. This is a clear indication that most of the toilets were in bad condition and therefore compelled students to engage in open defecation which affect their privacy and security.

Sanitation facilities and the state of maintenance

Responses were also sought on how often the toilets are cleaned and disinfected. A Likert scale ranging from "strongly agree" to "strongly disagree" was used where the respondents were asked to indicate their level of agreement regarding the extent to which this hygiene practice was carried out. Table 5 contains a summary of the data obtained from students while Table 6 has findings collected from the school administrators.

Table 5: Students' response on extent of regular cleaning and disinfection of sanitation facilities in schools

Response	Frequency	Percentage (%)
Strongly agree	50	14.5
Agree	40	11.6
Neutral	60	17.4
Disagree	80	23.2
Strongly disagree	115	33.3
Total	345	100

From the findings in Table 5, 115 out of 345 of the respondents, representing 33.3% of the sampled students **strongly disagree** to the statement and revealed that they do not embark on regular cleaning and disinfection of sanitation facilities. This in great measure has discouraged the female students from using the toilets thereby resulting to open defecation. Respondents will therefore wait and attend to toilet in the evening when darkness set in while 50 (14.5%) **strongly agree** and indicates that toilets in the schools under study were regularly cleaned and disinfected.

Table 6: Administrators' response on the extent of regular cleaning and disinfection of sanitation facilities

Response	Frequency	Percentage (%)
Once a week	5	62.5
Twice a week	-	-
Once a day	3	37.5
Twice a day	-	-
Total	8	100.0

The responses in Table 6 show that the school administrators had similar observations to those of the students regarding cleanliness and disinfection of sanitation facilities with 62.5% of them revealing that students' sanitation facilities in their schools were cleaned and disinfected once a week while the remaining 37.5 percent indicates that cleaning and disinfection was carried out once a day. There is a clear indication that majority of the respondents revealed that a significant level of the few sanitation facilities are not regularly cleaned and disinfected in the schools under study, a practice which may discourage female students to use the toilets because of their bad and unhygienic state.

The following study hypothesis was tested by use of ANOVA.

Hypothesis H₀₁: There is no significant relationship between adequate provision of sanitation facilities and school attendance of female students in public Senior High Schools in Savelugu municipality.

This hypothesis investigates the extent to which adequacy of sanitation facilities, the type of toilet, privacy and security of use, influence school attendance of female students in public senior high schools. The study computed the one-way analysis of variance (ANOVA) so as to pass judgment on the null hypothesis which stated that, there is no significant relationship between adequate provision of sanitation facilities and school attendance of female students in public secondary high schools in Savelugu municipality. The results of ANOVA are summarized in Table 7.

Table 7: Influence of adequate sanitation facilities on school attendance of female students

INDICATORS	ANOVA	Sum of squares	Df	Mean squares	F	Significance
Adequate provision of sanitation facilities subject to female students' usage	Between groups	167.74	4	45.537	28.436	.000a
	Within groups	598.318	446	1.661		
	Total	766.060	450			
Influence of proper and sustained use of toilets subject to female school attendance	Between groups	390.325	5	79.341	49.741	.000a
	Within groups	519.601	444	1.526		
	Total	909.926	449			

The results in Table 7 show that, adequate provision of sanitation facilities by school authorities significantly influence its use by female students. The influence is significant as stipulated by the results of $F(4,446) = 28.436, P < 0.05$. This implies that availability of sanitation facilities would cause significant influence of use by female students in public senior high schools. The result of the influence of proper and sustain use of toilets facilities on school attendance of female students was $F(5, 444) = 49.741, P < 0.05$ indicating significant influence. Since the F was significant, the researchers therefore rejected the null hypothesis which stated that "there is no significant relationship between adequate provision of sanitation facilities and school attendance of female students in public senior high schools" and

accepted the alternative. It can therefore be assumed that when female students are convinced that avoiding open defecation practices can immensely aid in preventing sanitation related diseases like diarrhea, typhoid, cholera, they will sustain the use of the toilet facilities. In addition to the impact on health and dignity, adequate sanitation facilities provide adequate security from snake bites in the bushes, attacks and harassment from their male counterparts, give enough privacy and save their study time.

A Water Aid survey (2017) agrees with these research findings which revealed that one in every five women in Lagos had experienced verbal harassment and intimidation or had been physically threatened or assaulted when going to the toilet. Anecdotal evidence from communities suggests the true scale of the problem may be much larger. Female students could possibly use their time efficiently on their books and attend classes regularly instead of wasting the same time attending hospital in the quest of getting treatment for such avoidable and preventable diseases. It could also ensure that they use the available toilets in the best hygienic manner possible since the toilets are adequate.

Regression prediction models were developed and used for the estimation of the frequency of school attendance of female students based on adequate provision of sanitation facilities as well as proper and sustained use of such facilities in public senior high schools. The findings of the regression are summarized in Tables 8 and 9 respectively.

Table 8: Regression model for adequate provision of sanitation facilities, subject to female students' use

8a.

Model summary	R	R square	Adjusted R square	Std. Error of the estimate
	.434 (a)	.178	.199	1.295

8b.

ANOVA	Sum of squares	Df	Mean of square	F	Significance
Regression	216.264	4	45.544	28.436	.000(a)
Residual	678.813	446	1.761		
Total	895.077	450			

8c.

Coefficients	Unstandardized		Standardized	T	Significance
	Coefficient B	Standard Error	Coefficient Beta		
(Constant)	1.143	.37		2.301	.020
Privacy & security	.120	.427	.111	.120	.022
Type of toilet	.177	.183	.055	.869	.018
Adequacy	.186	.121	.167	2.372	.012

The results indicated in Table 8 illustrate that improved school attendance of female students in the selected senior high schools is positively influenced by type, adequacy and maintenance of sanitation facilities. On the basis of the results obtained, the following regression equation is developed:

$$R_{s4} = 1.143 + 0.111x_1 + 0.055x_2 + 0.167x_3$$

Where:

R_{s4} = composite index for improve school attendance of female students

X₁ = Composite index for privacy and security of female students as a results of toilet use

X₂ = Composite index for type of sanitation facilities in the selected senior high schools

X₃ = Composite index for adequacy of sanitation facilities in public SHSs

The model has an **R** value of **0.434** and an **F** value of **28.436** whose critical value of **P = 0.000**.

The model has an **R²** value of **0.178**, meaning that a percentage change in efforts by a school to improve on adequate provision of toilet facilities will lead to a **17.8%** increase in school attendance of

female students in public senior high schools. The model also indicates that, the most important indicator in determining proper and sustained use of toilet facilities and for that matter ending the menace of open defecation, waste of time and resources is the adequacy of sanitation facilities whose **beta** value is **0.167**. Since adequate sanitation facilities are expected to be provided for use, then, it is worth arguing that, a significant number of the female students will most likely use the sanitation facilities and consequently help in improving school attendance of female students. Adequacy of improved sanitation facilities is then followed by privacy and security of female students as a result of toilet use with a **beta** value of **0.111** and type of toilets whose **beta** value is **0.055** respectively.

Table 9: Regression model for influence of proper and sustain use of sanitation facilities, subject to school attendance of female students in public Senior High Schools

9a.

Model summary	R	R square	Adjusted R square	Std. Error of the estimate
	0.281(a)	0.101	0.102	1.103

9b.

ANOVA	Sum of squares	Df	Mean square	F	Significance
Regression	133.33	4	54.33	28.72	.000(a)
Residual	302.23	224	1.32		
Total	435.56	228			

9c.

Coefficients	Unstandardized		Standardized	T	Significance
	Coefficient B	Standard. Error	Coefficient Beta		
(Constant)	1.110	.190		1.201	.010
Privacy & security	.110	.219	.100	.110	.022
Type of toilet	.141	.112	.044	.241	.012
Adequacy	.216	.101	.130	0.321	.011

The results in Table 9, pointed that maintenance, type and adequacy of sanitation facilities in the two-selected public senior high schools have a positive effect on school attendance of female students. The following regression equation is formulated on the basis of the results obtained in Table 9.

$$Rt_3 = 1.111 + 0.100X_1 + 0.044X_2 + 0.130X_3$$

Where:

Rt₃ = composite index for improved school attendance of female students

X₁ = Composite index for privacy and security of female students as a results of toilet use

X₂ = Composite index for type of sanitation facilities in the selected senior high schools

X₃ = Composite index for adequacy of sanitation facilities in public SHSs

The model has a multiple regression of **r = 0.281** and an **F** value of **28.720** whose critical value is **P = 0.000**. The model indicates that improved school attendance in the selected public senior high schools could be well estimated based on the availability of improved sanitation facilities. The model has an **r²** value of **0.101**, revealing that all the indicators for adequacy and improved toilet facilities could account for **10.1** percent of positive change in school attendance of female students in the two-selected senior high schools in the Savelugu municipality in particular and all public senior high schools in the country in general.

The model in Table 9 indicates that the most significant indicator is the adequacy of sanitation facilities (with a beta value of **0.130**) compared with privacy and security of female students from in and out the toilet facility with beta value **0.100**. As a headmaster in one of the schools emphasized; privacy and safety matter sufficiently for girls at older ages that school sanitation only reduces gender disparities with the construction of sex-specific latrines. The findings of this study is in sync with the

study of Alhassan and Anyarayer (2018, 7) who pointed out that “privacy, safety, dignity and comfort are the hallmark for females students in considering sustained toilet use hence their desire to sustain open defecation free (ODF) status than their male counterparts”.

The types and nature of toilets followed with a beta value of **0.100** and **0.044**. From the model, it can be assumed that respondents are clamoring for adequate and improve sanitation facilities in the schools under study, because the sanitation facilities available are woefully inadequate. The female students therefore scrambling to use the facilities thereby resorting to open defecation which is usually done in the dark as the researcher observed. The adequacy of gender-specific toilets facilities can propel access and sustain use by female students, unproductive time used in roaming around looking for a nice place of convenience will be converted to productive use on their books.

7. Conclusions and recommendations

This study found out that type, adequacy of sanitation facilities as well as privacy and security of the female students make significant impact on female school attendance, although adequacy and improved sanitation facilities had the greatest contribution. The sanitation situation in the studied senior high schools is in contrast to the expectations of the respondents, where there are very few toilets facilities with most of them in poor state. The nature and number of toilets on the grounds affirms a study which was carried out in two schools in Zimbabwe where Sommer (2011) pointed out that the toilets used by the students are deplorable to provide privacy and security of use and therefore affect students negatively especially the female students when they had their menstruation. Similar studies conducted by Siwolo (2004), Asyago (2005) and Mugo (2006) found out that most of the sanitation facilities in schools were not adequate to meet female students needs and were not properly maintained.

From the findings, it emerged that toilets have a positive significant influence on school attendance of female students in public senior high schools in the Savelugu municipality. However, adequacy of toilets is the most important indicator followed by privacy and security of use of these facilities and the type of sanitation facilities available in the schools. School management should try and improve on maintenance culture, provision of modern toilet facilities and increased sanitation facilities in their schools as well as giving more emphasis to the adequacy of the sanitation facilities. This will ensure that all the students access sanitation facilities without hindrance. Further, water should also be located in these facilities, so that the students are in position to wash their hands after visiting the sanitation facilities.

In relating this findings to wider critical discussions, it is important to understand that females have specific needs when it comes to water and sanitation issues. Unmet water and sanitation needs compound the fact that patriarchal systems have a way of negatively positioning women. With deeply held traditional notions of purity and menstruation, (Sweetman and Medland 2017) female students get to suffer doubly and are required to compete with their male counterparts in the classroom. The provision of adequate sanitation facilities in mixed boarding senior high schools is not yet considered a major issue in educational policy as interviews with school authorities showed. Yet, the evidence that female students are disproportionately affected point to a serious policy blind spot in enhancing female education in Ghana. The task then is to position the issue of adequate sanitation at schools as a gendered policy issue in order to mobilize attention on the issue. One possible way of building national attention is to put the issue on the national news agenda to compel the government to add standardized sanitation facilities to its infrastructural investments in public schools.

Discussions about school absenteeism should focus on critical issues such as the nature of the environment on school campuses, the quality of the facilities, and how friendly they are to students with special needs. While this limited study may not warrant a national level recommendation, the situation of poor sanitation facilities at two government-owned public-sector senior high schools is not exclusive to Savelugu Municipality. The situation at Savelugu is easily observable in other rural districts across the country. This study sought to establish a relationship between availability of appropriate sanitation facilities and its relations to female students' school attendance. The evidence we have gathered allows us to make modest recommendations on the need for the linkage of sanitation facilities to national efforts at enhancing school attendance of female students. We recommend that it should be part of the government policy to consciously make budgetary allocations for the provision of

sanitation facilities at high schools. We also recommend that the Parent Teacher Associations (PTAs) of Senior High Schools in the country put in emergency measures to build emergency modern toilets facilities as a stop gap measure to encourage school attendance.

Ghana requires a national standard on the ratio of student/sanitation facility for all boarding schools. This standard will help guide investments in high schools, especially as the country has committed to facilitating increased female access to education as part of the SDGs. As shown in this study, 1,537 students at both Savelugu Senior High School and Pong-Tamale Senior High School have to contend with a total of 14 seater washroom. This works out to about 110 students to one washroom unit. This is obviously inadequate and the improvement of this ratio has to be stated as a national educational objective to garner attention on the issue as part of efforts to improve female education in rural Ghana in particular.

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