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RESEARCH ARTICLE

EFFECT OF THE PHYSICAL INFRASTRUCTURE SAFETY GUIDELINES ON STUDENTS' SAFETY IN PUBLIC BOARDING SECONDARY SCHOOLS IN KENYA: A STUDY ACROSS SECONDARY SCHOOLS IN HOMA BAY COUNTY

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ABSTRACT

Safety of students in public secondary schools is a matter of concern worldwide. In Kenya, a number of students in public boarding secondary schools suffer from tragedies ranging from death of students during infernos in schools, students falling sick due to food poisoning or poor hygiene, attack of students by the community and porous school gates which enables strangers in the school leading to stealing of school property and attack on the students. In 2008, the Government of Kenya launched Safety and Standards manual in both public schools and private schools. Implementations of these standards were expected to make students secure in these schools. However, from 2009 to 2018, there were a number of reported cases of food poisoning, closure of schools due to community threats, loss of lives of students and properties worth millions of shillings in arson cases, diseases caused due to poor hygiene and many others which go unreported. The objective of this study was to establish the effect of physical infrastructure safety guidelines on students' safety in public boarding secondary schools in Homa Bay County. The study revealed that physical infrastructure safety guidelines had significant effect on students' safety. The study also established that physical infrastructure safety guidelines had strong and positive effect on students' safety. The study recommended that school principals should strive to fully implement these safety guidelines to enhance students' safety in public boarding primary schools in Homa bay County, Kenya. The study is useful to policy makers and stakeholders in the Ministry of Education in developing more strategies to enhance students' safety in public boarding secondary schools in Kenya.

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INTRODUCTION

World over, students take the most of their time in school than they do at home (Durka, 2002). Schools are providers of formal education, an important process that each individual has to undergo in life today. Education therefore should be comprehensive, holistic and not just mere dictation of ideas or offering of formulas to be stored in brains and making skills of answering questions at the end of the course (Durka, 2002). In order to do this, schools where children go to learn need to be Child Friendly Schools, in order to enhance the pupils' access and retention in these schools.

Schooling is the one experience that most children worldwide have in common and the most common means by which societies prepare their young for the future (UNICEF, 2009). Notwithstanding this view, institutions of learning are reported to be experiencing serious cases of insecurity. Safety of persons in any learning institution is fundamental and cannot be separated from the teaching and learning process. No meaningful teaching and learning can take place in an environment that is unsafe and insecure for both learners and staff (Nyakundi, 2012). Keeping students safe is a school's top priority. The United Nations Educational, Scientific and Cultural Organization (1987) affirms that the wellbeing of children in school is the concern of everyone since they spend a significant proportion of their time at school. It is therefore

important to address learner safety in schools. School safety has been defined differently by a number of scholars and organizations. Chukwu (2008) for instance, defined school safety as "an effective structure and organization free from potential and physical harm, absence of violence and presence of nurturing, caring and protective staff." Chemeli, Mwongeli and Barmao (2015), states that safety can only be guaranteed if some form of preparedness exists in the school system. The main objective of every school should be to offer quality education to learners, something that can only be achieved if the school environment is conducive and safe enough for learning.

Prinsloo (2006) on the other hand, defines school safety as one that is free of danger and where there is an absence of possible harm; a place in which non educators, educators and all learners may work, teach and learn without fear of ridicule, intimidation, humiliation or violence. According to Republic of Kenya (2008) and Republic of Kenya (2012) school safety has been defined as measures undertaken by the learners, staff, parents and other stakeholders to either minimize or eliminate risky conditions or threats that may cause accidents, bodily injury as well as emotional and psychological distress. It is the responsibility taken by learners, staff, parents and stakeholders to foster all- round safe living. This definition was also reiterated by UNICEF (2010). Bastidas (2011) indicates that safety is a worldwide concern; hence there is a need for a Global platform to discuss ways of providing safety in schools and communities. Safety in schools is a factor that has seen a number of countries, develop strategies and policies to promote and ensure student safety in their countries. The United States Department of Education (2004), for instance, indicates that school wide policies are implemented to systematically address needs of students, school personnel, community and physical plants of the school. The therefore requires safety policies in schools to be strictly enforced in view of threats posed by terrorism, drug related violence and natural disaster.

East Asia and Pacific in collaboration with UNICEF developed a tool meant to assess implementation of child friendly schools. C.F.S demonstrate their concern about the 'whole' child and his/her rights by providing learning environments that are healthy, psychologically supportive, as well as safe and protective of children, especially for those children who are prone to abuse or in need of special protection, (UNICEF, 2006). School safety policies stipulates what action should be taken in order to improve the overall safety and protection of school children, with emphasis on those from diverse backgrounds and abilities (Republic of Kenya, 2012). As a matter of concern, Article 53(1) of the Kenya Constitution (2010) safeguards the right of all children against abuse, neglect, harmful cultural practices, all forms of violence, inhuman treatment and punishment, and hazardous or exploitative labor. This protection has been supported in Part II of the Children's Act No.8 (2001) and Section 4 of the Teachers Service Commission (Teachers Service Commission) Act, 2012. In line with the said regulations, the Ministry of Education Science and Technology, developed a guide to be implemented by public schools in Kenya in order to safeguard and protect the learners: The Safety Standards Manual for Schools in Kenya was published and put in use in 2008. Republic of Kenya (2008) indicates in Chapter 6 that the Safety and Standards Manual is a document that the school should use to maintain a safe, secure and caring environment that foster teaching and learning and incorporates the following key

components: Safety on School Grounds; Safety in Physical Infrastructure; Health and Hygiene safety; Safety in School Environment; Food Safety; Safety Against Drug and Substance Abuse; Safe Teaching and Learning Environment; Social-Cultural Environment of the School; Safety of Children with Special Needs/Disabilities; Safety Against Child Abuse; Transport Safety; Disaster Risk Reduction and School Community Relations. Despite the policies that have been developed by different countries on school safety, media reports have shown that insecurity still exists among the school students internationally, continentally, regionally and even locally. As a result, a number of studies have been conducted in line with safety policies. School physical infrastructure refers to structures such as classrooms, offices, toilets, dormitories, libraries, laboratories, kitchen, water tanks, playground equipment, among others (Republic of Kenya, 2008). The implementation of these physical infrastructures was expected to improve the security of students in schools. Not many studies have been conducted on implementation of physical infrastructure by a number of scholars except for a few. For instance, Ugwalashi (2017) sought to establish the appropriate strategies for school safety management in River State, Nigeria and recommended provision and maintenance of existing facilities, school inspection audits, adequate funding, and training of school administrators, managers and personal among others. The study therefore established that the implementation of infrastructures was inadequate. Being a descriptive study, it did not give the extent to which the status of implementation had impacted on the status of students' security.

Another study was also conducted in Kenya by Gatau (2015) on the safety status of physical infrastructure in public secondary schools in Nairobi West. The study established that most schools had not implemented Ministry of Education safety guidelines in public secondary schools in Nairobi West. The study used a sample size of 15 schools out of a population of 25 schools representing 60% for this study which was appropriate. The findings that the physical infrastructure safety guidelines had not been fully implemented meant that there was a possibility of students being insecure in these schools. The method of analysis was appropriate for the study. The study, however, did not look at the effect of physical infrastructure safety guidelines on students' security in public boarding secondary schools. Moreover, the sample size used in the current study was 31 out of a population of 34 which represented 91.1% which was high. Such a study, has not however been done in Homa Bay County where the current study was conducted. The current study sought to establish effect of physical infrastructure safety guidelines on students' security in public boarding secondary schools in Homa Bay County, the knowledge gap this study sought to bridge.

SYNTHESIS OF LITERATURE ON EFFECT OF PHYSICAL INFRASTRUCTURE SAFETY GUIDELINES ON STUDENTS' SAFETY:

School safety is an important aspect in the provision of quality education. According to Xaba (2006), a safe school is characterized by the presence of certain physical aspects such as a secure wall, fencing and gates, buildings that are in a good state of repair and well-maintained school grounds. Included in these indicators of school safety are: good discipline, a culture conducive to teaching and learning, professional teacher conduct, good governance and management practices, and an absence or low level of crime and violence.

The existence of policy guidelines on school safety has not stopped the incidences of injury, death and loss of property in Kenyan Public Boarding Secondary Schools. Most schools were found not to have complied with safety policies. The schools were ordered to remove grills from dormitory windows to protect students during disasters. It was recommended that school managers should beef up security by employing an adequate number of watchmen (Onyango, 2013). A number of studies have been done with respect to implementation of safety standards in public schools all over the world. According to Republic of Kenya (2008), physical infrastructure include structures such as classrooms, offices, toilets, dormitories, libraries, laboratories, kitchen, water tanks, playground equipment, among others. The safety measure expected that the school should ensure classrooms, dormitories, offices, kitchens, toilets, and other physical structures are clean, well maintained, safe and properly utilized. Ugwalashi (2017) carried out a study on educational facilities: appropriate strategy for school safety management in River State, Nigeria and recommended provision and maintenance of existing facilities, school inspections and audits, adequate funding, training of school administrators, managers and personnel among others. This study made it clear that there was indeed a problem in implementation of physical facilities but did not tell the extent of implementation and its effect on students' security in public boarding secondary schools which this study sought to do in Homa bay County, Kenya. In a study by Ongori (2014) on school based factors influencing the implementation of fire safety standards in Public Secondary Schools in Kenyena District, Kisii County, it was established that school financial resources, training of school stakeholders, frequency of school fire safety assessment by the Quality Assurance and Standards Officers and school fire safety planning influence the implementation of fire safety standards. The study looked at 25 schools with 20 schools being day schools meaning only 5 were boarding schools. Whereas this study was based on school based factors influencing the implementation of safety standards, the major focus was on fire safety standards which is just but a section of physical infrastructure safety policy and left other aspects which the current study focused on. Moreover, the use of only 5 boarding schools may not give the actual picture of the level of implementation of safety standards in Public Boarding Secondary Schools.

Gatau (2015) sought to assess the safety status of physical infrastructure (classrooms, dormitories, sanitation facilities, laboratories and kitchen) in public secondary schools in Nairobi West Region, Kenya and established that most schools had not fully implemented Ministry of Education Safety guidelines to ensure safety of physical infrastructure. This was evidenced by presence of unsafe, squeezed, ill equipped and poorly maintained physical infrastructure. Majority of respondents lacked adequate knowledge on safety standards manual for schools and had not received adequate training on safety disaster preparedness. Finally, the study established that there was no adequate time, material, human and financial resources to enhance safety of physical infrastructure in the school under study. However, this study did not establish the effect of the level of implementation of safety policy on students' security which the current study sought to establish in public boarding secondary schools in Homa Bay County. Musyoka (2013) also carried out another study on influence of provision of school physical infrastructure on students' performance in Kenya Certificate of Secondary Education in Mwingi Central District, Kenya and established that schools do

not have adequate physical facilities which negatively impacted on their academic performance. The study proposed that parents should be sensitized to engage in programs that are geared towards improving the schools' physical facilities in order to improve the learning environment for academic excellence of their children. In another study, Mokaya (2013) sought to establish the influence of the school infrastructure on students' performance in Public Secondary Schools in Kajiado County, Kenya and found out that improved academic achievement is associated with more adequate and well-spaced classrooms, adequate and ample spacing in the libraries, adequate science laboratories, adequate water and sanitation facilities and adequate participation in co – curricular activities. These findings concur with the findings of Musyoka (2013) above. However, the two studies of Mokaya (2013) and Musyoka (2013) majorly focused on a relationship that existed between physical infrastructure and performance which was found to be positive. It was not clear whether there would be a relationship that exists between physical infrastructure safety policy and students' security in Public Boarding Secondary Schools in Homa Bay County, Kenya, which the current study sought to establish.

In another study by Maritim, King'oo and Barmao (2015) on physical infrastructural safeness in Public Secondary Schools in Kenya it was revealed that most schools were not adequately prepared for emergencies both in terms of planning and equipment. It further revealed that only 33.3% of the teachers had been trained on firefighting while 33.8% had safety policy in their schools. An indicator that safety policies were not implemented in these schools. This study was supported by Kisurilia, Katiambo, and Lutomia (2013) in their study on "An investigation into the state of disaster and safety preparedness in schools in Kenya" who established that the learning institutions were not sufficiently prepared to handle disasters and emergency situations. The major strength of this study was that it was carried out in 14 counties to reflect the face of the country. However, the two studies did not reveal the effect of school safety policy on students' security, the knowledge gap that the current study sought to fill in public boarding secondary schools in Homa Bay County. Nderitu (2009) sought to investigate disaster preparedness in public secondary schools in Githunguri Division, Kiambu District. The major findings of the study were; the Ministry of Education safety guidelines had not been adequately implemented in schools. The study established that lack of funds was a major constraint in effective implementation of the safety requirement. The study recommended enhanced school inspection, provision of funds and integration of disaster management in the school curriculum. The study is somehow similar to the current study however the point of departure is that while the study was based on the Wangai policy circular, the current one was based on Safety Standards Manual (Republic of Kenya, 2008). On the other hand, the study was carried in Githunguri Division which is a very small region and cannot be generalized unlike the current study which covered a larger region, Homa Bay County. Nyakundi (2012) in his study of implementation of safety standards and guidelines in public secondary schools in Marani District, Kisii County, established that the Ministry of Education Science and Technology safety standards and guidelines in schools had not been implemented majorly due to inadequate funds and inadequate supervision. The study also recommended that policy makers should follow up, monitor and evaluate safety situations in all educational institutions and provide funds to all schools to enhance disaster preparedness.

Migiro (2012) sought to investigate implementation of the recommended safety standards in public secondary schools in Borabu district, Kenya and established that most public secondary schools in Borabu district were aware of the existing Ministry of Education Science and Technology safety standards, but majority of the schools had not implemented them fully. The study further revealed that the schools that tried to implement the safety standards faced a number of challenges and obstacles key among them lack of funds. The findings were similar to those of Kaari (2014) who sought to investigate institutional factors influencing adherence to safety standard guidelines in Secondary Schools in Buuri District, Kenya and established that majority of principals (81.8%) and Board of Management (88.9%) avail financial resources to cater for safety needs in schools, though funds are usually not adequate. However, in some schools (45.5%), they are allocated with ten to thirty thousand shillings for safety needs that is usually not enough to cater for all safety guideline requirements. The study further established that schools need to beef up security and safety measures to ensure that schools have better learning environment.

A preliminary in 3 schools in Homa county, Kenya revealed that the Ministry of Education funds schools in acquisition of firefighting equipment yet safety policy implementation is a lot more for schools. This means that the schools have funds to enable them finance implementation of firefighting equipment. The study survey revealed that financial constraints and sometimes mismanagement and inadequate community support were major challenges faced in implementation of safety policies. The survey concluded that lack of both financial and human resources failed Quality Assurance and Standards in carrying regular assessments, monitoring and evaluation of implementing safety policies in Boarding Secondary Schools affected students' safety survey. This study majorly focused on challenges and strategies for implementation of safety policies but did not give the actual effect of physical infrastructure safety guidelines on students' safety in Public Boarding Secondary Schools. The current study will focus on both boys and girls boarding secondary schools. The above survey only used a small sample size of only 13 Secondary Schools unlike the current study which will use 3 public Boarding Secondary Schools as sample size. In another study carried out by Mutua (2016), on school-based factors influencing fire safety preparedness in Public Secondary Schools in Lower Yatta Sub County, it was established that most schools had not trained staff and students on fire disaster risk reduction, majority of schools did not have disaster management committees and even those which had, did not involve all the required stakeholders. The firefighting equipments in most schools were not enough contributing to fire safety unpreparedness. In relation to school buildings and fire safety, most schools had made some efforts to improve fire disaster preparedness, although majority of schools had no assembly points. Windows had grills, some doors opened inwards and fire exits were obstructed. This study indicated that there was lack of fire safety preparedness in Lower Yatta Sub County, Kenya. This study however focused on fire safety and did not factor in other physical infrastructure aspects within a school that affect students' safety. The current study will focus on the effect of physical infrastructure safety guidelines on students' security in Public Boarding Secondary Schools in Homa Bay County, Kenya. Even though the studies above identified factors affecting the implementation of physical infrastructure, the studies did not establish the effect of physical infrastructure safety guidelines on students'

security in public boarding secondary schools in Homa Bay County. A gap the current study seeks to address.

Research Objective: The research objective was to establish the effect of the physical infrastructure safety guidelines on students' safety in Public Boarding Secondary Schools.

CONCEPTUAL FRAMEWORK

The Study was guided by Invitational Theory of Practice (Purkey, 1999) which states that People, Places, Policies, Programs and Processes when adequately addressed make schools more safe and appealing. It expected that when these safety guidelines are implemented, then the students would be secure. Therefore, the conceptual framework postulates that when safety guidelines are implemented, the learners are secure. Safety policy manual spelt out that when safety policies are fully implemented, the students were expected to be secure in their schools (Republic of Kenya, 2008).

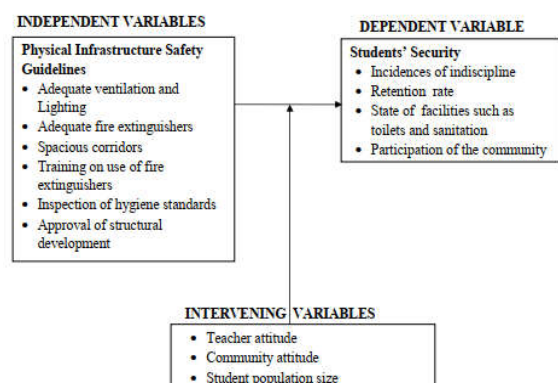


Figure 1. A Conceptual Framework Showing Effect of the physical infrastructure on Students' Safety in Public Boarding Secondary Schools

Implementation of physical infrastructure safety guidelines independent variable is one of the ways by which safety of the students (dependent variables) can be achieved. In the process of doing this, some variables such as teachers' attitude and community attitude and student population size can influence the implementation. Almost all, if not all, of the aspects to be put in place requires a lot of money and can only be implemented when finances are available. On the other hand, the attitude of teacher and the community needs to be positive for the implementation to be successful. The goodwill of the community is needed in order to have these policies implemented, otherwise the principal's efforts may not be supported. Whether or not the stakeholders are trained on safety policies will tell whether the policies would be fully implemented or not. Ongori (2014) established that one of the factor that hindered the implementation of safety policy was lack of training of school stakeholders. According to Lucheli and Masese (2009), the then Kenya Secondary School Heads Association, Cleopas Tirop reported that funding paralyzed efforts by schools to install firefighting equipment. "Most schools have tried to meet the safety requirements, but fire extinguishers are still a challenge." Lucheli and Masese (2009), also indicated that the then Kapsabet Boys Principal said that "After the government stopped funding, schools started single sourcing, but stringent budgets frustrated their efforts".

The students' security therefore would be based on whether or not these safety policies are implemented in public boarding secondary schools. Student population will actually be useful in determining the extent of implementation as observed by Ng'ang'a (2013) whose study findings suggest that the increasing student population was a challenge to achieving successful implementation of safety standards because there was congestion among the students. The findings were also in agreement with Muthuiya (2013) and Chabari (2010) who in their studies had found that free secondary education had allowed more students to pursue secondary education which in turn increased school population ultimately stressing the schools' resources and facilities compromising both the quality of education as well as the safety of the students.

RESEARCH METHODOLOGY

Descriptive and correlational research designs were adopted. Study population consisted of 34 Principals, 8 Sub County Quality Assurance and Standards Officers and 4,800 students. Saturated sampling was used to sample 31 Principals and 8 Sub County Quality Assurance and Standards Officers where as purposive sampling was used to sample 369 students. Researcher's observation schedule/document analysis guide, students' focus group discussions and interviews were used as research instruments. Face and content validity of the instruments was determined by experts in education administration and their advice was incorporated. Reliability of the instruments was determined by administering a test once in 3 schools and computing Cronbach's Alpha, giving a coefficient of 0.935 which was reliable. Quantitative data was analyzed by use of descriptive statistics in form of frequency counts, means and percentages, whereas inferential statistics was used to carry out regression analysis with change statistics to determine whether safety policy had statistically significant effect on students' safety or not and also to show whether there is a relationship or not between different safety guidelines and students' safety.

RESULTS

Demographic Data of Respondents: The respondents involved in the study were: principals, students and the Sub County Quality Assurance and Standards Officers in Homa Bay County. Gender, school population, school type and availability of safety policy manual was sought from the principal. The findings were as shown in Tables 1, 2, 3 and 4.

Table 1. Distribution of Principals by Gender as indicated by Principals (n = 31)

	Frequency	Percentage %
Male	13	41.9
Female	18	58.1
Totals	31	100

From Table 1, the number of female principals was found to be slightly higher, 18 (58.1%), than the number of male principals, 13 (41.9%) in public boarding secondary schools in Homa Bay County. This distribution means that there was no gender parity in distribution among the principals in public boarding secondary schools in Homa Bay County, and therefore matched the two third gender rule as per the Constitution of Kenya.

Table 2. Distribution in School Populations as indicated by Principals (n = 31)

Population range	Frequency	%
Below 500	8	25.8
501-700	4	12.9
701-900	8	25.8
901-1100	1	3.2
1100 and Above	10	32.3
Total	31	100

From Table 2, it can be noted that most of the public boarding secondary schools, 10 (32.3%) had higher population of 1100 and above, while 8 schools representing 25.8% had a population below 500. In the middle were schools with a population of between 501- 700 (4, 12.9%), 701- 900 (8, 25.8%) and only one school with a population between 901-1100 (3.2%).

Table 3. Distribution of School Type as indicated by Principals (n = 31)

School Type	Frequency	%
Boys Boarding	13	41.9
Girls Boarding	18	58.1
Mixed Boarding	0	0
Total	31	100

From Table 3, it can be noted that most of the public boarding secondary schools in Homa Bay County were girls boarding schools 18(58.1%) with only 13(41.9%) being boys boarding schools. It is also clear that amongst the public secondary schools under study, there were no mixed boarding secondary schools. Indeed this was in order because there are some aspects of safety which are unique to gender.

Table 4. Availability of Safety and Standards Manual as indicated by Principals (n = 31)

Availability	Frequency (f)	Percentage (%)
Yes	28	90.3
No	3	9.7
Total	31	100

From Table 4, it can be noted that most of the public boarding secondary schools, 28 (90.3%), had the safety and standards manual while 3 (9.7%) had no safety and standards manual. These findings are contrary to the findings by Chemeli, Mwangeli and Barmao (2015), who found out in their study that only 33.8% of the principals had safety policy manual in their schools. This means that the 28 public boarding secondary schools had better opportunity to implement safety policies since they had a guideline on implementation as per the manual. However, the 3 schools which had no safety manuals would not easily implement the policies since they had no guideline.

Research Objective: Research objective was to determine the effect of effect of the physical infrastructure safety guidelines on students' safety in Public Boarding Secondary Schools. To achieve this objective, observations were made in public boarding secondary schools to establish the status of implementation of physical infrastructure safety guidelines and the status of safety among the students, and the null hypothesis that: Physical infrastructure safety guidelines have no effect on students' security in Public Boarding Secondary Schools in Homa Bay County, was used.

Table 5. Status of Implementation of Physical Infrastructure Safety Guidelines as rated by Principals (n=31)

Aspects of Physical Infrastructure Guidelines	Ratings					Total Scores	MR
	1	2	3	4	5		
Corridors in the School	9	7	6	9	0	77	2.48
Availability and Service of Fire Extinguishers	8	9	10	2	2	74	2.38
Expertise in use of fire extinguishers	0	4	6	8	13	123	3.97
Dormitory register	1	0	19	9	2	105	3.35
Patrol by Security Personnel	1	1	13	10	6	112	3.61
Inspection of hygiene standards in the dormitories and learners	0	0	18	7	6	112	3.61
Beds and Space	0	0	16	8	7	115	3.71
Approval of Physical Structures	1	0	3	16	11	129	4.16
Overall Mean Rating	20	21	91	65	47	830	3.35

KEY: MR: Mean Rating;

Interpretation of Mean Ratings

1.00- 1.44 = Not Accomplished,

1.45 - 2.44 = Less Accomplished,

2.45 - 3.44 = Moderately Accomplished,

3.45 - 4.44 = Partly Accomplished,

4.45 - 5.00 = Fully Accomplished.

Table 6. Status of Students' Safety in relation to Physical Infrastructure Safety Guidelines as rated by Principals (n=31)

Aspects of Students' Safety	Ratings					Total Score	MR
	1	2	3	4	5		
School broken into by strangers stealing students' property due to lack of watchmen;	0	2	0	10	19	139	4.48
Loss of students' properties in dormitory fire due to absence of / inadequate fire extinguishers;	0	0	2	1	28	150	4.84
Loss of life in dormitory fires due to poor evacuation procedures;	0	0	0	0	31	155	5.00
Casualties due to lack of stairway rails;	0	0	0	3	28	152	4.90
Students injured due to lack of ramps/ special pathways;	0	0	1	3	27	150	4.84
Injuries of students due to slippery floors;	0	0	0	4	27	151	4.87
Eye problems to students due to poor lighting in classrooms/ library;	0	0	2	1	28	150	4.84
Loss of life in dormitory fires due to lack of emergency door;	0	0	0	0	31	155	5.00
Destruction of students property due to roof leakages;	0	1	11	14	5	116	3.74
Perimeter wall collapsing on students due to poor workmanship;	0	0	1	2	28	151	4.87
Physical injuries to students as a result of doors opening inwards;	0	0	0	4	27	151	4.87
Electrocution of students due to open sockets;	0	0	0	1	30	154	4.97
Injuries due to usage of single door in the dormitories;	0	1	5	20	5	122	3.94
Overall Mean Rating	0	4	22	63	314	1896	4.70

KEY: MR: Mean Rating

Interpretation of Mean Ratings

1.00- 1.44 = Recorded once per Week (Not Safe)

1.45 - 2.44 = Recorded once per Month (somewhat safe)

2.45 - 3.44 = Recorded once per Term (Fairly safe)

3.45 - 4.44 = Recorded once per Year (Safe)

4.45 - 5.00 = Nil Occurrence (Very Safe)

Table 7. Model Summary on Infrastructure Safety Guidelines on Students' Safety

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.727 ^a	.528	.512	.29747	.528	32.422	1	29	.000

a. Predictors: (Constant), Physical Infrastructure Safety Guidelines

Table 8. ANOVA on the effect of Physical Infrastructure Safety Guidelines on Students' Safety

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.869	1	2.869	32.422	.000 ^a
	Residual	2.566	29	.088		
	Total	5.435	30			

a)Predictors: (Constant), Physical Infrastructure Safety Guidelines

b)Dependent Variable: Students' Safety

Table 9. Linear Regression on Infrastructure Safety Guidelines on Students' Safety

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.690	.488		3.465	.002
	Physical infrastructure safety	.809	.142	.727	5.694	.000

a. Dependent Variable: Safety Physical Infrastructure

The regression equation is $Y = \beta_0 + \beta_1 X$

Where:

Y is dependent variable (students' safety),

X is independent variable (physical infrastructure safety guidelines),

 β_1 is the slope of the regression line and β_0 is constant(y- intercept) value when x is zero.

First, the level of implementation of physical infrastructure safety guidelines and the students' security status were computed. The results were as shown in Table 5 and Table 6. From Table 5, it can be noted that the level of implementation of physical infrastructure safety guidelines with respect to approval of physical infrastructure (4.16), expertise in use of fire extinguishers (3.97), beds and space (3.71), patrol by security personnel (3.61) and inspection of hygiene standards in the dormitories and learners (3.61) were highly rated amongst the physical infrastructure safety guidelines as partly accomplished. This means that the level of implementation was above average but not fully accomplished. Other aspects including dormitory register (3.35), availability and service of fire extinguishers (2.85) and corridors in the school (2.48) were found to be moderately accomplished. This means that the level of implementation was half way done. Indeed, the rating of approval of physical infrastructure at 4.16 can be attributed to the fact that all the buildings that were either currently under construction and those which were recently constructed had approval by the Ministry of Education, public health and the public works officers. However, it was not possible for the researcher, even after probing to ascertain that all the buildings in the school were approved by the relevant bodies, since there were no records of old buildings. Availability of strictures approved by the Ministry of Education and Public Health and the Public Works meant that the students would be secure in these schools. Expertise in use of fire extinguishers (3.97) was rated as partly accomplished, meaning above average but not fully accomplished. The rating of dormitory registers (3.35) and patrol by the security personnel (3.61), were found to be in agreement with Onyango (2013) who established in his study in Homa Bay County that most school administrators (52.9%) took roll calls very often before students retire to bed on a regular basis and that there were regular patrols by the school security personnel to ensure safety in the schools.

The low rating of corridors in the schools at 2.48, moderately accomplished, was due to the observation that was made which indicated that about half of the schools had wide, well lit and well ventilated corridors. However some schools had narrow corridors due to the fact that most of the buildings were closely constructed, probably due to small piece of land for the school or due to poor planning. Indeed, poor planning was to blame in a number of schools as a vast land would be observed being unused while the buildings concentrated at one point. Lighting however was found to be satisfactory in many of the schools. The availability of wide corridors would allow the students to move more easily without fear of collision amongst them. Overall, implementation of physical infrastructure safety guidelines was rated at 3.35 meaning that it was moderately accomplished in public boarding secondary schools in Homa Bay County. Availability and service of fire extinguishers was rated at 2.38 meaning least accomplished. From Table 6, safety of learners with respect to physical infrastructure safety guidelines was found to be very safe overall rated at 4.70. Aspects like loss of life in dormitory fires due to poor evacuation procedures and loss of life in dormitory fires due to lack of emergency door were both highly rated at 5.00, meaning they were very safe. Other aspects which were rated as very safe included: electrocution of students due to open sockets (4.97), casualties due to lack of stairway rails (4.90), injuries of students due to slippery floors (4.87), perimeter wall collapsing on students due to poor workmanship (4.87), physical injuries to students as a result of doors opening inwards (4.87), loss of students' properties in dormitory fire

due to absence of / inadequate fire extinguishers (4.84), students injured due to lack of ramps/ special pathways (4.84), eye problems to students due to poor lighting in classrooms/ library (4.84), and school broken into by strangers stealing students' property due to lack of watchmen (4.48). However, the students were found to be more secure with respect to injuries due to usage of single door in the dormitories and destruction of students' property due to roof leakages as rated at 3.94 and 3.74 respectively. Electrocution of students due to open sockets was realized in one school and was therefore rated at 4.97, meaning very secure. In the school where a student had been electrocuted, it was established that a fellow student had done this intentionally taking advantage of an open socket that was in the laboratory. However, it was noticed that in the rest of the schools, this unfortunate event had not occurred. No open sockets were observed in the schools visited except in one of the schools where it was noticed but was disabled. The students were therefore very safe with respect to this aspect. The aspect of casualties due to lack of stairway rails was highly rated (4.90), meaning that the students were very safe. It is worth reporting that most of the schools had no storey buildings and therefore no stairways. During data collection, it was revealed that in three schools, such cases had been experienced and there were serious injuries to the students involved. The students were however, found to be very safe in public boarding secondary schools with respect to stairway rails in the storey buildings. The rating of injuries of students due to slippery floors at 4.87 meant that the students were very safe. It was established that this incident had occurred in four schools but not very frequently. On observation, it was noticed that in schools where tiles had been used, they were found not to be very slippery, which was good and hence students were very safe. It is a common phenomenon that very slippery tiles are always hazardous to the users. In many schools visited, the tiles were of appropriate texture to prevent learners from slipping particularly after mopping.

Perimeter wall collapsing on students due to poor workmanship equally highly rated at 4.87. This means that the students were very secure. However, it was noticed that in some three schools, an incident of this nature had occurred, though the students involved were not seriously injured. In the rest of the schools, such an incident had not occurred and therefore the students were very safe. Whenever walls are not well reinforced, it can fall without notice and this would be very disastrous to the students. The high rating on physical injuries to students as a result of doors opening inwards (4.87) meant that the students were very safe. However, it was noticed that in some four schools, students had suffered injuries and this was noticed to be in classrooms. Whereas the Ministry guidelines require that the doors should open outwards, it was noticed during observation that a good number of classrooms had their doors opening inwards. This was quite dangerous to students in case of emergency. It is clear that whenever there is emergency in the dormitories; students will always scramble for the door to escape. As a result, the students even get more injuries and may even die due to suffocation. The students were however found to be very secure with respect to this aspect. Loss of students' properties in dormitory fire due to absence of / inadequate fire extinguishers was also highly rated at 4.84, meaning that the students in public secondary schools were very safe. In some three schools, students had lost their property since there were inadequate fire extinguishers. In other schools however, the incident had not occurred and based on the observation, the fire extinguishers were still inadequate

in a good number of schools. This meant that in case of fire outbreak, it would be difficult to control of put it out due to inadequacies cited. The students however, were very secure with respect to this aspect. The aspect of eye problem to students due to poor lighting in classrooms/ library was rated at 4.84, meaning that the students were very safe. It was noticed that in some 3 schools, a few students had been affected by poor lighting causing eye problems. On close observation, it was noticed that indeed, the spacing of lights would not allow for sufficient light in the entire class and library in some schools and this was dangerous and could result in eye problems to students. However, the students were very safe with respect to this aspect. The rating of students injured due to lack of ramps/ special pathways at 4.84, meant that students were very secure. In some four schools however, there were casualties reported due to lack of ramps for students who were physically challenged. In many schools visited, there were ramps which were well placed in all the buildings. This would actually ensure that students are secure. Based on the number of students using such ramps, if not well protected, the students may slip and fall causing injuries among the students. The students in public boarding secondary schools in Homa Bay County were very safe with respect to students injured due to lack of ramps/ special pathways.

The aspect of breaking into school by strangers stealing students' property due to lack of watchmen was rated at 4.48 meaning that the students were very safe. In some twelve schools, such incident had occurred and this posed a lot of insecurity in these schools to the learners and the entire school fraternity. In one of the schools it was revealed that at one time, students woke up and found their classrooms in a mess and established that their dictionaries had been stolen. This was really strange and the security officers who were on duty that night were put to task to explain what had happened. One of them almost lost his job in this incident. However, in most of the public boarding secondary schools, this incident had not occurred and therefore the students were very secure. The findings on injuries due to usage of single door in the dormitories showed that the students were more secure as rated at 3.94. Out of the 31 schools visited, only five schools had all their dormitory doors being double. However, in some other schools, there was at least, a single door in a dormitory for use, more particularly in the old buildings. This means that whenever there would be an emergency, students would be scrambling for the single door, to enable them exit. Injuries were therefore reported in 26 schools which were visited. The students were however, found to be more secure. Destruction of students' property due to roof leakages was rated at 3.74, meaning the students were more safe. In the schools visited, there were both old and new roofs. Whereas in five schools there were no roof leakages that destroyed student's properties, the other twenty six schools recorded some incidences. This actually made students insecure and the administration needed to act and do necessary repair on the leaking roofs to curb such incidences. The students in public boarding secondary schools in Homa Bay County were however, found to be more safe. To test the hypothesis that: physical infrastructure safety guidelines have no effect on students' safe in public boarding secondary schools in Homa Bay County, simple regression analysis was run at 0.05 level of significance. To do this, mean ratings of the status of implementation of physical infrastructure safety guidelines and the mean ratings of the status of students' security were used to run the regression analysis and the results tabulated in Table 7.

From Table 7, it was established that there was a strong and positive effect of physical infrastructure safety guidelines on students' safety of 0.727, which was also found to be statistically significant as $p < 0.05$. Hence the study rejected the null hypothesis that: physical infrastructure safety guidelines have no effect on students' safety in public boarding secondary schools in Homa Bay County. Further, the adjusted R^2 value of 0.512 implies that the implementation of physical infrastructure safety guidelines accounted for up to 51.2% of the total variance in students' security in public boarding secondary schools in Homa Bay County. Hence other factors contribute 48.8% in the changes in students' safety. This means that contribution of physical infrastructure on students' safety is above average. In order to test whether implementation of physical infrastructure safety guidelines could be used to predict students' safety, ANOVA was computed and the results were as shown in Table 8. From Table 8, it was revealed that physical infrastructure safety guidelines was a significant predictor of students' safety, ($F(1, 29) = 32.422, p = .000$). This means that implementation of physical infrastructure safety guidelines can be relied on in enhancing students' safety in public boarding secondary schools in Homa Bay County. To establish the actual effect, linear regression analysis was computed. The results were as shown in Table 9. From Table 4.9, it can be observed that one unit increase in implementation of physical infrastructure safety guidelines (X) leads to an increase in students' safety by 0.809 units as signified by the coefficient 0.809. This means that when implementation of physical infrastructure safety guideline is increased by one unit, then the safety of the students would be increased by another 0.809 units. From the findings in Tables 7 - 9, it is clear that physical infrastructure safety guidelines have effect on students' safety. Therefore the null hypothesis which stated that: physical infrastructure safety guidelines have no effect on students' safety in public boarding secondary schools in Homa Bay County was rejected at 0.05 level of significance. It was further established that physical infrastructure safety guidelines accounts for 51.2% of the variation in the students' safety. The effect was found to be significant and this means it can be relied on when influencing the students' safety.

DISCUSSION

Expertise in use of fire extinguishers was rated as partly accomplished, meaning above average but not fully accomplished. This finding is contrary to those of Mutua (2016) and Chemeli, Mwangeli and Barmao (2015). The findings on the expertise in the use of fire extinguishers was contrary to the findings by Mutua (2016), who established that most schools had not trained staff and students on fire disaster risk reduction and also the findings of Chemeli, Mwangeli and Barmao (2015), who found out only 33.3% of the teachers, had been trained on fire fighting. According to Ayonga (2016), the results showed that even though most schools have the fire fighting equipments, due to inaccessibility of these equipments and lack of proper training of teachers, staff and students, most schools are not adequately prepared for the emergencies. The study recommended training of teachers, staff and students on fire emergency response. Also contrary to this finding was that of Wambui (2012), who established that teachers hardly had any training on implementation of safety measures in which 70% of the principals disagreed that the school organized training on safety for teachers and students.

Only 30% agreed that schools organized for such trainings. Kitheka (2016) also found out that there was inadequate staff training, though majority of the teachers were familiar with safety standards manual. The researcher established that public boarding secondary schools in Homa bay County, had evidence on training of students, teachers and watchmen on the use of fire extinguishers on a yearly basis in most schools. On beds and space in the public boarding secondary schools, the rating could be attributed to the fact that many of the schools did not have bulk beds but were closely spaced. Closer spacing could be due to higher number of enrolment in these schools, which were considered to be the best within the County of Homa Bay. However, the close spacing would actually promote spread of contagious diseases, more particularly at this time when the entire World is faced by the challenge of Corona Virus. At the same time, in case of any emergency, it would lead to more injuries amongst the students. The rating meant that the aspect of bed and space was partly accomplished in public boarding secondary schools in Homa Bay County.

Inspection of hygiene standards in the dormitories and learners was rated partly accomplished. During the observation by the researcher, it was noted that the dormitory masters and class masters were highly involved in looking into the hygiene standards both in the dormitory and classrooms. It was also established that students mopped their dormitories daily and the beds were well spread. Most of the students had their mosquito nets hung and it was a policy in some schools that no student was allowed to be in school without mosquito nets. However, most of the mosquito nets were torn and hence not serving their purpose. Whereas some students during the focus group discussion appeared to be having long untidy nails, they seemed to be hiding them away as it was against the school policy. Another school policy that was established in a few schools was that all students had their hair cut after every fortnight in the school compound. Effective use of dormitory registers would actually be useful in ensuring the students are in their dormitories in the night and would even guard the students against the temptations of sneaking out of school in the night, risking their lives. These ratings meant that the status of implementation in public boarding secondary schools in Homa Bay County were moderately accomplished with respect to dormitory registers and partly accomplished with respect to patrol by security personnel.

Even though the expertise in the use of fire extinguishers was highly rated, it was established that many of the buildings in the school had no fire extinguishers. However, the key areas like dormitories and dining halls in all schools had fire extinguishers strategically placed by the entry points. Moreover, those that had the fire extinguishers had no evidence of servicing the same, except for a few institutions. This finding actually concur with those of Mutua (2016), who established that fire fighting equipments in most schools were not enough contributing to fire safety unpreparedness. Availability of serviced fire extinguishers in schools would actually ensure that the students are safe in the event that there is a fire outbreak in the school. At the same time, it would help the administration in organizing fire drills in the compound to help the learners and teachers acquaint themselves with fire fighting techniques. The general status of implementation concurs with the findings of Nyakundi (2012) that the Ministry of Education Safety Standards and Guideline had not been fully implemented majorly due to inadequate funds and inadequate supervision.

The rating of loss of life in dormitory fires due to poor evacuation procedures and loss of life in dormitory fires due to lack of emergency door at 5.00 means that the students were very secure. Indeed, most of the schools visited had not experienced dormitory fires and those that experienced, had no deaths recorded meaning good evacuation procedures. On the dormitory emergency doors, it was established that emergency doors were available in many of the schools visited, except that in some of these schools, the doors were locked. Locking emergency doors actually made the lives of students at a great risk in case of fire outbreak in the dormitories. The study therefore concluded that, with respect to evacuation procedures and emergency doors, the students were very secure, since there were no records of loss of life due to these aspects. Overall, students were found to be very secure with respect to the status of physical infrastructure safety guidelines in public boarding secondary schools in Homa Bay County. These findings disagree with those of Njoki (2018) whose study showed that school physical infrastructure facilities were not safe as many schools had not adjusted the doors and windows of classrooms and other school facilities as per the requirements of the safety standards manual. At the same time, Gatua (2015) also disagrees with the findings in her study which concluded that most of schools' physical facilities were not as safe as required and that it was evidenced by the presence of unsafe, squeezed, ill equipped and poorly maintained physical infrastructure.

Whereas the contribution of physical infrastructure safety guidelines was above average, there were still inadequacies. On observation, it was noted that in most of the schools, there were either few regularly serviced fire extinguishers or just a few fire extinguishers which were not serviced regularly. This finding was also corroborated by a student's response during a focus group discussion: "We have seen fire extinguishers just in a few buildings in the school, however, we have not seen any time when these fire extinguishers were serviced. Some of them dangerously hung and some have lost their stopper clips. This makes us unsafe in the school and in case of fire outbreak, they may not be useful." This disclosure by the student meant that the schools were still not well furnished with the fire fighting equipments as they were few and moreover, they were not regularly serviced. This therefore means that in such schools the level of accomplishment was very low and this made the students insecure in such schools. This would actually explain why the contribution of physical infrastructure safety guidelines on students' security was not so high in public boarding secondary schools in Homa Bay County, Kenya. On dormitory registers, most of the schools were found to have the roll call taken after every two days which gave a lee way to students to sneak out of school for a day or two, thus compromising the security of the learners. Moreover, the fact that these registers were marked by dormitory prefects, made it possible for collusion among the students and the dormitory prefects, thus the contribution of physical infrastructure safety guidelines on students' security in public boarding secondary schools. It was also established that in a number of schools, security personnel have designated areas in school compound to be manned by different security officer, but were only manned in the night. Moreover, in a good number of schools, there were a few security officers who manned the school compound both at the day and night. This low number would mean that some places were not manned or the personnel overworked to an extent that they would not appropriately do their work.

This would in turn compromise the students' security. Higher number of school security personnel would indeed improve the students' security in these schools. When asked about the status of implementation of physical infrastructure safety guidelines, one Sub County Quality Assurance and Standards Officer said: "Most of the physical infrastructures in the public boarding secondary schools in this Sub County are well in place. However, because of the overwhelming numbers of the students in the school in the recent past, the facilities are overstretched." Indeed, this would mean that before increased enrolment in secondary schools, the implementation of physical infrastructure in public boarding secondary schools was adequate. However, as the number of admitted students increased, there was a possibility of congestion in the dormitories, classrooms and other physical infrastructure facilities resulting in the contribution of this aspect on students' security. With 100% transition from primary schools to secondary schools, most of the physical facilities were overstretched including insufficient classrooms, dormitories, dining halls, library etc leading to congestion. On safety of students, it was observed that there are some schools where strangers had stolen students' property due to lack of or inadequate watchmen showing that students were insecure. It was also noticed that some students' properties were destroyed by rain water due to roof leakages, meaning that repair and maintenance was not done regularly in these schools. Whereas many schools were found to have double doors in the dormitories, some few schools still had single doors in some old and make shift dormitories, causing injuries to students as they struggle to leave during any emergency. These observations meant that students were still not very secure in public secondary schools in Homa Bay County.

This finding was actually in line with those of Nyakundi (2012), Migiro (2012) and Kukali (2013) who established in their studies that safety policy guidelines had not been fully implemented, and that lack of financial and human resource were major challenges. These studies revealed that many schools had not fully implemented the physical infrastructure safety guidelines. Moderate accomplishment in implementation of physical infrastructure safety guidelines justifies the contribution to students' security by 51.2% in public boarding secondary schools in Homa Bay County. From the findings in it is clear that physical infrastructure safety guidelines have effect on students' security. This finding was found to be in agreement with Mokaya (2013), who established that improved academic achievement is associated with more adequate and well spaced classrooms, adequate and ample spacing in the libraries, adequate science laboratories, adequate water and sanitation facilities and adequate participation in co curricular activities. In deed these are also the requirement for safety among the students in relation to physical infrastructure safety guidelines. Similarly, Musyoka (2013) also indicates that schools do not have adequate physical facilities including laboratories, classrooms, libraries, desks and toilets which negatively impacts on schools in academic performance. Whereas, both Mokaya (2013) and Musyoka (2013) found out a positive relationship between safety policies and academics, Kibriya (2018) confirmed in his study that there was a negative effects of an unsafe school environment of learning outcomes for reading and math of Rwandan students, who self – reported their perception on school safety. The results show that for 6th grade math evaluation, a student who feels unsafe solves seven fewer addition problems correctly per minute (36% deviation from average performance) compared to peers who feel safe at

school. This finding by Kibriya (2018) shows that for better performance, learners require a safe environment which can only be provided by implementing safety policy in our schools. In other words, implementation of physical infrastructure safety guidelines affect positively security of the learners which consequently affect positively their performance in academics. The above studies established that there was a statistically significant effect of safety on students' performance. The current study however, has established that physical infrastructure safety guidelines had statistically significant effect on students' security in public boarding secondary schools in Homa Bay County, Kenya.

CONCLUSION

Physical infrastructure safety guidelines had strong and positive effect on students' safety: Thus;

- Approval of physical structures had the highest effect on students safety in schools.
- Expertise in use of fire extinguishers had the highest effect on safety of students in schools.
- Appropriate spacing of beds in schools had high effect on students safety in dormitories.
- Patrol by schools personnel had high effect on student safety in schools.
- Inspection of hygiene standards in dormitory and learners had a high effect on student safety in schools
- Dormitory registers, availability and servicing of fire extinguishers, and spacious corridors in schools had high effect on students safety.

RECOMMENDATIONS

With regard to the findings that physical infrastructure safety guidelines had strong and positive effect on students' safety, the study recommended that Principals should strive to fully implement the physical infrastructure safety guidelines to enhance students' safety in public boarding secondary schools in Kenya.

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