Influence of Safety of Physical Infrastructure and Financial Resources on Safety Standards Implementation in Public Secondary Schools in Kipkelion Sub-County, Kericho, Kenya

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Abstract: *Unsafe learning environments negatively influence students' performance and overall school functioning. Despite the existence of school safety standards in Kenya, cases of unsafe learning conditions continue to rise, signaling gaps in policy implementation. Guided by Systems Theory, the study examined the extent to which safety provision of safety physical infrastructure, and allocation of financial resources influence safety standards implementation. A descriptive research design was adopted. The target population comprised 40 principals, 412 teachers, 12,058 learners, and 1 Quality Assurance and Standards Officer. Using stratified and simple random sampling, the study sampled 12 principals, 124 teachers, 1,206 learners, and 1 Quality Assurance and Standards Officer. Data collection instruments included questionnaires, focus group discussions, interview schedules, and observation checklists. Quantitative data were analyzed using descriptive and inferential statistics, whereas qualitative data were thematically analyzed and presented narratively. The findings revealed moderate but uneven implementation of safety standards in secondary schools. Provision of physical safety infrastructure demonstrated a moderate influence ($R^2 = 0.161$), with structural features such as certified buildings and outward-opening doors well implemented, but safety signage and fire assembly points notably inadequate. Financial resource allocation also showed a significant but limited effect ($R^2 = 0.125$), with many schools relying heavily on external support. The study concludes that effective safety implementation requires a holistic and integrated approach. The study recommends improving safety signage and emergency infrastructure, and establishing dedicated safety budgets within school financial plans. Significantly the study will assist in enhancing the safety policy and safety standards in secondary schools.*

Keywords: Safety, Infrastructure, Financial, Standards, Kipkelion

1. Introduction

A safe school environment is the foundation of quality education. School safety forms an indispensable and integral element of the instructional process in schools. No significant classroom instruction can occur in an environment which is insecure and unsafe for teachers and students. Hence, it is essential that school management promote secure environment which promote increased student admission rate, retention, completion due to quality education being provided (Lussier & Fitzpatrick, 2016).

School safety involves the procedure of setting up and keeping institutional environment that is emotionally, cognitively, and physically safe environment for teachers and students to enable curriculum implementation (United Nations Education, Scientific and Cultural Organisation – UNESCO, 2011). This involves the activities of maintenance of a structurally safe building infrastructure, undertaking safety drills, and having a channel where teachers and students can report concerns or incidents of abuse. Research shows that when learners feel secure, they have a good learning atmosphere. Teachers become effectively better when they understand learners are well managed and can concentrate during classroom learning (Ozmen, Dur &Akgulc, 2010).

The advantage of institutional safety in quality education provision is well researched by many scholars (Reyes et al, 2012, Glariana & Solar, 2015; Maxwell et al., 2017). The reason for having safety schools has been further emphasised by several international conventions; United Nations Conference held in Kyogo Japan in 2005 and UN conference held in Geneva Switzerland in 2009. These two conventions appealed to member states to conduct evaluation of existing educational and health infrastructure in schools by the year 2011 and create and implement country action plans for safe hospitals and schools in their disaster-prone regions by the year 2015.

The alarm over schools' safety initially came into reality during the 2005 UN conference held in Japan dubbed as 'Hyogo Framework for Action (HFA) 2005 – 2015: Building the Resilience of Nations and Communities to Disaster.' It was followed by a chain of other conventions which emphasised the significance of institutional safety. UN conference of 2009 held in Geneva Switzerland emphasised on national evaluation of institutional infrastructure whereas the Global Platform for Disaster Reduction (2013) demanded for having global safe health and school infrastructure movement be started in disaster risks regions with funding and pledges by the year 2015. It was observed that goal of having safety schools was limited due to inadequate infrastructure facilities, inadequate finance, low awareness on school safety, lack of adequate training on school safety in addition to low understanding of school wide approach on safety (UNESCO/UNICEF, 2013).

In responding to the challenges mentioned above, the United Nations came up with a programme that focused on 'thematic platform on knowledge and education' to support members states in creation of holistic measure to institutional safety. For instance, the world baseline survey on school safety offered procedures and suggestions to member states for implementation of school safety including effective assessment of school safety. The UN created global responses for safe schools which emphasised on supporting and motivating member states to create national approaches and implement institutional safety (UN, 2013). The programme is founded on comprehensive institutional safety framework and explains a safe school as a combination of disaster resilience infrastructure (safe learning facilities), institutional disaster management, resilience education and disaster risk reduction (UN, 2013). For continental and individual member states to achieve institutional safety, United Nations Children Fund (UNICEF) produced a safety manual for schools to be used by teachers in developed countries. This safety manual was issued as part of instructors training and development initiative for peace building in Sub Saharan Africa countries project. The manual desire to training teachers and providing them with knowledge and skills required for setting up and maintenance of basic institutional safety (UNICEF, 2017). The manual affirm that is the mandate of school board of management to set up a risk-free environment for students and teachers in schools. UN Sustainable Goal No. 4 also supports the call for safe schools' environment (UNESCO, 2015).

According to Benbenishty and Astor (2005), every nation to a particular degree is worried on the issue of safety in schools. This is due to recurrence disasters and accidents in educational institutions like collapsed school buildings, gun attacks, floods and fires which have disrupted classroom instructional tasks in schools. In view of the above, schools in United States of America, Asia, Europe, Australia, and Africa took safe school initiative to fulfil the Hyogo Framework Action 2005 – 2015.

In USA, a manual for prevention and response to institutional violence, International Association of Chiefs Police 2nd edition (2009), explains mitigation measures to ensure schools are safe. These include training school personnel on how to detect; prevent and respond to a violent individual within a school environment; security controls such as access controls; security procedures such as lock down and evacuation as well as rapid response to an incident in schools (Marquet, 2013). The current study sort to collect empirical evidence to establish if this is the scenario in Kenya hence filling the geographical gap.

In Asia, the Association of Southeast Asian Nations (ASEAN) Safe School Initiative (ASSI) came into being in the year 2012 under the scope of ASEAN committee on management of disasters. It promotes a comprehensive approach to school safety so that children become more buoyant to catastrophe and to have a secure and safe environment for learning in Southeast Asia. It comprises of three features: school disaster management, safe educational facilities, risk reduction and resilience learning informed by training.

In advancing secure educational environments in South Africa, present methods on promotion of institutional policies have been set up. Mgadla (2006) indicated that these methods consist of excellent initiatives like *Tiisa Thuto, Crisp,* and *Cass. Tiisa Thuto* consists of creating of partnerships among educational institutions, parents, neighbours and local businesses in tackling security requirements of schools. The Crisp plan organises institutional safety groups to connect schools, parents, local community organisations and police. Cass is a widespread design involving national government development policies, local community partners and support resources for safety committees, teachers and head teachers. This has reinforced institutional – community collaborations and children involvement and hence addressed issues of teaching and learning environment and quality of education.

The Safe School Contract has been implemented in Uganda as one of the notable measures that reinforce the responsibilities of parents, learners and teachers and their participation in safety teaching and learning activities in schools (Lulua, 2008). The current study sort to collect empirical evidence to establish if this is the case in Kenyan schools hence filling the geographical gap.

In the year 2003, Kenya's Ministry of Education agreed into a cooperation initiative dubbed School Safe Zones with Church World Service (CWS) to promote improved safety for students in schools. The programme was successfully piloted in a few selected schools. it was due to the accomplishment of the pilot stage of the initiative that the Ministry of Education with the support of CWS met a group of specialists to develop the 'Safety and Standards Manual for use across Kenya's educational institutions in 2008. The *Safety and Standards Manual* comprises of these safety matters: safety in the school environment, safety in physical facilities, nutrition safety, health and hygiene safety, safety in instructional environments, safety against drug, alcohol, and substance abuse, safety of learners with special needs, social-cultural environment of the school, transportation safety, safety against abuse of children, safety on school grounds and institutional community interactions (MOE, 2008). This safety handbook embraces varied matters which have an impact on safety of teachers, students, parents and neighbouring communities around the schools.

Despite Ministry of Education attempts to develop safety guidelines and standards, schools across the country have a long-lasting account of terrible tragedies. These disasters have result to loss of lives, injuries and damage to school infrastructure through recurrent fires and arson in schools. Some of the incidents recorded include 68 students lost their lives and many were injured as a result of school fires (Odalo, 2001). As reported by The Standard Newspaper of 7th March 2011, Wandubi mixed secondary schools in Tetu

Nyeri County was burnt down and property worth millions of shillings destroyed. The fire was caused by faulty electrical wiring in the school.

In 2024 based on safety report concerns, the Ministry of Education directed the immediate shutdown of boarding facilities in 348 primary schools nationwide due to non-compliance with safety regulations. This decision emanated after a thorough evaluation carried out in September and October 2024 to assess whether these institutions were meeting the required Safety Standards for Basic Education Institutions. In an official circular dated November 27, 2024, Education Principal Secretary Belio Kipsang disclosed that these schools had committed significant breaches of essential safety requirements.

Kipkelion Sub-County secondary schools have not been spared also on safety challenges. Based on Sub-County Director of Education (SDEO), a number of schools have lost property through fire, theft and the sub-county has witnessed injuries of both teachers and learners arising from various safety risky incidences reported (SDE-Kipkelion, 2024). It is for this basis that the researcher undertook to assess influence of safety awareness and training on effective implementation of safety standards in public secondary schools in Kipkelion Sub-County, Kericho County, Kenya.

1.1 Statement of the Problem

Notwithstanding the issuance and existence of the School Safety Manual and other supportive policies, safety issues in schools are on an upward trend. In an official circular dated November 27, 2024, Education Principal Secretary directed the immediate shutdown of 348 boarding schools' facilities nationwide due to non-compliance with safety regulations. He disclosed that the schools had committed significant breaches of essential safety requirements. Quality Assurance Assessment reports obtained from Kipkelion Sub-County Education Office (2023) indicates issues of safety concern in several secondary schools like; absence of emergency doors in dormitories and classes, porous perimeter fence, non-existent repairs of physical infrastructure facilities, inadequate fire extinguishers, lack of safety awareness, existence of grilled windows, and overcrowded classrooms and dormitories. It is against this information that the study was conducted to determine influence of safety awareness and training on effective implementation of safety standards in public secondary schools in Kipkelion Sub-County, Kericho County.

1.2 Purpose of the Study

The purpose of this research was to assess influence of safety awareness and training on effective implementation

of safety standards in public secondary schools in Kipkelion Sub-County, Kericho County

1.3 Study Objectives

The specific objectives of the research were :
  i.   To what extent does provision of safety physical infrastructure influence effective safety standards implementation in public secondary schools in Kipkelion Sub-County?
  ii. To what extent do financial resources influence effective safety standards implementation in public secondary schools in Kipkelion Sub-County?

1.4 Theoretical Framework

This research adopted the systems theory whose proponent is Ludwig von Bertalanffy (1968). It is an interdisciplinary theory relating to each system in society and a framework that can examine an occurrence from a holistic view. Golinelli (2009) said that each element in any system is logically linked towards a mutual objective. A system may also be explained as a combination of items unified by some aspect of interdependence or regular interaction. A system can also be like ocean or built like school, physical such as, space shuttle or conceptualized like plan, closed like a closed bottle; open such as trees, static - bridge or dynamic- human (Tien & Berg, 2003). A system can be natural Systems elements or components can be varied they include: people, products and processes; its qualities, input, and output; relationships, which entails interactions between components and characteristics.

The theory is guided by four key components. The first component is the item that involves variables or parts within a system. The second component is that a system is composed of features which may consist of properties or qualities of the system and its objectives. The third component is that the system has internal association among its objects. The fourth component is that a system has been conceived as to exist in a particular environment. It can be deduced that a system is a group of objectives which may influence one another in an environment and constitute a bigger model which is diverse from any of the parts.
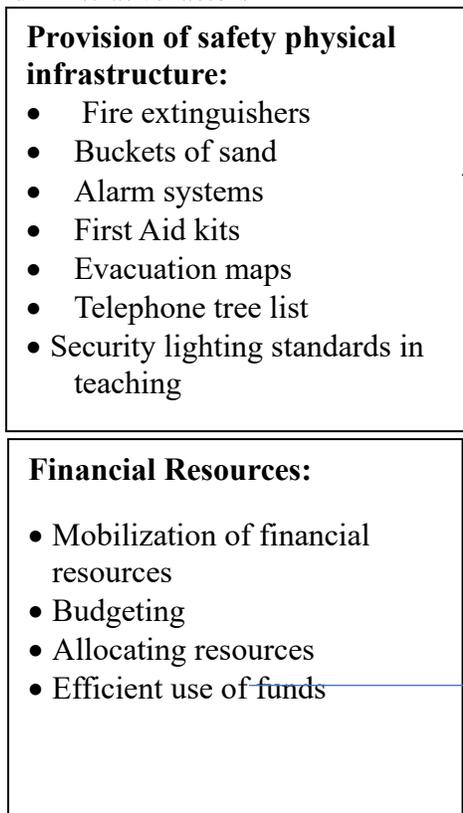
The school is an equivalent of a system in that it is made up of various sub-systems such as the managers Board of Management (BOM), the administrators like the head of institution, deputy principal, senior teachers, student council, teaching staff, and administrative staff among others. In order for these elements to coordinate appropriately, they have attributes that must interact. These are the qualities of the stakeholders of the schools. Learners are perceived as raw materials that have to undergo processes to be channelled out to society as finished useful products to the society. The school management and other stakeholders have to provide inputs that go through the necessary processes so that the desired outcomes are realized.

In the current study, in order for a school to attain safety status, management and all other stakeholders in and outside school have a task to undertake to make sure safety is attained in schools to achieve required teaching and learning standards. The coordination of all stakeholders by the principal administratively is vital especially when it comes to creating an environment safe and conducive for efficient teaching and learning process. The various components within the school system needs the steady leadership of the principal to function without which any gain can be realised especially on safety component. Systems theory views a school as exceptional and fixed system of interconnect parts. Students, teachers and school administration have to interrelate within a school setting in order to implement institutional vision, mission and core objectives. The system theory becomes essential in this investigation since it sees a school as a system where safety issues have to be taken into consideration and implemented in totality.

1.5 Conceptual Framework

Conceptual framework serves as a guide for the researcher, helping to organize and interpret data and understand the relationships between different variables (Creswell,2014). Figure 1 provides a conceptual framework utilized for the current study.

Independent Variables
Administrative factors

Provision of safety physical infrastructure:
- Fire extinguishers
- Buckets of sand
- Alarm systems
- First Aid kits
- Evacuation maps
- Telephone tree list
- Security lighting standards in teaching

Financial Resources:

- Mobilization of financial resources
- Budgeting
- Allocating resources
- Efficient use of funds

Dependent Variables

Implementation of Safety Standards:
- Reduced Risks
- Safe schools
- Enhanced infrastructure safety
- Adherence to safety standards
- Enhanced academic achievement
- Increased retention and completion rates
- Clean and conducive teaching and learning environment
- Motivated personnel

Intervening Variables:
- Stakeholders 'commitment
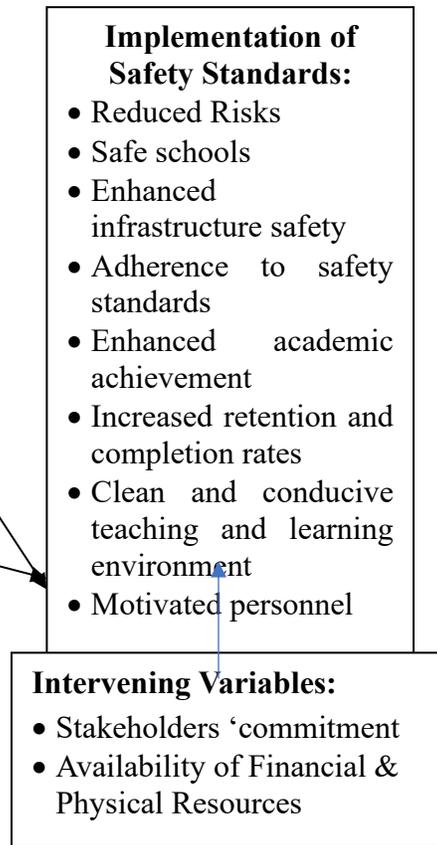- Availability of Financial & Physical Resources

Figure 1: Conceptual Framework

The study conceptualises administrative factors (Provision of safety physical infrastructure and financial resources) as independent variables and implementation of safety standards as dependent variable. In schools, strong administrative leadership is essential for developing a safe school environment and ensuring that safety education is part of the total school programmes. Administrative actions envisaged in this study as independent variables entail provision of safety physical infrastructure and financial resources based on legally provided safety documents such as: safety standards and guidelines manual; public works and building guidelines; public health act; education act among others.

Provision of safety physical infrastructure like fire extinguishers, buckets of sand, evacuation maps, alarm systems, first aid kits, telephone tree lists, safe classes, dorms labs, security lighting, libraries among others. Safety training for members of staff practices like: Fire drills, First Aid kits, Lockdown, Evacuation procedures, and incorporation of Safety standards in teaching. Mobilisation of financial resources, budgeting and allocating these resources to secure the safety of staff and

learners in school is vital. On the other hand, effective implementation of safety standards as dependent variable will realize outcomes such as: reduced risks in school, enhanced infrastructure safety, adherence to safety standards, enhanced academic achievement, increased retention and completion rates, clean and conducive teaching and learning environment and have personnel motivated personnel.

Intervening variables include stakeholder commitment and availability of financial and physical resources. The effectiveness of implementing safety standards in public secondary schools is influenced by the level of cooperation from various stakeholders, including teachers, students, parents, and the Board of Management (BOM). Moreover, the implementation of safety standards requires adequate financial support and infrastructure. Limited funding for safety programs, lack of essential safety equipment, and poorly maintained school facilities can hinder efforts, regardless of administrative efforts.

To mitigate against these variables it will be prudent to enhance stakeholder engagement by organizing regular

sensitization programs and training for teachers, students, and parents to create awareness of their roles in implementing safety measures. Strengthening collaborative decision-making involving all stakeholders to ensure effective participation in school safety initiatives. Additionally, improving resource allocation and utilization through advocating for increased government funding and seeking alternative sources of financing, such as corporate sponsorships and community contributions, to support safety programs. By addressing these intervening variables, school administrators can enhance the effectiveness of safety standard implementation in public secondary schools in Kipkelion Sub-County.

2. Literature Review

2.1 Provision of Safety Physical Infrastructure and Implementation of Safety Standards in Schools

A safe and secure school infrastructure is essential to ensure that teaching and learning activities are conducted effectively. The educational infrastructure in schools consists of: libraries, classrooms, kitchens, laboratories, playgrounds, toilets, dining halls, dormitories, among others. Based on the MOE (2008) safety standards manual, school infrastructure have to be constructed and designed appropriately, they are adequate and well situated free of any risks to people in the schools. The school buildings must meet the Ministry of Public Works building regulations and Standards, Public Health Act (Cap 242), and provisions of the Education Act (Cap 211).

The installation of surveillance cameras in schools enhances security level for students, teachers and other people working or operating within the school hence school management have to ensure these gadgets have been installed (Oguye, 2012). Hence, failures to have comprehensible communication mechanism and security plans, schools are at high danger of being infiltrated by attackers and thieves. Failure to ensure there is proper fencing within the school environment and excessive admission of learners without taking into consideration the carrying capacities does not only undermine security and safety standards but overall provision of quality education in schools.

Surveys conducted show that school infrastructure facilities have to be safe to make sure that quality instructional processes are undertaken. In Malatya Turkey, Donmez and Guven (2002) established that the most grave security challenges in schools was due to poor constructed and design corridors and unlevelled playing ground. This was in contrary to parents' expectations of having safe and adequate school building structures. The study shows the importance of having safe and secure physical infrastructure facilities in schools. The present study sort to establish the administrative factors influencing effective implementation of safety standards in public secondary Schools in Kipkelion Sub-County, Kericho County Kenyain view of filling the geographical gap given that safety concerns are region dynamic.

In Maryland United States of America, Shannon (2006) explored the available security infrastructure facilities across different categories of schools. Descriptive survey guided the research that targeted a total of 276 public secondary schools. A sample size of 1104 head teachers, teachers and students were selected. It was revealed that most secondary schools did not have safety and security infrastructure facilities needed to ensure school safety. Schools that had adequate safe security infrastructure equipment performed better in academics compared to those that did not have. Learners from institutions that had less or no security infrastructure facilities were found to be more mindful of their security in the schools. Hence, the present research sort to establish the administrative factors influencing effective implementation of safety standards in public secondary Schools in Kipkelion Sub-County, Kericho County.

In Sedibeng District South Africa, Mgadla (2006) examined basic safety and security situation of public secondary (12) and primary (23) schools. A phenomenological approach was used as the paradigm of the study. Purposive sampling was used to select head teachers. Data collection was through use of interview schedule and observation. The research found out that schools located in urban settings were susceptible to unsafe situations and risk of violence because of; design of their school buildings, location of their schools and poor infrastructure resources in school. The research by Mgadla (2006) was qualitative in nature while the present study incorporates both qualitative and quantitative research methods. Additionally, current study fills the geographical gap, as it was carried out in Kenya.

In Kenya, Nyabuti, Role and Balyage (2015) examined how safety policy framework was being implemented in Kenya's secondary schools. A total of 18 national schools constituted the population where a sample size of 6 schools was selected using stratified random sampling technique. It was discovered that there was low safety awareness with differences in students and teachers' attitudes found. Nyabuti, Role and Balyage's study scope was limited to only 6 national schools while the present study was all-inclusive of national, county, extra-county, and sub-county schools for more conclusive results hence filling the scope gap.

2.2 Financial Resources and Implementation of Safety Standards in Schools

In China, Song (2014) examined the implementation of disaster management policy in the education sector. It was found out that disaster preparedness across schools was not given much priority as expected. It was noted that for effective response to emergencies situations like earthquakes and flooding, more finances would be required to implement disaster preparedness programmes in schools. The finances would also help in purchase of drilling equipment. It was concluded that schools located in poor regions were vulnerable to disasters and therefore incapable of implementing disaster management policy effectively.

In United States of America, a study undertaken by New Jersey School Boards Association (NJSBA) School Security Taskforce (2014) discovered that schools in the state were incapable of implementing recommended safety standards because of inadequate finances. It was also found out that high cost of surveillance systems and inability to employ competent personnel in the schools posed security challenges in schools. this implied that for effective safety schools' management, finances are critical.

In South Africa, Xaba (2014) research found out that principals were not able to facilitate teacher training on first aid, weapon detection and mouth to mouth resuscitation safety skills because of inadequate finances faced by schools. This made it difficult for the teachers to detect weapons and conduct first aid in case of disaster incident in schools. The inability of schools to offer training to teachers and students on first aid was greatly affected due to insufficiency of finances to support the programme.

UNISDR (2016) found out that Uganda had not yet been able to incorporate disaster reduction guidelines in their education system. This is especially due to finance challenges that restricted countrywide roll out of the disaster risks reduction plan. UNISDR noted that Uganda needed more money to train teachers and produce materials on safety awareness to be used in schools. The current study sort to collect empirical evidence to establish if this is the scenario in Kenya hence filling the geographical gap.

In Kenya, Kirimi (2014) observed that despite various efforts by public secondary schools in the country to implement safety standard guidelines, inadequate finances were a great challenge that hampered the realisation of this objective. Also at school level, implementation of safety strategies like installation of security cameras, retrofitting existing school infrastructure facilities to be disaster resilient, hiring security guards, installation of safety gadgets like fire extinguishers and raining to create awareness on school safety were significantly hampered by unavailability of finances (NJSBA, 2014). The aforementioned studies concur with Makau (2016) who found out that lack of funds did largely influence safety standards implementation in Yatta Sub County public secondary schools. Makau also found out that most schools were not able to procure adequate security infrastructure facilities due to limited finances.

3. Methodology
3.1 Research Design

Given the survey and observational-based nature of this investigation, a descriptive research design was utilized.

3.2 Research Locale

The study was undertaken in Kipkelion Sub-County. The majority of public schools are located in Kipkelion Sub County, according to the Kipkelion Sub-County Schools Census Report (MOE, 2023), these schools are characterized by low teacher-to-student ratio and a large student population in addition to low safety adoption measures.

3.3 Target Population

Kipkelion Sub County has 40 secondary schools divided into 4 zones namely; Kokwet, Chilchila, Kamasian, and Kipkelion. The target population was 12,511 respondents comprising 40 principals, 412 facilitators, 12,058 leaners and 1 Sub-County Quality Assurance and Standards Officer within the Sub-County. The institutional heads were of interest since they are supposed to spearhead safety standards implementation in schools. Facilitators being the ones assisting the administrators in implementing safety standards in schools they were of interest. Leaners as recipients of safety practices and concerns in school were of interest too.

3.4 Sample and Sampling Techniques

In this study, stratified random sampling was adopted to ensure adequate representation of the three school categories in Kipkelion Sub-County, namely boys' schools, girls' schools, and mixed schools. The schools were first grouped into these strata and a simple random sampling procedure was then used to select 30 percent of schools from each category, yielding a total of twelve schools comprising two boys' schools, two girls' schools, and eight mixed schools. All principals from the sampled schools were automatically included in the study because

of their direct responsibility in overseeing the implementation of safety standards.

Teachers were sampled proportionately from each stratum using simple random sampling, with thirty percent of the teaching population selected to participate in the survey. Learners, however, did not participate in the questionnaire survey. Instead, qualitative data were obtained through Focus Group Discussions conducted within each of the twelve sampled schools. Each school provided one FGD composed of approximately ten learners who were purposively selected to capture a broad range of perspectives in age, class level, and school experiences. The choice of ten participants per group aligns with widely accepted qualitative research recommendations that groups of between six and twelve participants yield optimal interaction, manageable discussion flow, and sufficient diversity of viewpoints. This approach resulted in a total of one hundred and twenty learners taking part in FGDs, distributed proportionately across the school types.

3.5 Sample Size

The sample size for this study was derived from the selected schools and respondent categories. In line with the recommendation by Gay et al. (2011) that ten to thirty percent of a population is adequate for educational research, twelve schools, representing thirty percent of the total forty schools in Kipkelion Sub-County were included in the sample. From these schools, twelve principals were automatically enrolled. For teachers, an initial sample of 124 participants, representing thirty percent of the total teacher population (N = 412), was selected using stratified simple random sampling across boys', girls', and mixed schools. To address the possibility of non-response, absenteeism, transfers, and incomplete questionnaires, common challenges in school-based surveys, a 10% non-

response allowance was incorporated, resulting in an additional 12 teachers. This adjustment increased the teacher sample to a final total of 136, ensuring an adequate effective response rate in line with methodological guidance from Mugenda and Mugenda (2003) and Creswell (2014).

The learners' sample comprised 120 students drawn exclusively for focus group discussions (FGDs), consisting of ten learners from each of the twelve sampled schools. These FGDs provided rich qualitative insights into students' perceptions and experiences concerning safety practices, complementing the quantitative data obtained from principals and teachers. The decision to include ten students per school in the Focus Group Discussions (FGDs) was guided by established qualitative research conventions and methodological recommendations. According to Krueger and Casey (2015), an ideal focus group should comprise 6 to 12 participants, a size that is small enough to allow each participant to contribute meaningfully, yet large enough to generate diverse perspectives and stimulate interaction among members. In the context of this study, selecting ten students from each of the twelve sampled schools ensured inclusivity, representation, and diversity of experiences across different class levels and gender categories. This number was also deemed manageable for the moderator, allowing for effective facilitation, note-taking, and observation of non-verbal cues factors considered essential in qualitative inquiry (Creswell & Poth, 2018).

The Sub-County Quality Assurance and Standards Officer (DQASO) was included as the sole officer responsible for the oversight and enforcement of safety standards in the region. Table 1presents the detailed sampling frame, including the 10% non-response adjustment applied to the teacher sample.

School Type	Category	Population	Sample (30%)	+10% Non-Response	Final Sample	Sampling Technique
Boys	Principals	7	2	–	2	Simple Random
	Teachers	84	25	+2	**27**	Simple Random
	Learners (FGDs)	1,079	20	–	20	FGD: 10 per school
Girls	Principals	9	3	–	3	Simple Random
	Teachers	108	32	+2	**34**	Simple Random
	Learners (FGDs)	1,202	20	–	20	FGD: 10 per school
Mixed	Principals	24	7	–	7	Simple Random
	Teachers	220	66	+7	**73**	Simple Random
	Learners (FGDs)	9,777	80	–	80	FGD: 10 per school
Sub-County	DQASO	1	–	–	**1**	Purposive Sampling
Grand Total	Principals	40	12	–	**12**	
	Teachers	412	**124**	**+12**	136	
	Learners (FGDs)	12,058	120	–	**120**	
	DQASO	1	–	–	**1**	

Source: MoE Kipkelion Sub-County (2024)

3.6 Research Instruments

The research utilized questionnaires, interview schedules, Focused Group Discussions and observation checklists to collect data. Questionnaires were distributed to collect attitudes, feelings, and views beyond the investigator on administrative factors influencing the effective implementation of safety standards in public secondary schools. There was one set of questionnaires for the facilitators. Section one of the questionnaires collected information on demographics. Section two of questionnaires consists of questions on administrative factors influencing the effective implementation of safety standards in public secondary Schools. Interview schedule obtained data from Head of Institutions and Quality Assurance and Standards Officer, Focused Group Discussion obtained data from leaners and finally an observation checklist was utilized to collect information on observable physical aspects of safety in the respective selected institutions as per the study objectives. By so doing the researcher was able to see what has been done and collaborate with data gathered through other instruments (Orodho 2005).

3.7 Data Analysis

Prior to analysis, the collected data underwent rigorous cleaning and coding procedures. This involved checking the questionnaires for completeness, identifying missing values, and correcting inconsistencies. After cleaning, the responses were coded and entered into the Statistical Package for Social Sciences (SPSS) version 26. SPSS was selected for its reliability in handling both small and large datasets and its efficiency in conducting advanced statistical procedures, as recommended by Rahman & Muktadi (2021).

Quantitative data were analyzed using both descriptive and inferential statistical techniques. Descriptive statistics, comprising frequencies, percentages, means, and standard deviations were computed to summarize respondents' views on safety awareness, safety training, and the implementation of safety standards. These findings were presented using tables, charts, and graphs for enhanced clarity and interpretation.

Inferential statistics were used to examine the strength, nature, and predictive power of relationships among the study variables. Pearson's Product-Moment Correlation Coefficient (r) was employed to assess the strength and direction of linear relationships between the dependent variable (Safety Standards Implementation, SI) and the key independent variables that is Infrastructure Adequacy, INF; and Financial Resource Allocation, FIN). To determine the predictive influence of each administrative factor on safety standards implementation, both simple and multiple regression analyses were conducted.

Simple linear regression was used to examine the predictive influence of:(a) Infrastructure Adequacy (INF), and (b) Financial Resource Allocation (FIN) on Safety Standards Implementation (SI).

$$SI = \beta 0 + \beta 1(INF) + \varepsilon$$
$$SI = \beta 0 + \beta 1(FIN) + \varepsilon$$

Qualitative data obtained from open-ended responses, interview schedules, and focus group discussions were analysed thematically. The process involved coding responses, identifying recurring patterns, categorizing emerging themes, and triangulating qualitative insights with quantitative findings to strengthen interpretive validity.

3.8 Ethical Considerations

Prior to filed data collection, the researcher requested for clearance from Kisii University's Institutional Science and Ethics Review Committee. The researcher then applied for a research permit from National Commission for Science Technology and Innovation (NACOSTI). The obtained permit was submitted to the Kipkelion Sub County Education Office in order to get a letter of approval for the purpose of gathering data from the selected schools. The researcher ensured that informed consent was sought first before individual respondents participated in the study. The

respondents were informed that their participation in the study will be on voluntary basis. The researcher explained to respondents the purpose and objectives of the study. The respondents were assured that the information collected from them will be confidential and will be used for the purpose of the study only.

4. Results and Discussion

4.1 Descriptive Statistics

4.1.1 Provision of safety physical infrastructure for Safety

This section sought to evaluate the availability and implementation of essential safety physical infrastructure within schools, an important dimension of Objective 1. Table 2 summarizes respondents' perceptions of key safety features such as certified buildings, perimeter fencing, night lighting, fire equipment, evacuation-friendly structures, and emergency signage. These indicators are critical to assessing whether schools meet the basic physical conditions required to prevent injuries, support rapid evacuation, and enhance overall safety preparedness.

Table 2: Physical infrastructures' Compliance with Safety requirements

Safety Infrastructure Item	SD	D	A	SA	Mean	Std.Dev
School buildings are certified as safe by public health or works authorities.	7	6	63	60	4.20	1.024
The school compound has a perimeter fence to restrict unauthorized entry.	17	19	49	51	3.72	1.413
The school compound is adequately lit at night.	16	13	54	53	3.85	1.349
Fire extinguishers are available and functional in classrooms and dormitories.	33	31	35	37	3.09	1.598
Classroom and dormitory windows meet public works safety standards.	6	7	61	62	4.22	1.009
All school doors and windows open outward for safe evacuation.	9	6	65	56	4.13	1.085
The school has a clearly marked fire assembly point.	40	28	34	34	2.96	1.628
Safety signage (e.g., 'Exit', 'Fire Point') is displayed in key areas.	50	30	32	24	2.22	1.789

The findings reveal a distinct pattern in which schools demonstrate strong compliance with formal structural safety standards, particularly those closely monitored by external agencies such as the Ministry of Public Works and the Ministry of Health. Building certification recorded a high mean of 4.20 (SD = 1.024), with 90% of respondents affirming that their buildings meet official public health and construction requirements. Classroom and dormitory windows meeting public works standards registered the highest mean at 4.22 (SD = 1.009), reflecting consistent adherence to ventilation, daylight, and escape safety

principles. These results align with national research by Oduor and Simatwa (2021) and Njeru (2019), who noted that Kenyan schools tend to comply strongly with construction elements that are externally supervised, officially vetted, or required during school registration and inspection. Evacuation-friendly structural features also emerged strongly, with outward-opening doors and wide windows scoring 4.13 (SD = 1.085), reflecting the impact of post-tragedy directives issued following major dormitory fire disasters in the early 2000s. FGD findings further validate this structural strength, with 54.5% of

students confirming the availability of emergency exits and well-constructed escape pathways, although 45.5% highlighted deficiencies, indicating that despite strong overall compliance, consistency across schools varies considerably.

Security-related infrastructure showed moderately strong implementation but with notable variability between schools. Perimeter fencing recorded a mean of 3.72 (SD = 1.413), and adequate compound lighting scored 3.85 (SD = 1.349), suggesting that most schools have taken significant steps to secure their environments and improve visibility. However, the high standard deviations point to disparities in the adequacy and quality of these installations. Student FGDs reflected similar inconsistencies: while some learners acknowledged well-lit paths and secure compound boundaries, others reported dark walkways, broken fences, or missing gates. These challenges are consistent with regional studies by Karanja and Mugo (2020) and Mwangi (2018), who noted that disparities in physical security infrastructure often stem from unequal school resource levels and differing environmental risks.

Despite strong structural compliance, the implementation of operational emergency preparedness infrastructure is significantly weaker. Functional fire extinguishers scored a modest mean of 3.09 (SD = 1.598), indicating that although many schools possess fire equipment, challenges related to servicing, distribution, and accessibility persist. Principals admitted that some extinguishers are concentrated in administrative areas, not regularly serviced, or outdated a finding consistent with Wachira and Nyamweya (2022), who noted that while Kenyan schools often install fire equipment, they lack the financial capacity to maintain it consistently. The DQASO supported this observation, stating that schools often lack funds to "purchase the required equipment" and sometimes fail to maintain the equipment already installed.

Fire assembly-point implementation was one of the weakest areas. Although the mean stood at 2.96 (SD = 1.628), FGD findings revealed that only 36.4% of students knew where their school's fire assembly point was located, suggesting that assembly points may be unmarked, poorly displayed, or not reinforced through drills. Safety signage recorded the lowest implementation rating at 2.22 (SD = 1.789), indicating widespread absence or inadequacy of directional signs, fire-safety instructions, emergency exit labels, and evacuation maps. Students confirmed minimal signage visibility during FGDs, reflecting global analyses by OECD (2022) and UNESCO (2023), which highlight that signage is among the most neglected safety components in low-resource school environments, despite its affordability and critical importance in evacuation processes.

Qualitative findings from interviews with principals and the DQASO underscore these disparities in infrastructure implementation. While some principals reported having perimeter fences, lighting systems, and basic fire equipment, others acknowledged lacking critical structures such as perimeter walls, functional lighting, and serviced extinguishers. The DQASO further noted that many schools do not fully meet Ministry of Education safety infrastructure standards and added that safety committees responsible for monitoring infrastructure are "not in all schools," weakening ongoing oversight and accountability.

Taken together, the quantitative and qualitative findings reveal a clear pattern in which structural safety compliance is high because these elements are formally inspected, required for registration, and subject to external enforcement. In contrast, operational and functional safety readiness is weak, characterized by inadequate fire equipment maintenance, poorly marked assembly points, limited evacuation signage, and insufficient student and teacher awareness of emergency procedures. Schools in Kipkelion Sub-County therefore appear structurally safe but operationally underprepared. Bridging this gap requires institutionalizing routine safety drills, improving visibility and placement of safety signage, strengthening maintenance and servicing of fire equipment, enhancing communication so that all stakeholders know evacuation routes and assembly points, and ensuring that safety committees are active and consistently oversee infrastructure issues. Without these improvements, schools risk maintaining a façade of compliance while lacking the practical readiness essential for effective emergency response.

Overall, the results paint a picture of schools that have successfully met many regulatory, inspection-driven aspects of safety infrastructure such as structural certification, outward-opening doors, compliant windows but have underinvested in day-to-day operational safety features such as functional fire extinguishers, assembly points, and safety signage. The pattern suggests that schools respond more effectively to areas that are monitored by external authorities, but exhibit weaker performance in areas that rely on internal initiative, resource allocation, and continuous maintenance. These gaps reflect broader trends observed in Kenyan and regional studies, highlighting the need for improved enforcement, training, and funding to strengthen comprehensive school safety systems.

4.1.2 Allocation of financial resources for Safety Activities

The findings in this section highlight the central role of financial capacity in supporting or hindering the

implementation of school safety standards. Overall, the results indicate that while schools recognize the importance of financing for safety, many institutions face significant budgetary constraints that limit their ability to adequately implement and sustain safety initiatives. The results are captured in Table 3 below.

Table 3: Financial Resources and Implementation of School Safety Standards

Item	SDA (1)	DA (2)	N (3)	A (4)	SA (5)	Mean	Std. Dev.
The school provides adequate funds for purchasing and maintaining safety equipment (e.g., fire extinguishers, alarms).	40	48	0	20	28	2.62	1.540
There is a dedicated budget for safety training for teachers and students.	32	30	0	38	36	3.12	1.583
Funds are regularly allocated for emergency drills and preparedness activities.	42	35	40	13	6	2.31	1.139
Safety-related infrastructure (e.g., exits, signage, lighting) receives sufficient financial support.	25	38	40	22	11	2.6765	1.1856
The school relies on external support (e.g., CDF or BOM funds) for safety upgrades.	24	14	0	44	54	3.6618	1.5164

The findings in Table 3 show that although schools recognize the importance of financing for safety improvements, many institutions operate under tight and competing budgetary pressures that significantly limit their ability to implement the Ministry of Education's Safety Standards Guidelines. The statement "The school provides adequate funds for purchasing and maintaining safety equipment" recorded a low mean of **2.62 (SD = 1.540)**, with **65% of respondents disagreeing or strongly disagreeing**. This clearly indicates that essential items such as fire extinguishers, alarms, safety signage, and first-aid supplies are grossly underfunded. These findings corroborate Wachira and Nyamweya (2022), who similarly observed that Kenyan secondary schools often deprioritize safety equipment procurement and maintenance due to competing demands on limited budgets. The FGDs reinforced this reality: more than **70% of students** reported that their schools lacked sufficient resources to implement required safety measures. This convergence strongly mirrors Njeru (2019) and UNESCO (2023), who identify inadequate funding as the single greatest barrier to safety improvements in African schools.

Budgeting for safety training yielded a moderate mean of **3.12 (SD = 1.583)**, but the wide response variability and near-equal levels of agreement, neutrality, and disagreement suggest inconsistent allocation of funds for teacher and student capacity-building. While some schools occasionally allocate funds for workshops, demonstrations, or disaster-management sessions, many do not institutionalize such allocations. The DQASO confirmed that safety planning remains weak because schools frequently fail to ring-fence funds specifically for safety activities, and principals admitted that safety-related training is often overshadowed by more urgent academic or operational needs. This pattern echoes the arguments of

Karanja and Mugo (2020), who found that limited financial capacity persistently undermines school-level safety efforts across Kenya.

Financial support for emergency drills and preparedness activities showed even weaker performance. The mean score of **2.31 (SD = 1.139)** indicates that emergency drills—which are mandated by the Ministry of Education, are rarely planned for, budgeted for, or implemented consistently. This deficit helps explain why **72.7% of students** had never participated in a fire or evacuation drill. This aligns with Wangari (2021), who reported that many schools only conduct drills when externally prompted, such as during inspection visits or after safety incidents. The lack of funding therefore directly affects the frequency and quality of emergency preparedness exercises.

Similarly, the indicator on financial support for safety-related infrastructure recorded a mean of **2.68 (SD = 1.186)**, suggesting insufficient investment in critical infrastructure such as perimeter fencing, lighting, emergency exits, and safety signage. FGDs reinforce this finding: while some students noted that their schools have some emergency infrastructure, many pointed out serious gaps in lighting, exits, and clear directional signage. These deficiencies further demonstrate that infrastructure improvements, though essential, are often postponed or implemented in phases due to financial pressures.

One of the most notable findings relates to schools' reliance on external funding for safety improvements. The statement on reliance on external support such as Constituency Development Fund (CDF), Boards of Management (BOM), NGOs, and donor agencies recorded the highest agreement, with a mean of **3.66 (SD = 1.516)**.

More than 70% of respondents acknowledged that their schools depend heavily on external sources for major safety upgrades. This dependence echoes Mwangi (2018), who documented that infrastructure-intensive safety projects in Kenya are typically financed by external actors rather than by internal school budgets. Principals confirmed that projects such as perimeter fencing, dormitory rehabilitation, alarm installation, and lighting improvements are usually undertaken only when external funding becomes available.

Qualitative evidence from principals and the DQASO further deepens this understanding. The DQASO emphasized that funding for safety is "not sufficient" and that many schools do not systematically integrate safety priorities into their budgets, resulting in a "lack of planning for safety measures." Principals admitted that safety is routinely overshadowed by pressing budget items such as textbooks, examinations, feeding programs, and staffing needs. Without dedicated safety budgets, improvements are often reactive, sporadic, and dependent on financial windfalls.

Taken together, the quantitative and qualitative results point to a consistent and troubling pattern: schools in Kipkelion Sub-County demonstrate a clear willingness to improve safety but lack the financial capacity to do so

sustainably. Underfunding affects every dimension of school safety equipment procurement, infrastructure maintenance, training, signage, and emergency drills. The strong alignment between teacher survey responses, student perceptions, principals' testimonies, and the DQASO's assessment highlights the urgent need to strengthen school funding mechanisms, institutionalize safety-specific budget lines, and reduce the current overreliance on unpredictable external support. Sustainable safety compliance will require predictable, adequate, and ring-fenced financial allocations that allow schools to plan, implement, and maintain safety standards consistently rather than reacting only when external funding or emergencies arise.

4.1.3 Safety Standards Implementation in Public Secondary Schools in Kipkelion Sub-County

This section presents and analyzes the level of safety standards implementation in public secondary schools in Kipkelion Sub-County, drawing on data collected from teachers regarding structural safety, emergency readiness, safety training, availability of safety equipment, and financial support for safety initiatives as presented in table 4.

Table 4: Safety Standards Implementation

Safety Standards Implementation Indicator (DV)	SD	D	A	SA	Mean	Std. Dev
A functional safety committee exists in my school.	52	34	17	33	2.60	1.653
I am familiar with the Ministry of Education's Safety Standards Manual.	28	22	49	37	3.33	1.530
Fire extinguishers are regularly inspected and maintained (operational use).	33	31	35	37	3.09	1.598
Clear assignment of emergency roles (fire marshals, first-aid officers, evacuation leaders).	40	28	34	34	2.96	1.628
Safety signage is adequately displayed in key areas.	50	30	32	24	2.22	1.789
Composite mean					2.84	

The results on the implementation of safety standards, as measured by the five indicators in Table 4 reveal a generally moderate but uneven level of compliance across governance, emergency readiness, and safety communication dimensions in public secondary schools in Kipkelion Sub-County. The composite mean score of **2.84** reflects a moderately low level of implementation, suggesting that although key safety elements are in place, they are not sufficiently institutionalized or consistently applied across schools. The score aligns with indicator-level findings showing that although teachers and administrators generally understand safety requirements, evidenced by relatively strong familiarity with the Ministry of Education's Safety Standards Manual, there are notable

weaknesses in governance structures, routine emergency preparedness, and visual safety communication. The low mean for safety signage, coupled with weak functionality of safety committees and incomplete assignment of emergency roles, significantly pulls down the overall composite score. It highlights that schools possess foundational awareness and occasional implementation of safety measures, but lack the sustained, institutionalized, and systematic safety management practices required for a fully compliant and safe school environment.

Governance-related implementation emerged as notably weak. The existence of a functional safety committee recorded a low mean of **2.60 (SD = 1.653)**, indicating that

in many schools, safety committees—essential governance structures mandated by the Ministry of Education are either absent, inactive, or exist only nominally. This is strongly supported by the DQASO, who confirmed that safety committees are "not in all schools," and by principals who admitted that some committees are constituted only on paper and seldom meet. These governance gaps greatly constrain institutional capacity to coordinate safety activities, enforce standards, conduct drills, and monitor emergency preparedness. This disjuncture between policy expectation and school-level practice mirrors findings by Oduor and Simatwa (2021), who noted that while many schools understand safety requirements, they lack effective governance mechanisms to enforce them.

In contrast, familiarity with the Ministry of Education's **Safety Standards Manual** recorded a relatively high mean of **3.33 (SD = 1.530)**, demonstrating that teachers and administrators possess substantial awareness of official safety requirements. However, the disconnect between this awareness and the poor functionality of safety committees suggests that knowledge of safety standards is not being effectively translated into structured, institutionalized practice. The DQASO captured this tension by noting that safety standards are "not fully implemented in most schools," despite sensitization visits and ongoing guidance.

Emergency operational readiness indicators presented similarly mixed outcomes. **Regular inspection and maintenance of fire extinguishers** registered a moderate mean of **3.09 (SD = 1.598)**. While some respondents affirmed that their extinguishers are inspected and functional, a significant proportion reported the opposite, highlighting inconsistency in maintaining essential emergency equipment. The **assignment of clear emergency roles**—such as fire marshals, first-aid officers, and evacuation leaders—also scored only moderately at **2.96 (SD = 1.628)**. Qualitative evidence from principals revealed that while some schools have designated personnel, roles are often informally understood rather than formally documented, rehearsed, or integrated into routine school planning. This aligns with findings by Wachira and Nyamweya (2022), who observed wide disparities in emergency readiness across Kenyan schools, and with Nyabuti, (2018), who highlighted poor planning and irregular maintenance as systemic challenges.

Safety communication emerged as the weakest dimension of safety standards implementation. **Adequate display of safety signage**, including fire assembly points, exit routes, alarm instructions, and emergency maps recorded the lowest mean of **2.22 (SD = 1.789)**. FGDs confirmed that many students were unable to identify fire assembly points or evacuation routes, reflecting poor visibility and inadequate communication of safety information within the school environment. The SQASO echoed this observation, explaining that schools tend to focus more on structural compliance than on communicative aspects such as signage, evacuation maps, and regular drills. This pattern is consistent with UNESCO (2023), which identifies signage as one of the most neglected indicators of school safety globally, despite its low cost and critical role in evacuation procedures.

Overall, the combined quantitative and qualitative evidence paints a clear picture: safety standards in Kipkelion Sub-County are partially implemented but not fully operationalized.

4.2 Inferential Statistics Results

4.2.1 Correlation Analysis

Influence of provision of safety physical infrastructure on effective safety standards implementation in public Secondary Schools in Kipkelion Sub-County.

This section presents the results of a simple linear regression analysis conducted to examine the extent to which the provision of safety infrastructure (INF) predicts Safety Standards Implementation (SI) in public secondary schools. Safety infrastructure includes core physical facilities such as emergency exits, fire extinguishers, alarms, perimeter fencing, lighting, and safety signage—elements that form the structural foundation of a safe school environment. The purpose of this analysis is to determine whether the adequacy of such infrastructure contributes significantly to the implementation of Ministry of Education safety standards. The model's overall fit, significance level, and coefficient estimates are summarized in Table 5 below.

Table 5: Regression Analysis for Provision of Safety Infrastructure (INF) Predicting Safety Standards Implementation (SI)

Model Summary	R	R Square	Adjusted R Square	Std. Error of the Estimate		
Model 1	.401	.161	.154	6.55002		
ANOVA	**Sum of Squares**	**df**	**Mean Square**		**F**	**Sig.**
Regression	1100.288	1	1100.288		25.646	.000
Residual	5748.976	134	42.903			
Total	6849.265	135				
Coefficients	**Unstandardized B**	**Std. Error**	**Standardized Beta**		**t**	**Sig.**
(Constant)	9.039	1.291	—		7.001	.000
INF	.248	.049	.401		5.064	.000

Dependent Variable: Safety Standards Implementation (SI)

The simple linear regression analysis assessed the extent to which provision of safety infrastructure (INF) predicts Safety Standards Implementation (SI) in public secondary schools. As shown in the Model Summary, the model produced an R value of .401, indicating a moderate positive relationship between the adequacy of safety infrastructure and the level of safety standards implementation. The R Square value of .161 indicates that 16.1% of the variance in SI is explained solely by safety infrastructure, while the remaining 83.9% is influenced by other factors such as teacher training, safety awareness, student preparedness, financial resources, and administrative commitment to safety. The Adjusted R Square (.154) affirms the model's stability and predictive relevance after accounting for sample size.

The ANOVA results confirm that the regression model is statistically significant, with $F(1, 134) = 25.646$ and $p < .001$, demonstrating that INF provides a meaningful improvement in predicting SI compared to a model with no predictors. The Regression Sum of Squares (1100.288) relative to the Residual Sum of Squares (5748.976) reflects the contribution of infrastructure to school safety outcomes, although the majority of the remaining variance is determined by other factors not captured in this model.

The regression coefficients offer further insight into the nature of this relationship. The unstandardized coefficient for INF (B = .248) indicates that a one-unit increase in the provision of safety infrastructure leads to a .248-unit increase in safety standards implementation, holding other factors constant. The standardized beta coefficient (β = .401) shows that INF has a moderate effect size, and the corresponding t-value of 5.064 with $p < .001$ confirms that this effect is statistically significant. The intercept (B = 9.039) suggests that schools maintain a baseline level of safety implementation even when infrastructure provision is minimal, likely due to policy-driven safety requirements and teacher-led practices.

These results are consistent with broader scholarly findings on school safety. UNESCO (2023) emphasizes that availability of essential safety infrastructure, such as fire extinguishers, signage, emergency exits, and perimeter security, creates an enabling environment that enhances preparedness and emergency response. Oduor and Simatwa (2021) likewise reported that schools with adequate safety facilities display better adherence to safety standards compared to institutions where infrastructure gaps remain significant. The moderate effect size in the model aligns with these conclusions by demonstrating that infrastructure plays a supportive but not exclusive role in safety implementation.

At the same time, the R² value (16.1%) underscores the fact that infrastructure alone is insufficient to ensure fully effective safety implementation. This resonates with findings from Karimi and Waweru (2020), who observed that infrastructure must be reinforced by adequate teacher training, regular safety drills, administrative enforcement, and adequate funding to translate into tangible safety outcomes. OECD (2022) similarly argues that while infrastructure forms the physical backbone of safety systems, human and organizational components largely determine how effectively these facilities are utilized. Njeru (2019) adds that schools with good infrastructure often struggle to implement safety standards fully when safety awareness and training are weak, highlighting the importance of integrating infrastructure development with capacity-building programs.

Overall, the findings show that provision of safety infrastructure is a significant and moderately strong predictor of safety standards implementation, contributing meaningfully to safer school environments. However, infrastructure must be supported by teacher empowerment, consistent safety training, adequate financing, and strong school leadership to maximize its impact. The results emphasize the need for holistic safety strategies that combine physical infrastructure with robust human,

institutional, and procedural elements of safety management.

Influence of financial resources provision on effective safety standards implementation in public secondary schools in Kipkelion Sub-County.

This section presents the results of a simple linear regression analysis conducted to determine the extent to which **financial resource allocation (FIN)** predicts **Safety Standards Implementation (SI)** in public secondary schools. Financial resources form the backbone of school safety management because they determine the school's ability to acquire safety equipment, maintain safety infrastructure, finance emergency drills, and support capacity-building for teachers and students. Given the resource constraints prevalent in many public schools, examining the contribution of financial provision to safety implementation is critical. Table 6 below summarizes the model's goodness-of-fit indicators, statistical significance, and coefficient estimates for FIN as a predictor of SI.

Table 6: Regression Analysis for Financial Resource Allocation (FIN) Predicting Safety Standards Implementation (SI)

Model Summary	R	R Square	Adjusted R Square	Std. Error of the Estimate		
Model 1	.354	.125	.119	6.68659		
ANOVA		Sum of Squares	df	Mean Square	F	Sig.
Regression		858.057	1	858.057	19.191	.000
Residual		5991.208	134	44.711		
Total		6849.265	135			
Coefficients	Unstandardized B	Std. Error	Standardized Beta	t	Sig.	
(Constant)	9.643	1.335	—	7.222	.000	
FIN	.354	.081	.354	4.381	.000	

Dependent Variable: Safety Standards Implementation (SI)

The simple linear regression analysis was conducted to assess the extent to which financial resource allocation (FIN) predicts Safety Standards Implementation (SI) in public secondary schools. As shown in the Model Summary, the regression model produced an R value of .354, indicating a weak to moderate positive relationship between financial allocation and the effective implementation of safety standards. The R Square value of .125 demonstrates that 12.5% of the variance in SI is explained by financial resources, while the remaining 87.5% is determined by other factors such as safety awareness, teacher training, infrastructure adequacy, administrative support, and safety culture. The Adjusted R Square (.119) confirms the model's stability and shows that financial resource allocation contributes meaningfully to predicting SI, despite being a single predictor.

The ANOVA results provide further support for the statistical significance of the model. The regression produced an F statistic of 19.191, with p < .001, indicating that FIN significantly improves the prediction of safety standards implementation compared to a model without predictors. The Regression Sum of Squares (858.057) relative to the Residual Sum of Squares (5991.208) illustrates that financial resource allocation accounts for a meaningful, though limited, proportion of the variation in SI. This confirms that financial resources are an important factor in school safety management, though not the sole determinant.

The Coefficients table reveals that financial allocation has a statistically significant and positive effect on SI. The unstandardized coefficient (B = .354) shows that for every one-unit increase in FIN, SI increases by .354 units, holding all other factors constant. The standardized beta coefficient (β = .354) indicates a moderate effect size, and the accompanying t-value of 4.381 with p < .001 confirms that this predictive relationship is statistically robust. The intercept (B = 9.643) suggests that even when financial allocation is minimal, schools still maintain a baseline level of safety implementation, likely because some safety practices are mandated by policy or driven by teacher-led initiatives.

These results are consistent with findings from prior studies emphasizing the foundational role of financial investment in school safety. According to Karimi and Waweru (2020), adequate financial budgeting is essential for acquiring safety equipment, financing teacher training, and maintaining school infrastructure. Similarly, Oduor and Simatwa (2021) reported that schools with higher financial allocations showed significantly better compliance with national safety guidelines due to their

ability to install alarms, purchase fire extinguishers, repair damaged infrastructure, and support safety drills.

International research reinforces these observations. UNESCO (2023) highlights that underfunded schools struggle to implement safety protocols consistently, resulting in gaps in preparedness and emergency response. OECD (2022) also notes that financial constraints are among the biggest barriers to establishing resilient safety systems, especially in resource-constrained countries, where schools often depend heavily on external support such as CDF, NGOs, or BOM allocations. This aligns with earlier findings in your dataset showing that many schools in the study context rely on external funding for safety upgrades.

However, the relatively low R^2 value (12.5%) indicates that while financial resources are important, they are not sufficient on their own to ensure comprehensive safety compliance. This is consistent with literature suggesting that safety implementation also depends on teacher competence, safety culture, administrative enforcement, and the quality of training programs (Wangari, 2021; Njeru, 2019). Financial input enables safety activities to occur, but the effectiveness of these activities depends on how well they are planned, coordinated, and executed at the school level.

5. Conclusion and Recommendations

5.1 Conclusion

The study leads to several key conclusions aligned with the research objectives. Firstly, in regard to the provision of safety physical infrastructure it has a moderate and significant influence on safety standards implementation. Schools have largely complied with structural safety requirements, such as certified buildings and evacuation-friendly designs, but have not adequately implemented operational infrastructure like safety signage, fire assembly points, and consistently functional fire equipment.

Secondly, financial resource allocation is a significant enabler of safety standards implementation but remains insufficient and uneven across schools. The low means for internal funding of safety equipment, drills, training, and infrastructure, alongside the high reliance on external support, indicate systemic underfunding of school safety. The regression results confirm that financial resources significantly predict implementation, but the effect size suggests that finances must be coupled with effective planning, prioritization, and management to yield optimal safety outcomes. Financial resources are thus a necessary

but not standalone condition for effective safety compliance.

Finally, the overall level of safety standards implementation in Kipkelion Sub-County can be characterized as moderate but below desirable levels, with notable strengths in awareness and structural safety, and weaknesses in governance structures, operational preparedness, and safety communication. Safety standards are being implemented to some degree, but not in a consistent, institutionalized, and systematic manner across all schools. The study concludes that an integrated, systems-based approach is required, one that aligns awareness, training, infrastructure, and financial resources within a coherent safety management framework

5.2 Recommendations

1. In relation to safety physical infrastructure, it is recommended that schools consolidate the gains made in structural compliance while urgently addressing operational gaps.
2. Boards of Management and school administrators should prioritize the installation and maintenance of clear, durable, and strategically placed safety signage, the establishment of properly marked fire assembly points, and the regular servicing of fire extinguishers and related equipment.
3. County public works and public health departments should incorporate more detailed safety infrastructure checks into their routine inspections, including verification of signage, escape routes, and assembly points.
4. Future infrastructure development and renovation in schools should be guided by explicit safety design standards, ensuring that safety considerations are integrated into planning and budgeting rather than treated as an afterthought.
5. On financial resource allocation, the study recommends that safety be explicitly recognized as a core budget item in school financial planning.
6. School management should allocate dedicated budget lines to safety equipment, training, drills, and maintenance of safety infrastructure, and should report on these expenditures transparently.
7. While external funding from CDF, NGOs, and community contributions remains important, it should complement rather than substitute internal budgetary commitments.
8. Schools are encouraged to develop medium-term safety improvement plans that guide both internal and external investments toward the most critical safety needs.

5.3 Recommendations for Further Study

Based on the study's findings and limitations, some aspects require further investigation to deepen understanding of safety standards implementation in Kenyan secondary schools. First, future studies should incorporate additional determinants such as school leadership practices, safety culture, teacher workload, and county-level policy enforcement, since these factors likely explain the substantial variance not captured by the current model. Second, researchers should adopt longitudinal designs to track changes in safety implementation over time, enabling stronger causal inferences and evaluation of sustainability of safety interventions.

Third, comparative studies across counties, urban and rural contexts, or public and private schools are recommended to identify context-specific challenges and best practices. Fourth, future research should evaluate the effectiveness of specific safety interventions, including fire drills, first-aid training, ICT-based awareness tools, and community safety partnerships, using experimental or quasi-experimental approaches.

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