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An Audit of Food Safety Standards and Guidelines Implementation in Public Mixed Boarding Secondary Schools in Kenya.

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Abstract

The objective of this paper was to find out the relationship between the implementation of safety standards and guidelines for food safety and student safety in public mixed boarding secondary schools in Nakuru County, Kenya. Invitational Theory and Systems Theory guided the study. The target population included 2130 Form 4 students, 16 principals, 18 deputy principals representing all 16 public mixed boarding secondary schools in Nakuru, Kenya. The study applied a descriptive survey design. A census approach was used. A stratified sampling technique was used in categorising the population into three strata; principals, deputy principals, and Form 4 students. Principals and deputy principals were selected using the purposive sampling technique, while the students were selected using a simple random sampling technique. Questionnaires, interview schedules and observation checklist was used in data collection. Data analysis was performed using tools in the SPSS version 22. The analysis involved computation of descriptive statistics: frequencies and percentages, and inferential statistics: Pearson Correlation. The data was later presented in tables and textually. The study discovered that implementation of Safety Standards and Guidelines for Food Safety has a statistically significant relationship with student safety in public mixed boarding secondary schools in Nakuru County, Kenya. The study recommended that the government to allocate funds to the schools so that adequate food storage facilities can be constructed. The school management should ensure that all the learners with special dietary needs are offered an alternative diet.

Key Terms: Safety Standards and Guidelines for Food Safety, Student Safety, and Public Mixed Boarding Secondary Schools.

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1.0 INTRODUCTION

The student's safety refers to a state in school where students are protected from harmful situations such as substance abuse, contaminated food and injuries. A safe school is a place with no violence and represented by an ecosystem in which its disciplinary procedures exist or no perceived fear of the school. The safety of schools is an essential and fundamental component of the learning process. Creating safe schools where teaching and learning can occur is necessary if the school goals are to be met (Grover, 2015). One of the responsibilities of head teachers is to make sure school resources are efficiently utilised in fostering a caring, secure and safe environment in the school (MOE, 2008). Creating safe schools where teaching and learning can occur is necessary if the school goals are to be met (Grover, 2015).

According to the World Health Organization (2010), food safety is defined as the confidence degree that food will not result to harm or sickness to the consumer when it is prepared, served and consumed according to its intended use. Food safety is an international concern. A considerable proportion of foodborne diseases is owing to unsafe food-handling practices. WHO, reported that these diseases were discovered to affect more than 30 per cent of the population in developed countries. Thus, enhancing the consumer's safety rules knowledge would minimise pathogenic microorganisms in food. Ismail et al. (2016) in Malaysian Primary Schools found out that the school administration should monitor the type of food entering the school to provide security for students. In doing so, schools have prohibited the hawking/vending of food to students in the school compound. The students are therefore required to eat what the school provides. Significant academic interest has been issued in investigating the knowledge and self-reported practices of food safety all over the world. The problem was expected to be even more severe in developing countries like Kenya.

The Safety Standards and Guidelines No.5 in the Safety Standards Manual for schools in Kenya is on food safety. The Standard states that learners in the school should have access to safe and wholesome food for their proper physical and intellectual development. The guidelines further outline a number of measures that ensure school learners' access to safe food. For example, school administration should undertake measures to protect food from rodents, insects, and bacterial contamination. Also, teachers should encourage learners to observe basic hygiene, especially the washing of hands, before and after meals. In a school setup, learners' access and consumption of safe food is essential because wholesome and safe food promotes health and, in turn, effective learning. In addition, research has shown that learners who have access to wholesome and safe food have a more enjoyable and successful learning experience (MOE, 2008).

Despite the Kenya Safety Standards and Guidelines, student safety is still an issue of concern. Could this be a result of the unavailability of effective implementation? The Government of Kenya shows its commitment to the provision of quality education as a basic right entitled to every child. This is enshrined in Kenya's Constitution and stressed in the Vision 2030 (The Kenya sector of the International Commission of Jurists, 2010). However, student safety remains a great concern. For instance, Ayienda (2019) reported a case in Nyabururu High School in Kisii County, where rotting cabbages were quickly buried as parents stormed the school over food poisoning claims.

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Nakuru is one area where not much research has been done on food safety, yet the findings at the Inspection Reports at the County Director of Education Office indicates that cases of lack of food safety are among the causes that have continued to be reported, as shown in Table 1.

Table 1: Number of Cases on Safety Absence in Public Mixed Boarding Secondary Schools

Year	Number of incidences	Incidences
2014	11	Fires in schools, rape cases, coupling, accidents, food poisoning, drugs and substance abuse, congestion, fights, injuries in the field, attempted rape, sexual harassment, pregnancies, strangers in the school compound, attacks by outsiders, poor sanitation, unsafe disposal of sanitary wear, poorly cooked meals, theft, contaminated food, and lack of privacy in girls' sanitation areas.
2015	15	
2016	22	
2017	28	
2018	39	
2019	52	

Source: Inspection Reports, Nakuru County Education Office (2019).

This study investigated the relationship between the implementation of safety standards and guidelines for food safety and safety of the student in public mixed boarding secondary schools in Nakuru County, Kenya. There is a worrisome increasing trend on the safety of food consumed by the students. This is despite the introduction of the Safety Standards and Guidelines to be used in schools. According to Table 1, incidences of lack of safety have continued to be reported from 2014-2019. However, despite a decade of school Standards and Safety Manual, the UWEZO (2015) report posits that Kenyan schools, including Nakuru, are a distance away from attaining safety standards (Kang'ethe & Cierra, 2017). Therefore, this indicates that the learners' safety in schools in Nakuru County may not be a guarantee. Still, lack of safety in school can result in psychological stress, physical injuries and emotional stress.

2.0 LITERATURE REVIEW

The Concept of Student Safety

In South Africa, provision is made for protecting the children's rights and the learners' safety in the Domestic Violence Act, 1998 (Act 116 of 1998); the Child Care Act, 1983 (Act 74 of 1983); the South African Schools Act, 1996 (Act 84 of 1996), and The Occupational Health and Safety Act, 1993 (Act 85 of 1993). To a larger extent, these Acts are all concerned with protecting learners' physical and psychological integrity in South African schools. However, according to Nthate (2017), violence and crime violence has become a normal feature of many schools in South Africa. Incidents are normally captured on social media when videos go viral. Individual incidents grab headlines, condemnation and spark outrage, but what are the underlying causes of school violence and what should be done to ensure that schools should be safe havens? This, therefore, depicts that the problem of

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student safety could still be a hurdle in schools of South Africa students despite various Acts put in place in addressing safety matters.

In Kenya, the schools' Safety Standards Manual was developed in the year 2008 following experiencing unprecedented insecurity, leading to the internal displacement of over 300,000 people and school children the most be (Safety Standards Manual, 2008). The Safety Standards and Guidelines were prepared amongst the recurrent cases of child abuse reported across the country. Experiences gained from the pilot phase enabled the country to develop this Safety Standards Manual for application nationwide. The Manual captures various aspects of student safety such as the benefits of school safety, threats to school safety, the importance of safe grounds, indicators of school safety, organisation of the School Safety Programme, Safety Standards and Guidelines and lastly, Monitoring and Evaluation of the School Safety Programme. The Safety Standards and Guidelines address thirteen safety concerns within the school. These are safe on school grounds, safety in physical infrastructure, health and hygiene safety, safety in the school environment, food safety, protection against drug and substance abuse, teaching and learning environment, socio-cultural environment of the school, the safety of children with special needs, safety against child abuse, transportation safety, disaster risk reduction and lastly school community relations.

Despite the Safety Guidelines and Standards in Kenya, student safety is still a matter of concern. Could this be due to effective implementation deficiency? The Government of Kenya shows its commitment to the provision of quality education as a basic right entitled to every child. This is enshrined in Kenya's Constitution and stressed in the Vision 2030 (The Kenya sector of the International Commission of Jurists, 2010). However, student safety remains a great concern. For instance, in the year 2012, eight pupils from Asumbi Girls' Boarding Primary School in Homa Bay County were burnt to death (Oduor & Omoro, 2012). More so, unsafe schools disrupt learning, destruction of resources and worst of all, lives are lost hence placing head teachers in the spotlight (Kirui et al., 2011). However, some schools have not put in place safety measures in secondary schools, and none have developed a safety policy implementation framework (Kemunto et al., 2012). As a result, it is clear that students may not be fully safe in some schools, and this figures doubts on the level of Safety Standards and Guidelines implementation.

Safety Standards and Guidelines for Food Safety and Student Safety

The food safety concept refers to access and consumption of wholesome food promoting good health and optimal body functioning. Learners' access and consumption of safe food is important because safe and wholesome food promotes health and effective learning. Research has depicted that learners with access to wholesome (safe) food have a more enjoyable and successful learning experience (MOE, 2008). Various schools have used many ways to ensure learners access food while in school. In some cases, schools have a shop to sell loaves of bread, toothpaste and other necessities to students and are fully managed by the school (Mwenga, 2011). The school should further only be supplied with food commodities by trusted and vetted suppliers. In so doing, the school is able to monitor what the students eat while in school (Makau, 2016). A school that strictly

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regulates the type of food entering into the school is able to assure students of their safety in regard to food security. It is clear from the study that compliance to set Safety Standards and Guidelines translates into improved student safety. However, the same could not be stated with respect to public mixed boarding secondary schools in Nakuru County, for limited studies have been done. This current study thus was to provide the relevant answers.

Shaghaghian et al. (2016) found that hygiene is a very important aspect in ensuring the safety of foods. From time to time, teachers encourage students to maintain high levels of hygiene by ensuring that they wash their hands before and after taking meals. Some of the hygienic considerations that students are encouraged to practice include; washing hands with soap before and after having meals, washing their utensils, keeping them in clean places, and avoiding storing food in their classes or dormitories (Ali & Fatima, 2016). In light of student hygiene, schools may once in a while conduct inspections of the level of cleanliness of students and how they handle food to ensure that there is a high degree of hygiene among the students. In the event of a diseases outbreak, a school whose students do not observe a high standard of hygiene suffers the most (Ogonyo, 2012). Therefore, this study was undertaken in public mixed secondary boarding schools in Nakuru County to find out if the existing Safety Standards and Guidelines for food safety had a relationship with student safety.

People handling food and mandated to serve food to students are key determinants of food security in the school. This personnel need to be sensitised to observe personal cleanliness in executing their duties (Ali & Fatima, 2016). This is because food can be stored and prepared well by observing all hygienic aspects but get contaminated at the last stage of serving the students (Shaghaghian et al., 2016). The school administration should make sure that the people who are supposed to serve students are clean and observe a high standard of hygiene. This can be done by ensuring their personal level of cleanliness is high and that they wash their hands before serving the food (Cowan et al., 2013). The team should wear a clean uniform and ensure that their heads are covered. When this is observed, the school is able to attain a safe environment for students in regard to the safety of students against food-related infections and diseases (Mburu, 2012). The unanswered question is if guidelines for food safety spelt out in the 2008 Safety Standards Manual had improved the level of food safety for students.

Avoiding the spread of bacteria when buying, storing and preparing food ensures that food is safe from foodborne illness. This threatens the safety of students in regard to the food they take to school. Schools buy food in bulk and store it in storage facilities for future consumption. The storage facility should be enough in size and number to accommodate all the food to be stored in the school (Bachman et al., 2011). When the storage facilities are inadequate, it will imply that all food will not be safely stored for student consumption. Safety Standards and Guidelines for Food encourage food to be stored in three types of food facilities, namely; Perishable foods storage, Semi-perishable foods storage and Staple, or non-perishable foods storage (Mburu, 2012). The classification is guided by the perishability of food and safety requirements such a temperature and

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moisture level (Cowan et al., 2013). Storage for perishable goods should contain foods like meat, milk, vegetables and fruits. This storage should contain a refrigerator.

Ugwulashi (2016), from a Nigerian context, emphasises that facilities for storing semi-perishable foods should contain flour and dried products. On the other hand, staple or non-perishable foods storage facilities should contain sugar, cereals, spices, and canned goods. In some schools, food has been stored in classrooms due to a lack of adequate food storage facilities and therefore is at risk of contamination (Shaghaghian et al., 2016). The challenge of food storage needed to be explored in the context of public mixed boarding schools in Nakuru County, especially in the context of laid down Safety Standards and Guidelines provided by the Ministry of Education.

Krezmien et al. (2010) study in the United States of America observed that schools rely on suppliers to supply most of the food products to the school. In ensuring the security of food consumed by the students, the school must make sure that the food it purchases for students is in good condition, fresh and safe for human consumption. Therefore, schools may put measures to monitor the quality of food that is supplied to the school. One of the measures is to vet the food suppliers and also inspect the food that has already been supplied to the school by the suppliers (Ugwulashi, 2016). In addition, there is a renewal of contracts and terms of reference to improve the quality of food supplied (Ali & Fatima, 2016). Further, from time to time, the school administration appraises the performance of the suppliers to ensure they perform according to the requirements and expectations of the school (Grover, 2015). This helps to ensure that there is food security in terms of the condition and safety of food for human consumption. Therefore, contextualisation of such food safety research to Nakuru County was necessary considering limited studies exist that investigate the influence of implementation of the guidelines on student safety.

In the storage facility, food should be kept to ensure that the food is free from infections by bacterial and attack by rodents. For perishable foods, the school should ensure that there is a refrigerator to keep such foods like meat, milk and vegetables (Tallo, 2014). For non-perishable food such as sugar and cereals, the school should ensure that the food is kept in a proper condition free from water and attack by rodents. The school may carry out cereal and grain treatment from time to time to keep them free from attack by rodents and insects (Ngara & Magwa, 2015). In some cases, the school administration seeks assistance from public health officers. If food in the school storage facility is affected by rodents, insects and bacterial contamination, then the food is not safe to be consumed by humans and therefore unsafe for students (Siochaet al., 2016)

Food safety should be observed during food preparation. The level of cleanliness of tables where food is chopped or cut as well as the utensils used for such purposes is essential in determining the level of food safety (Kemunto, Role, & Balyage, 2012). The entire kitchen or the places in which food is cooked should observe high levels of hygiene. The staff preparing food for students needs to observe a high standard of hygiene. From time to time, school administration is expected to inspect the preparation of food to ensure that it adheres to Food

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Safety Guidelines (Mutua, 2016). Employing qualified staff to cook for students has been seen as a measure of ensuring food safety for students in the school (Cowan et al., 2013). A school that has qualified staff to cook for students and makes sure the food preparation process adheres to safety requirements provides a safe environment for students in regard to food safety (Russell, 2011).

Most of the schools prepare food and have it ready some hours to the time that students take their meals. By the time the students are served their meal, the food might have gotten cold (Siocha et al., 2016). Cold food may freeze up students' stomachs creating a blockage and thus poor absorption of nutrients by body tissues. This may result in indigestion problems and therefore lead to illness among the students. Cold food also harbours bacterial infections, and this can result in diseases to the students (Kemunto et al., 2015). Therefore, a school is supposed to ensure that the food consumed by students is hot to prevent such cases. By making this arrangement, among other considerations, the school can be termed as safe for students regarding the quality of food served to the students (Gatua, 2015).

Some students may have health conditions that do not allow them to consume the food that is prepared in the school. At the point of admission into the school, schools seek to establish whether students being admitted have any special dietary needs (Siocha et al., 2016). In light of this, the school makes an arrangement to ensure that such students have their needs catered for in relation to dietary needs (Ngara & Magwa, 2015). Special foods are prepared for such students in order to ensure food safety for such students. If students with special needs are not catered for in relation to dietary needs, such students may experience health problems (Kemunto et al., 2015). In such situations, a school cannot assure students of their safety in regard to the food they consume.

Evidence of unsafe food for students is seen in the reaction of students after consuming the food. If the food is not safe to be consumed, the students will experience discomfort after eating the food. Some students may develop allergies to eating certain foods (Ngara & Magwa, 2015). The school administration should ensure that students displaying frequent discomforts after eating food are referred to medical personnel for tests on allergies. The problem will be established and a corrective measure taken (Kemunto et al., 2012). From the checks, the student may be advised to avoid certain types of foods, or the school advised to ensure that the food is safe for human consumption depending on the results of the medical check-ups. Suppose a school ensures that every student who experiences medical problems due to food consumption provided in the school is taken for medical tests and medication. In that case, such a school is safe for students in terms of medical care (Siocha et al., 2016).

According to Wayong'o (2018), in Kenya majority of schools do not have a water source within the school compound, and even those with water actually do not have it throughout the year. This means adherence to recommended hygiene standards and food safety measures is not guaranteed. More so, the Uwezo (2014) findings show that 46 per cent of schools in Kenya do not have the MoE School Safety Manual, with only 40 per cent having an operational School Safety Committee as stipulated in the manual. In addition, only 4 per cent of

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schools in Kenya have a functional fire extinguisher, with 45 per cent of schools having an operational guidance and counselling room. However, the influence of such omissions on student safety in public mixed boarding schools in Nakuru County was yet to be explored.

School hygiene is another vital factor that determines pupils' health and attendance. For example, when a child contacts diarrhoea which is transmitted through the contaminated water, they end up missing schools for several days resulting in poor performance. Uwezo (2014) findings indicate that although 8 in 10 (79 per cent) of the schools have piped water, only half of that (36 per cent) had a functional hand washing facility near the toilet with water and soap. One would justifiably ask if the water availability is not the problem, what then makes it so challenging to construct water points near the toilets to improve student hygiene.

3.0 RESULTS AND DISCUSSION

Respondents response rate

The study was able to acquire a response from 275 students, translating to 93.54%; the response rate from interview schedules was: for principals (92.86%), and for the deputy principals had (100%). This was sufficient to ensure the researcher developed reliable conclusions and recommendations. In addition, Nulty (2008) reports that the acceptable response rate for on-paper surveys is 75 per cent. Therefore, the acquired percentage was good and acceptable to the researcher.

General feature of the respondents

The results show that 51.27 per cent of the respondents were males while 48.73 per cent were female. This suggested that both genders were represented equally in the study, and thus the researcher was able to capture both perspectives. The collection of data from both genders enabled the researcher to understand the gender-specific safety needs. The results state that the student's distribution in each school category was as follows: Sub County (45.45%), County (30.55%) and Extra County (24.0%). This gave the researcher a chance to receive a fair representation of the students per school category.

Implementation of Safety Standards and Guidelines for Food Safety and student safety

Consumption of fresh food

The results in Table 2 show that 25.6 per cent of the students in sub-county schools, 79.6 per cent of those in county schools, and 57.5 per cent of those in extra county schools agreed that food consumed at their school is fresh. However, the results also show that 74.4 per cent of the students are in sub-county schools, 20.4 per cent are in county schools, and 42.5 per cent are in extra county schools. This implied that the majority of the schools in the sub-county schools' category had failed to ensure that students in their schools consumed fresh food. The results suggest there are unaddressed concerns regarding the quality of food consumed in all the schools, but the problem presents much in sub-county schools. If the students consume food that is not fresh, it will result in ailments and even food poisoning.

The findings could explain the increasing incidences concerning food like food poisoning as recorded in the Inspection Reports at the County Director of Education office in Nakuru. However, on being asked about the state food consumed by learners, one deputy principal was reported saying, “We do our best to provide our students with fresh food.” The results are correspondent to those in a study by Serrem et al., (2020), where it was found that many schools were not providing students with fresh food. The researchers also observed that the majority of the Kenyan high schools studied do not provide nutritionally adequate meals.

Table 2: Consumption of Fresh Food

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
Food consumed is fresh	Strongly disagree	12	30.0%	2	4.2%	8	9.3%
	Disagree	5	12.5%	8	16.7%	56	65.1%
	Agree	15	37.5%	30	62.5%	13	15.1%
	Strongly agree	8	20.0%	8	16.7%	9	10.5%

Personal Cleanliness of Food handling Personnel

The outcomes presented in Table 3 revealed that 38.2 per cent of the students in sub-county schools, 71.8 per cent of those in county schools, and 83.3 per cent of those in extra county schools agreed that personnel mandated to serve food observed personal cleanliness, while the rest of the students disagreed. The implication was that cleanliness was observed by personnel mandated to serve food, and thus limiting the element of health risk associated with lack of cleanliness, such as food contamination. However, this was not the case with sub-county schools, where according to most of the students (51%), the food handling personnel did not observe cleanliness as expected by the students. This posed the risk of such personnel contaminating the food to be consumed, leading to diseases such as typhoid and cholera. The results are correspondent to those in a study by Mwenga (2011), where it was revealed that in the majority of the schools, Kitchen staff did not observe personal cleanliness, and in fact, most of them are neither trained nor have medical certificates requisite for handling food.

Table 3: Personal Cleanliness of Food handling Personnel

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
Personnel mandated to serve food observe personal cleanliness	Strongly disagree	6	9.1%	6	7.7%	17	13.0%
	Disagree	6	9.1%	16	20.5%	64	48.9%
	Agree	47	72.7%	38	48.7%	39	29.8%
	Strongly agree	7	10.6%	18	23.1%	11	8.4%

Illegal Hawking of Food in School

The findings presented in Table 4 indicated that 52.7 per cent of the students in sub-county schools, 100 per cent of those in county schools, and 80.3 per cent of those in extra county schools agreed that there is no illegal

hawking of food to students in the school compound. The results suggest that the school management of most of the schools in Extra County and all county schools had ensured that there was no illegal hawking of food to students in the school compound. However, over 40 per cent of the sub-county mixed boarding secondary schools were not keen on controlling illegal hawking in schools. On being asked whether the school had recorded any incidences of illegal hawking, one principal is reported saying, “Yes, we had an incident two years ago, and we suspended the cook, who would bring foodstuffs to the students”. The Safety Standards Manual prohibits illegal hawking or vending of food to school children in the school compound, or its vicinity is since the safety of such food cannot be guaranteed. This practice may expose learners to contaminated food, and illegal substances such as drugs and alcohol may get their way to the schools. In fact, illegally hawked food may be poorly handled or stale, and this could lead to food poisoning. The results agree with those in a survey by Mutua (2017), where it was observed that illegal hawking of food to students in the school compound was not allowed in most schools.

Table 4: Illegal Hawking of Food

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
There is no Illegal hawking of food to students in the school compound	Strongly disagree	8	12.1%	0	0.0%	4	3.1%
	Disagree	5	7.6%	0	0.0%	58	44.3%
	Agree	20	30.3%	24	30.8%	27	20.6%
	Strongly agree	33	50.0%	54	69.2%	42	32.1%

Condition of Food Purchases

The results presented in Table 5 show that 51.9 per cent of the students in sub-county schools, 66.6 per cent of those in county schools, and 65.1 per cent of those in extra county schools agreed that food was purchased for students in their school is in good condition. This implied that even though the management ensured that food purchased for the students was in good condition in most of the schools, it is essential to note that over 30% of the students in all three categories felt that food purchased was in poor condition. Food in bad conditions could make the learners lose appetite, fail to gain the nutrients from the food and even contract diseases such as typhoid. This could explain the increasing incidences concerning food. The findings affirm those in a survey by Mbula (2019), who observed that the condition of food purchased for learners was wanting in some schools. Mbula noted that students had been in and out of the hospital over suspected food poisoning in one school. The students complained of severe stomach pains, dizziness while others had vomited or suffered diarrhoea.

Table 5: Condition of Food Purchases

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
Food purchased for students is in good condition	Strongly disagree	10	15.2%	10	12.8%	8	6.1%
	Disagree	13	19.7%	16	20.5%	55	42.0%
	Agree	23	34.8%	26	33.3%	31	23.7%
	Strongly agree	20	30.3%	26	33.3%	37	28.2%

Contamination of Food by Insects

The results in Table 6 show that 42.8 per cent of the students in sub-county schools, 38.5% of those in county schools, and 34.8 per cent of those in extra county schools agreed that food consumed had not been contaminated in any way by insects. These low percentages across the responses from students in all the three school categories indicate that students were consuming food already contaminated by insects in most schools. When the learners consume food that insects have contaminated, they spend much of their time picking out the insects instead of enjoying the meal; some lose appetite and most importantly, the food consumed lacks all the nutritional components. On being asked about the school's measure to ensure that insects do not contaminate the food, one of the deputies is quoted saying, “we dry the cereals and treat them using chemicals, but it is difficult to treat over 100 bags of maize and beans”.

This could justify the increasing food-related cases like food poisoning in public mixed boarding secondary schools. Similarly, in a study by Richards (2020), it was observed that retail food settings such as food stores in schools might experience a wider variety of pests, such as ants, cockroaches, flies and rodents. Food contamination can happen at any stage in the food distribution, and processing cycle and pest management professionals can help protect the consumer's health at every stage. Richards reported that flies and cockroaches could transmit bacteria mechanically, such as Salmonella, Staphylococcus aureus, Listeria and Escherichia coli that can result in food-borne illnesses. These types of illnesses can result in diarrhoea, gastrointestinal pain, cramping and fever.

Table 6: Contamination of Food by Insects

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
Food consumed have not been contaminated in any way by insects	Strongly disagree	27	40.9%	26	33.3%	14	10.7%
	Disagree	16	24.2%	22	28.2%	61	46.6%
	Agree	15	22.7%	24	30.8%	34	26.0%
	Strongly agree	8	12.1%	6	7.7%	22	16.8%

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Cleanliness in the Food Preparation areas

The results provided in Table 7 show that 46.6% of the students in sub-county schools, 48.7% of those in county schools, and 50% of those in extra county schools agreed that areas where food is prepared, including tables where food is chopped, are clean. On the contrary, the results also show that 53.4% of the students in sub-county schools, 51.3% of those in county schools, and 50% of those in extra county schools indicated that the places where food is chopped are not clean. The results suggest that many students believed that areas where food is prepared, including tables where food is chopped, are not clean, which compromised food safety in their schools. The situation was much worse in sub-county schools. The study findings agree with those in Ngere (2010), who established that most of the schools did not observe cleanliness in areas where food is prepared, including tables where food is prepared.

Table 7: Cleanliness in the Food Preparation areas

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
Areas for food preparation include tables where food is chopped, are clean	Strongly disagree	28	42.4%	22	28.2%	19	14.5%
	Disagree	5	7.6%	18	23.1%	51	38.9%
	Agree	19	28.8%	28	35.9%	39	29.8%
	Strongly agree	14	21.2%	10	12.8%	22	16.8%

Cleanliness of the Areas where food is chopped or cut

The findings in Table 7 concurs with the findings from the observation list in Table 8, which noted that in most of the schools (57.1%), the areas where food is chopped or cut are not clean. When these areas are not clean, they can contaminate the food served to the students. The results concur with those in a study by Mwangi et al. (2018), who reported that many food handlers failed to adhere to the basic hygiene of food and food preparation areas, which compromised food safety.

Table 8: Cleanliness of the Areas where food is chopped or cut

Response	Frequency	Percentage
Yes	6	42.9%
No	8	57.1%
Total	14	100.0%

Provision of one Hot Meal at Least per Day

The results provided in Table 9 show that 85.5 per cent of the students in sub-county schools, 97.4 per cent of those in county schools, and 83.3 per cent of those in extra county schools agreed that learners are provided with at least one hot meal per day. The results suggest that according to the majority of the respondents, the students in their respective schools are issued with at least one hot meal per day. The results from the interview schedule also indicated that learners are provided with at least one meal per day. A deputy stated as follows:

“Yes, we ensure that the learners get at least one hot meal per day. This is our school policy”. The guidelines direct that the school authorities, in collaboration with parents and members of the community as well as well-wishers, should be motivated to ensure that learners are issued with a hot meal daily. This will not only promote retention but also improve learning. The findings resonate with a study by Aliyar et al. (2012), who established that in the majority of the schools in Kenya, learners are provided with at least one hot meal per day. The researchers, however, observed that the Kenyan MoE had not specified a menu or ration composition of its own rather, it has adopted the World Food Program (WFP)’s daily hot lunch ration.

Table 9: Provision of at least one hot Meal per Day

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
Learners are provided with at least one hot meal per day	Strongly disagree	7	10.6%	0	0.0%	6	4.6%
	Disagree	4	6.1%	2	2.6%	13	9.9%
	Agree	33	50.0%	34	43.6%	48	36.6%
	Strongly agree	22	33.3%	42	53.8%	64	48.9%

Catering for the Dietary needs of Learners with Special Needs

It was found, as shown in Table 10, that 78.7 per cent of the students in sub-county schools, 84.6 per cent of those in county schools, and 57.8 per cent of those in extra county schools agreed that learners with special needs are catered for in relation to dietary needs, while the rest disagreed. The results suggest that even though in most of the schools, learners with special needs are catered for in relation to dietary needs, this was not the case in some schools. There seem to be unaddressed concerns in extra county schools, with over 30 per cent of students indicating that learners with special needs are not catered for in relation to dietary needs. The guidelines state that the school should make efforts to ensure that learners with special needs are properly catered for in relation to dietary needs. However, when the learners consume food that they are uncomfortable with, they might become sick; get allergic reactions, among other effects. The findings are contrary to those in a study by Meresman and Drake (2016), who established that many schools did not have adequate food resources to cater to learners' dietary needs, as this came with extra costs.

Table 10: Catering for the Dietary needs of Learners with Special Needs

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
Learners with special needs are catered for in relation to dietary needs	Strongly disagree	25	39.1%	4	5.1%	12	9.2%
	Disagree	2	3.1%	8	10.3%	16	12.2%
	Agree	13	20.3%	26	33.3%	53	40.5%
	Strongly agree	24	37.5%	40	51.3%	50	38.2%

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Referral of Students displaying frequent Discomforts after eating Food

The results in Table 11 show that 50.3 per cent of the students in sub-county schools, 61.6% of those in county schools, and 53.1 per cent of those in extra county schools agreed that there were cases where students displaying frequent discomforts after eating food were referred to medical personnel for tests on allergies. The results also show that 49.7 per cent of the students in sub-county schools, 38.4 per cent of those in county schools, and 46.9 per cent of those in extra county schools indicated that there are cases where students who display frequent discomforts after eating food are referred to medical personnel for tests on allergies. The results suggest that students displayed frequent discomforts after eating food in many schools and then referred to medical personnel for tests on allergies. On being asked what happened to the students who openly displayed discomfort after eating food, one of the deputy principals is reported saying. “If you give students leeway, all of them would want a special diet. This would be expensive for the school.” The results are in agreement with a study by Uçar et al. (2016), who observed that students who consumed contaminated food displayed frequent discomforts after eating the food. Uçar explained that contamination of the food at any stage, from production to consumption, produces bacteria, viruses, parasites, chemical agents and toxins, which eventually cause the foodborne diseases.

Table 11: Referral of Students displaying frequent Discomforts after eating Food

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
Students displaying frequent discomforts after eating food are referred to medical personnel for tests on allergies	Strongly disagree	23	35.9%	12	15.4%	37	28.2%
	Disagree	7	10.9%	18	23.1%	28	21.4%
	Agree	19	29.7%	30	38.5%	29	22.1%
	Strongly agree	15	23.4%	18	23.1%	37	28.2%

What is done to Students who Display Frequent Discomforts after Eating Food in School

The results from the principals and deputy principals through interview schedules show that several actions were taken to deal with students who display regular/frequent discomforts after eating food in school. Such measures included the use of a sanitarium clinic and the utilisation of nursing and a dispensary nearby. One of the principals indicated, “We usually ask for a medical report from the doctor, and the school will offer what is recommended by the doctor”. There was also a mention of some learners being put on a special diet as recommended by qualified doctors. The findings are in agreement with Mberia et al. (2017), who observed that secondary schools studied were keen on ensuring that learners with dietary needs were placed under the recommended diet doctors.

Measures that have been set to Cater for Students with Special Needs

The principals and deputy principals, through an interview schedule, indicated that there are measures the schools have put in place to cater for students with special dietary needs. The measures adopted include:

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offering a special diet or alternative diet as recommended and ensuring students visit medical facilities in time. Some school principals indicated that they asked parents to pay for the alternative diet. The Safety Standards and Guidelines recommend that schools should make efforts to ensure that learners with special needs are catered for in relation to dietary needs. The essence of a special diet or alternative diet in schools was emphasised in a study by Veloudaki et al. (2019) as a sure way of ensuring food safety in learning institutions. The healthy meals distribution to the students was seen to be very beneficial in terms of food insecurity reduction and improving students' eating habits, reducing childhood obesity, and improving the students' behaviour in school.

Basic Hygiene the Schools Encourage Learners to Observe in School.

The principals and deputy principals, through the interview schedules, indicated that the schools' basic hygiene that it encouraged learners to observe in their school included washing of hands in designated places, washing utensils immediately after finishing their meals, washing hands after toilet, and ensuring there is water. On being asked the basic hygiene that the school encouraged learners to observe, one deputy principal was reported saying, "We advise them to wash their hands before and after taking meals and also every time they visit the toilet" The Safety Standards and Guidelines recommend that teachers should encourage learners to observe basic hygiene like washing of hands before and after meals. According to a study by Mane and Tata (2017), handwashing is an effective way to prevent the spread of common school illnesses like cold, pink eye, flu, and much more. Therefore, teaching children handwashing is important to keep them clean and healthy. Handwashing with soap is essential for students to improve health and prevent diseases (e.g., diarrhoea and gastrointestinal infections).

Measures to Protect Food from Rodents, Insects and Bacterial Contamination

The results from interview schedules with respect to the measures that the school has put in place to protect food from rodents, insects and bacterial contamination revealed the following: Confirming the state of food before storage such as the expiring date, using modern kitchens, proper drying and traps for rodents, treatment of the grains, and ensuring that food lasts for a term. Toma et al. (2020) observe that checking the expiry date for food items before consumption helps one to avoid consuming unsafe foods that can cause sickness. The frequency of checking date labels when shopping and preparing meals is a behaviour that should be adopted in schools. Kaleta and Górnicki (2013) mention that it is safe to treat grains so that the food remains fit for human consumption.

Adequate Storage Facility

The results from the observation checklist provided in Table 12 revealed that all the schools (100%) had inadequate storage facilities for food items. The food items were congested in small stores, old classrooms, corridors and others in school kitchens. On being asked if the school had an adequate storage facility, one of the principals is reported saying: "Building a store is very expensive. What we are focusing on now due to a 100% transition policy is to build more classes and dormitories; as you may have seen; we keep our grains in a corner in

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the dining hall” Poor storage of the foodstuffs could cause contamination and even attacks by rodents. Kaleta and Górnicki (2013) point out that adequate storage facility is a requirement for ensuring that the food available is safe for consumption over a long period of time.

Table 12: Adequate storage facility

Response	Frequency	Percentage
No	14	100

Alternative Sources of Food Available to Students in School and if they are Certified Sources

According to the principals and deputy principals, the interview schedule showed that other alternative sources of food are available to students in schools. Supplies by parents, in some schools most foodstuff is grown in the school. The suppliers were vetted through a vetting committee recommended by the Ministry of Education. The respondents confirmed that all the sources were certified as per the Safety Standards Manual. One of the deputy principals is reported saying, “We have a school canteen, where we have stocked various food items that the students can purchase”. Adelman et al. (2008) observed that the presence of alternative sources in school helped boost the nutrition intake of learners.

Rating of Student Safety with Regard to Safety Standards and Guidelines for Food Safety.

The results in Table 13 show that 42.8 per cent of the students in sub-county schools, 64.1 per cent of those in county schools, and 64 per cent of those in extra county schools described safety against contaminated food as safe, while the rest described this aspect as unsafe. This implied, according to most students, their school protected them from consuming contaminated food. However, given over 30 per cent of the participating students indicated that it was not safe, thus implying that consumption of contaminated food is still a challenge in the schools and needs to be addressed.

The results also reveal that 41.1 per cent of the students in sub-county schools, 56.5 per cent of those in county schools, and 54.7 per cent of those in extra county schools described safety from taking food the student is allergic to, while the remaining respondents indicated that it was unsafe. The results suggest that the school management ignored the risks associated with students taking food they are allergic in many schools.

However, one principal is quoted stating: “They are just a few isolated cases of stomach-aches; there is nothing so serious. In some cases when we investigate, we realise they are just pretending, especially during examinations time.” This situation presented heavily in the sub-county schools, with a percentage of over 50 per cent of the respondents indicating that it is unsafe.

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Table 13: Rating of Student Safety with respect to Safety Standards and Guidelines for Food Safety

		Category of the School					
		Extra County		County		Sub County	
		F	%	F	%	F	%
Safety against contaminated food	Very Unsafe	13	20.3%	12	15.4%	13	9.9%
	Unsafe	10	15.6%	16	20.5%	62	47.3%
	Safe	23	35.9%	26	33.3%	31	23.7%
	Very Safe	18	28.1%	24	30.8%	25	19.1%
Safety from taking food you are allergic to	Very Unsafe	25	39.1%	14	17.9%	19	14.7%
	Unsafe	4	6.3%	20	25.6%	57	44.2%
	Safe	18	28.1%	36	46.2%	23	17.8%
	Very Safe	17	26.6%	8	10.3%	30	23.3%

Correlation between the implementation of safety standards and guidelines for food safety and student safety.

The findings in Table 14 show that there was a positive Pearson correlation between Implementation of Safety Standards and Guidelines for Food Safety and Student Safety as follows: ($r = 0.126^*$, $p = 0.037$). This indicates that there was an association between the Implementation of Safety Standards and Guidelines for Food Safety and Student Safety. Given that the p-value (0.037) was less than the test significance level ($p < 0.05$), this relationship is statistically significant.

Table 14: Correlations between implementation of safety standards and guidelines for food safety and student safety

		Safety Standards and Guidelines for Food Safety on student safety	Student Safety
Safety Standards and Guidelines for Food Safety and student safety	Pearson Correlation	1	.126*
	Sig. (2-tailed)		.037
	N	275	275
Student Safety	Pearson Correlation	.126*	1
	Sig. (2-tailed)	.037	
	N	275	275

*. Correlation is significant at the 0.05 level (2-tailed).

Test of Hypothesis

The fourth hypothesis read, “ H_0 : There is no statistically significant relationship between implementation of Safety Standards and Guidelines for Food Safety, and student safety in public mixed boarding secondary schools in Nakuru County, Kenya.” The beta value was 0.133. Since the p-value associated with capital adequacy was 0.027, a value less than 0.05 ($p < 0.05$), there is a rejection of the null hypothesis, and therefore, it can be argued that implementation of Safety Standards and Guidelines for Food Safety has a significant relationship with the safety of the student in public mixed boarding secondary schools, in the county. Therefore, rejecting the null

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hypothesis means that the implementation of Safety Standards and Guidelines for Food Safety contributes positively to student safety in schools.

The results imply that in the majority of the schools, Safety Standards and Guidelines for Food Safety were properly implemented, that they contributed positively to the state of student safety. From the findings, it is clear that contributory factors included the fact that most schools' management made sure that food consumed in school is fresh, personnel mandated to serve food observe personal cleanliness, and there is no illegal hawking of food to students in the school compound. However, the majority of the schools failed to ensure that food consumed has not been contaminated in any way by insects, areas where food is prepared, including tables where food is chopped, are clean, and that learners with special needs are catered for in relation to dietary needs. However, it is critical to take into account that this effect was not observed in all public mixed boarding secondary schools in Nakuru County.

4.0 CONCLUSION AND RECOMMENDATIONS

Conclusion: The study discovered that implementation of Safety Standards and Guidelines for Food Safety has a statistically significant relationship with student safety in public mixed boarding secondary schools in Nakuru County, Kenya.

Recommendations: The government to allocate funds to the schools so that adequate food storage facilities can be constructed. The school management should ensure that all the learners with special dietary needs are offered an alternative diet.

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