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KNOWLEDGE, ATTITUDES, AND PRACTICES TOWARDS COVID-19 VACCINATION AMONG SECONDARY SCHOOL STUDENTS IN KAJIADO COUNTY, KENYA: A CROSS-SECTIONAL STUDY
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KNOWLEDGE, ATTITUDES, AND PRACTICES TOWARDS COVID-19 VACCINATION AMONG SECONDARY SCHOOL STUDENTS IN KAJIADO COUNTY, KENYA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objective: **The study investigated the level of knowledge, attitudes, and practices (KAP) towards COVID-19 vaccination among secondary school students in Kenya and identify significant differences in KAP between students from day and boarding schools.**

Methods: **A descriptive cross-sectional survey conducted among 246 secondary school students in Kajiado North Sub-County, Kenya. Students were selected from five schools using proportionate random sampling. Data were collected through face-to-face interviews using a structured questionnaire, with descriptive statistics and chi-square tests for analysis.**

Results: **95% of students possessed high level of knowledge about COVID-19 vaccination. Our analysis revealed a statistically non-significant difference in vaccine knowledge between students from day secondary schools and those from boarding secondary schools ($\chi 2=0.025$, p=0.874). Attitudes towards vaccination were generally positive among students. However, we identified a significant difference in attitudes towards COVID-19 vaccine between students from day and boarding schools ($\chi 2=10.72$, p=0.001), highlighting a variance in perception based on type of schooling. 95% of the students exhibited supportive and proactive behavior towards COVID-19 vaccination. We did not find any statistically significant difference in practices towards COVID-19 vaccination between students from day and boarding schools ($\chi 2 = 0.209$, p = 0.648).**

Conclusion: **Our study demonstrates a high level of knowledge, positive attitudes, and proactive practices towards COVID-19 vaccination among secondary school students in Kenya, irrespective of school type. The recommendations were: sustain high vaccine knowledge in future, vaccination programs should incorporate regular updates and educational sessions. Ministry of Education and schools should develop vaccination campaign programs involving students and parents, especially in boarding schools.**

INTRODUCTION

The 21st century has been marked by a global transition from infectious to non-communicable diseases (NCDs) as primary health threats. However, in Sub-Saharan Africa (SSA), we continue to grapple significantly with HIV, tuberculosis (TB), malaria, and infections among children. This region faces a triple burden of disease: the persistent threat of infectious diseases, the rising prevalence of NCDs, and the COVID-19 pandemic. This complex health landscape necessitates an unparalleled focus on vaccination and other crucial response mechanisms to address both infectious diseases and NCDs effectively.[1]

The COVID-19 pandemic caused significant disruptions in various sectors, including education. Schools were closed for extended periods, affecting millions of students and interrupting their learning processes. In response to these disruptions, the Kenyan government swiftly prioritized vaccination campaigns to stabilize the situation. A significant emphasis was placed on protecting vulnerable groups although this was latter extended to school going children. This proactive approach was part of Kenya's broader efforts to access and distribute vaccines effectively, ensuring that the population was safeguarded against the severe impacts of COVID-19.[2]

With the onset of the pandemic, Kenya faced immediate disruptions, notably in the education sector, leading to school closures and a pivot to online learning to mitigate virus transmission among students. As 2021 unfolded, Kenya launched a robust 'Operation Back-to-School Campaign,' driven by the Ministry of Education and supported by various government and international partners. This initiative enabled the careful reopening of schools, integrating key safety measures such as social distancing, rigorous hygiene protocols, mandatory health screenings, and limitations on external school visits. Later on, a significant emphasis was placed on student vaccinations to ensure a safer environment for the resumption of in-person learning.[3]

By the end of 2021, Kenya had secured access to several WHO-endorsed COVID-19 vaccines, demonstrating efficacy in preventing the virus's severe effects. Leveraging the COVAX facility, the country set ambitious vaccination targets, aiming for 38% coverage among adults by early 2022 and aspiring for nearly universal adult immunization by year-end. A crucial aspect of this strategy was to vaccinate at least half of the teenagers aged 15-17, acknowledging their crucial role in community health.[4] Initial reports, however, indicated a vaccination uptake of less than 30% among this group, highlighting challenges in achieving desired coverage levels in across the counties.[5]

While existing research, such as the study by Karijo et al., offers insights into the broader youth population's response to COVID-19, it stops short of addressing the specific experiences of secondary school students.[4] This population, navigating a crucial phase of development, faces distinct pressures that influence their health behaviors and attitudes towards vaccination.[4] The absence of focused research on this group limits the effectiveness of tailored public health interventions designed to enhance vaccine uptake among students. This study sought to bridge this gap by delving into the knowledge, attitudes, and practices towards COVID-19 vaccination among secondary school students in Kajiado County, Kenya, thus contributing to a more nuanced understanding of vaccination challenges and opportunities within this critical demographic.

Study Objectives

1. To determine the Knowledge level of students on COVID-19 vaccination in day and boarding schools in Kajiado North Sub-County.
2. To assess the attitude of students towards COVID-19 vaccines in day

and boarding schools in Kajiado North Sub- County.

3. To investigate the practices adopted by students towards COVID-19 vaccines in day and boarding schools in Kajiado North Sub- County.

MATERIAL AND METHODS

Study Design and Population.

This study was designed as a descriptive cross-sectional survey of students attending various secondary schools in Kajiado North Sub-County. The target population was students in secondary schools in Kajiado North Sub-County. Both male and female students who had attended a participating school for at least one term after reopening and were able to communicate fluently in Swahili or English were included. Students who had recovered from COVID-19 were also excluded.

Study Setting

The research was carried out in Kajiado North Sub-County, a region within Kajiado County, Kenya, notable for its cosmopolitan demographic composition and rapid urban growth. Located within the Nairobi Metropolis and boasting the highest number of schools in the county, Kajiado North was an ideal setting for the study. The study setting covered both urban and rural areas within the county, thus providing diverse socio-economic contexts.

This study was conducted across five secondary schools: Lewisa Academy Secondary School, Noonkopir Girls Secondary School, Olooseos Secondary School, Oloolaiser High School, and Star High School. These institutions represented a mix of public and private schools, capturing diverse educational settings within the sub-county. These schools were selected strategically to ensure representation from each of the five wards within Kajiado North Sub-County. The focus on these schools was further influenced by the county's implementation of the government's student vaccination strategy against COVID-19.

Sampling, Data Collection, and Data Analysis

The sampling process began with the selection of the schools. Five schools were chosen purposively based on their implementation of the COVID-19 vaccination program within the Kajiado North sub-county. Once the schools were selected, proportionate random sampling was used to divide the total sample size of 246 students among these five participating schools. Within each school, students were then selected proportionately from different forms to ensure a representative sample of both boys and girls. This two-step approach ensured that the sample was both representative and relevant to the study's objectives.

Participant recruitment involved an informed consent process, wherein parents granted consent and students assented to participate. Initially, potential participants were identified and recruited from the selected schools. Following recruitment, detailed information about the study's purpose, procedures, and confidentiality measures was provided to both parents and students. This ensured that parents could make informed decisions to grant consent, while students could assent to their participation. The process of obtaining informed consent was crucial and did impact the recruitment, as some potential participants were initially hesitant. Addressing their concerns transparently helped in building trust and facilitated smoother recruitment.

Data collection was facilitated through the use of a structured questionnaire, previously utilized and validated in similar studies[12 13]. The questionnaire comprised sections relating to socio-demographic information, knowledge of COVID-19, attitudes towards the virus, and preventative practices. Responses were gathered through face-to-face interviews in classrooms, conducted by

trained research assistants. Analysis of the collected data entailed the use of descriptive statistics and chi-square and was performed using the Statistical Package for the Social Sciences (SPSS), version 25.

Ethical Considerations

This study adhered to strict ethical guidelines to ensure the protection and privacy of all participants. Approval was obtained from the Amref Ethics and Scientific Review Committee and the National Commission for Science, Technology, and Innovations (NACOSTI). ESRC Approval Number-ESRC P1252-2022 Additionally, permission to conduct the study was sought from the Kajiado County Educational Office. The participant recruitment process involved obtaining informed consent from parents, who granted permission for their children to participate in the study, and assent from the students. The consent process provided detailed information about the study's purpose, procedures, potential risks, and benefits, ensuring that both parents and students were fully informed and could make voluntary decisions regarding participation. Participants were also informed of their right to withdraw from the study at any stage without any repercussions. Regular communication with the participating schools was maintained to ensure transparency and address any concerns that arose during the study.

RESULTS

Socio-demographic characteristics of the students: The study included 202 student respondents, with a nearly even gender distribution. The majority of students were aged between 17 and 19 years, accounting for 64.9% of the sample, indicating that the study largely captured the perspectives of older teenagers. Regarding religious affiliation, almost all the students, over 90% were of Christian faith. Class distribution among the respondents showed a relatively balanced representation across different educational levels.

Table 1

Socio-Demographic Characteristics of Students

Variable	**Number of Respondents = 202 (%)**
Age	
14-15 Years	25(12.4%
16 Years	46(22.8%)
17 Years	70(34.7%)
18-19 Years	61(30.2%)
Religion	
Catholic	100(49.5%)
Protestant	87(43.1%)
Muslim	12(5.9%)
Non-Religious	3(1.5%)
Gender	
Male	109(54%)
Female	93(46%)
Classes	
Form One	29(14.4%)
Form Two	44(21.8%)
Form Three	63(31.2%)
Form Four	66(32.7%)

Student knowledge on COVID-19 vaccine: comparison between day and boarding schools.
The analysis of student knowledge on the COVID-19 vaccine revealed that the vast majority of students, 95.3%, had good knowledge of the vaccine. When comparing the type of school, there was no significant difference in vaccine knowledge between students from day secondary schools and boarding secondary schools. The chi-square test value of 0.025 and a p-value of 0.874 indicated no statistically significant association between the type of school and the level of vaccine knowledge.

Table 2
Distribution of Student Knowledge on COVID-19 vaccine based on School Category

Type of School	Vaccine knowledge		Chi Square Value	p-value
	Poor 9(4.5%)	Good 193(95.30%)		
Day Secondary School	5(4.70%)	102 (95.30%)	0.025	0.874
Boarding Secondary School	4 (4.20%)	91(95.80%)		

Student Attitude Towards COVID-19 Vaccine: Comparison Between Day and Boarding Schools.
The analysis of student attitudes towards the COVID-19 vaccine revealed significant differences based on school category. Overall, three quarter of the students had a positive attitude towards the vaccine. Notably, students from day secondary schools exhibited a more positive attitude compared to their counterparts in boarding secondary schools. This was supported by a chi-square test value of 10.729 and a p-value of 0.001, which indicated a statistically significant association between the type of school and the students' attitudes towards the COVID-19 vaccine.

Table 1
Distribution of Student Attitude Towards COVID-19 vaccine Based on School Category

Type of School	Attitude		Chi Square Value	P-value
	Negative 49 (24.3%)	Positive 153(75.7%)		
Day Secondary School	16(15.00%)	91(85.00%)	10.729	0.001
Boarding Secondary School	33(34.70%)	62 (65.30%)		

Student practices towards COVID-19 vaccine: comparison between day and boarding schools.
The analysis of student practices towards the COVID-19 vaccine showed that a large majority of students (95%) engaged in proactive practices. When comparing school categories, nearly all students from both day secondary schools and boarding secondary schools were engaged in proactive practices. The chi-square test value of 0.209 and a p-value of 0.648 indicated no statistically significant difference in practices towards the COVID-19 vaccine based on school category.

Table 2:
Distribution of Student Supportive Practices Towards COVID-19 Vaccine based on School Category

Type of School	Practices		Chi Square Value	p-Value
	Proactive 192(95%)	Passive 10 (5%)		
Day Secondary School	101(96.1%)	4(3.90%)	0.209	0.648
Boarding Secondary School	91(95.00)	6(5.00%)		

DISCUSSION

This study aimed to explore the knowledge, attitudes, and practices towards COVID-19 vaccination among secondary school students in Kajiado County, Kenya, comparing the perspectives of students from day schools and boarding schools. The findings highlight a high level of understanding about the COVID-19 vaccine among students, irrespective of the school type. The high level of knowledge in day and boarding schools could be attributed to the various sensitization efforts about COVID-19 vaccination by the government, health authorities and educational institutions[6]. Similar findings were established in an Ethiopian study that found no significant difference in vaccine knowledge levels based on schooling environment[7].

The findings revealed that a significant difference exists between day and boarding school students in their attitudes towards the COVID-19 vaccine. The observed difference in attitudes towards the COVID-19 vaccine between day and boarding school students can be substantiated by empirical evidence that suggests the environment in which students learn and live significantly influences their health behaviors and attitudes[8]. Students in day secondary schools typically spend more time with their families, which can significantly influence their health-related attitudes and behaviors. Parents and guardians who are well-informed and supportive of vaccination can play a crucial role in shaping positive attitudes towards the COVID-19 vaccine. In contrast, students in boarding schools have limited daily interaction with their families, reducing the immediate influence of parental guidance on their attitudes[9].

Several empirical studies support the notion that family influence plays a critical role in shaping health-related attitudes and behaviors among adolescents[14] [15]. This is particularly relevant in the context of COVID-19 vaccination attitudes. A study in China examined the influence of parental communication on adolescents' attitudes towards COVID-19 vaccine, with the study reporting that students regular communicating with parents had a more favorable attitude towards COVID-19 vaccine[10].

The findings of the study depict a high level of positive practices towards the COVID-19 vaccine among both day and boarding secondary school students. This indicates a considerable level of compliance with COVID-19 preventive measures and acceptance of the vaccination program among the student population irrespective of their school type. Interestingly, this high level of vaccine-friendly practices among students confirms the high level of supportive practices towards COVID-19 vaccine noted in previous findings [12] [13].

The findings of the study depict a high level of positive practices towards the COVID-19 vaccine among both day and boarding secondary school students. This indicates a considerable level of compliance with COVID-19 preventive measures and acceptance of the vaccination program among the student population, irrespective of their school type. The high level of vaccine-friendly practices observed aligns well with several tenets of the Health Belief Model (HBM)[11].

The high knowledge levels about the COVID-19 vaccine align with the HBM's concepts of perceived susceptibility and perceived severity. Students who are well-informed about the risks of COVID-19 and the benefits of vaccination are more likely to perceive the disease as a serious threat, which increases their motivation to engage in preventive behaviors. The positive attitudes towards the vaccine among students reflect the HBM's concept of perceived benefits. Recognizing the advantages of vaccination, such as protection against the virus and the

prevention of disease spread, students are more likely to adopt supportive practices towards vaccination. Furthermore, the minimal negative attitudes and high compliance with vaccine-related practices indicate low perceived barriers, another key component of the HBM. When students perceive fewer obstacles to getting vaccinated, such as accessibility and trust in the vaccine's efficacy, they are more likely to participate in vaccination programs. The study's findings confirm that knowledge and positive attitudes, as posited by the Health Belief Model, play a crucial role in fostering health-enhancing behaviors among secondary school students in Kajiado County.

RECOMMENDATION

The study revealed that a good knowledge of the COVID-19 vaccine in day and boarding schools. To maintain this high level of knowledge, future vaccination programs should include regular updates and educational sessions to ensure that students remain well-informed about vaccination benefits and developments. Significant differences in attitudes towards the COVID-19 vaccine were observed from day secondary and boarding schools. The Ministry of Education and schools should in future develop programs that involve both students and parents, particularly in boarding schools.

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