ASSESSMENT OF KNOWLEDGE OF RISK FACTORS AND PREVENTION STRATEGIES OF MONKEY POX AMONG SECONDARY SCHOOL STUDENTS IN ODEDA LOCAL GOVERNMENT, OGUN STATE

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Abstract
This study sought to investigates the assessment of knowledge on risk factors and prevention strategies of monkey pox among secondary school students in Odeda Local Government, Ogun. Monkeypox is endemic in Western Africa, primarily circulating within unknown animal hosts but emerging periodically to affect humans. The outbreak was linked to river flooding that brought infected wild animals, particularly rodents and monkeys, into close contact with humans. The mode of transmission makes human vulnerable to infectious diseases. The study adopted a cross–sectional survey which was conducted among secondary school students. 250 respondents were selected after stratification. A self-developed questionnaire was used for the studies. Data collected and analyzed using descriptive statistics and Inferential Statistics; frequency count, mean and standard deviation, Chi-Square was used to test the hypotheses raised at 0.05 level of significance. The finding of the study revealed that majority of participants 63.2% had poor knowledge, while 36.8% had good knowledge about the monkeypox virus. However, 78.8% of the participants reported that they had no unprotected contact with squirrels, while 21.2% acknowledged such contact. Also, the finding revealed that 53.2% of participants reported that Personal Protective Equipment (PPE) like disposable gowns, gloves, eye protection, and face masks are available in the school environment, while 46.8% indicated that they are not. Also, there were significant differences in the level of knowledge about monkeypox based on gender, class, and place of residence. Specifically, males had better knowledge than females (P = 0.000), participants in SS2 had better knowledge than those in SSS1 and SSS3 (P = 0.021), and urban residents had better knowledge than rural residents (P = 0.024). Based on the findings, the following recommendations were put forward amongst others; There is a need for comprehensive education and training programs on infectious disease prevention in schools There is a need for comprehensive education and training programs on infectious disease prevention in schools There is a need for comprehensive education and training programs on infectious disease prevention in schools There is a need for comprehensive education and training programs on infectious disease prevention in schools . Community-based campaigns and partnerships with local health authorities and animal control agencies should be continuing exercises.

Key Words: Assessment, Monkeypox, Risk factor, Students

Introduction

The emergence of monkeypox as a significant public health concern in Nigeria has underscored the pressing need for effective prevention strategies. Monkeypox, a rare viral zoonosis, shares symptoms with smallpox but generally causes less severe illness in humans. It is attributed to the Monkeypox virus, an Orthopoxvirus, which belongs to the same genus as camelpox, cowpox, vaccinia, and variola viruses (WHO, 2016). Remarkably, since the eradication of smallpox in 1980, monkeypox has become the most significant orthopoxvirus infection affecting human populations (Meyer et al., 2020). This infectious disease is endemic in Western and Central Africa, primarily circulating within unidentified animal hosts but periodically emerging to affect humans. Initially confined to certain regions within the rainforests of Central and West Africa, monkeypox has gradually encroached upon urban areas as well (Simpson et al., 2020).

Monkeypox was first documented in humans in the Democratic Republic of Congo in 1970. Between 1970 and 1986, it affected over 400 people across Central Africa, and over the subsequent 30 years, cases increased by a significant 20-fold (Rahimi *et al.,* 2022). In 2017, a major outbreak struck Nigeria, impacting 11 states and 74 individuals. This outbreak was linked to river flooding that brought infected wild animals, particularly rodents and monkeys, into close contact with humans. By November 2019, Nigeria faced its largest Monkeypox outbreak ever, with a notable demographic shift. While historically, most cases affected those under 15 years, this outbreak had a higher prevalence among adults aged 21 to 40 (Ajibo *et al.,* 2018). As of July 2022, Nigeria had reported 133 confirmed cases in 26 states, totaling 869 confirmed cases across 35 states since the virus's reemergence in September 2017 (Korosec *et al.,* 2023).

Monkeypox infection typically starts with lesions in the oral cavity, followed by a distinctive rash on the skin spreading from the trunk to the palms and soles. Symptoms include fever, headache, muscle aches, swollen lymph nodes, chills, and exhaustion. The rash progresses through stages from macules to papules, vesicles, pustules, and scabs (Patel *et al.,* 2022). Transmission is primarily linked to contact with infected animals, particularly African rodents, which serve as major vectors and reservoirs of infection. Transmission can occur through direct contact with infected animals, ingestion of undercooked animal flesh, or contact with cutaneous or mucosal lesions on the animal. Human-to-human transmission can happen during the early stages of the rash, mainly within the first week (Yinka-Ogunleye *et al.,* 2019). Preventive measures include avoiding contact with animals that may carry the virus, refraining from touching objects in contact with sick animals, maintaining good hand hygiene, wearing personal protective equipment when caring for infected individuals, and vaccination. Vaccines, antivirals, and vaccinia immune globulin (VIG) have proven effective in preventing the virus's spread (Alakunle *et al.,* 2020).

Monkeypox has affected children and adolescents in endemic regions. However, a recent outbreak has raised concerns about its potential as a new threat (Youssef *et al.,*2023). Children, especially secondary school students, are at risk of contracting monkeypox through close contact with symptomatic individuals, often within their families. The majority of cases have involved individuals under the age of 16, with a 1:10 mortality rate (Yinka-Ogunleye *et al.,* 2019). Given that secondary school students are within the age

group most affected by the virus, assessing their knowledge of the risk factors and prevention strategies for monkeypox is crucial. This study aims to assess the knowledge of risk factors and prevention strategies of monkeypox among secondary school students in Odeda Local Government, Ogun State.

Methodology

The study adopted a descriptive design survey typeAll senior secondary school students in Ogun State's Odeda Local Government Area made up the study's population. A multistage sampling strategy was used to choose 250 responders. First, three public senior secondary schools were chosen at random from among the eleven senior secondary schools in the Odeda Local Government Area using a simple random selection technique. Subsequently, senior secondary students were chosen using a stratified sampling technique, with a focus on SSS 1 - SSS 3 students to complete the survey. Lastly, 250 responses from these senior classes were chosen using a simple random sample procedure.

A self-developed questionnaire with two sections, A and B, served as the research tool for this study. Section A collected demographic information from the respondents, while Section B collected data on knowledge of the monkeypox virus, risk factors for monkeypox, and prevention methods against the virus. A closed-ended Likert scale summarising Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) was used in the questionnaire. Three specialists in the fields of health education, measurement, and evaluation at the Federal College of Education in Abeokuta, Ogun State, Nigeria, validated the face and content validity of the study instrument. Cronbach alpha was used to assess the instrument's dependability; the results were 0.75, 0.82, and 079, respectively. The data gathered from the administered instrument were analyzed using descriptive statistics (Mean and Standard deviation) to answer the research questions and inferential statistics of Pearson Product Moment Correlation to test the hypothesis stated at 0.05 alpha level of significance

Results

Table 1: Socio-demographic Characteristics of the Respondents

Variables	Frequency	Percent (%)
Age(n=250)		
Mean ± S. D	14.58±1.517	
Gender		
Male	131	52.4
Female	119	47.6
Religion		
Christian	200	80.0
Muslim	45	18.0
Others	5	2.0
Class	117	46.8

SSS1	82	32.8
SSS2	50	20.0
SSS3		
Tribe		
Yoruba	184	73.6
Hausa	19	7.6
Ibo	38	25.2
Others	9	3.6
Family Type		
Nuclear	213	85.2
Polygamous	25	10.0
Single Parent	8	3.2
Orphan	4	1.6
Place of Residence		
Urban	208	83.2
Rural	42	16.8
Parent Occupation		
Civil Servant	127	50.8
Trading	55	22.0
Farming	19	7.6
Clergy	17	6.8
Artisan	32	12.8

Table 1 shows the socio-demographic characteristics of the participants. The study involved 250 participants. The mean age of the respondents was 14.58 ±1.52. The majority of participants were male 131 (52.4%) while 119 (47.6%) were female. On religious affiliations, the majority were Christians, 200 (80%), 45 (18%) were Muslim, and 5 (2%) were Traditional. The majority of the respondents were Yoruba 184 (73.6%), 19 (7.6%) were Hausa, 38 (25.2%) were Ibo, and 9 (3.6%) were in the others category. In terms of academic level, 117 (46.8%) were in SS1, 82 (32.8%) in SS2, and 50 (20%) in SS3. In terms of family structure, the majority of the respondents were from nuclear families (85.2%), 25 (10%) were from polygamous families, 8 (3.2%) were from single-parent families, and 4 (1.6%) were orphans. 208 (83.2%) live in urban areas, while 42 (16.8%) live in rural areas. In terms of occupation, 127 (50.8%) had parents working as civil servants, 55 (22%) had parents engaged in trade, 19 (7.6%) had parents working in farming, 17 (6.8%) had parents in clergy positions, and 32 (12.8%) had parents in artisanal occupations.

Table 2: Level of knowledge of monkeypox virus among secondary school students in Odeda LGA

Variables	Frequency	Percent (%)
Good Knowledge	92	36.8
Poor Knowledge	158	63.2

Table 2 revealed that the majority 63.2% of participants had poor knowledge, while 36.8% had good knowledge about the monkeypox virus.

Table 3: Risk factors contributing to monkeypox virus exposure among secondary school students in Odeda Local Government Area.

Variables	Frequency	Percent (%)
Unprotected contact with Squirrel		
No	197	78.8
Yes	53	21.2
Unprotected contact with Rodents(rats)		
No	185	74.0
Yes	65	26.0
Unprotected contact with non-human primates (monkeys, baboons)		
No	199	79.6
Yes	51	20.4
Unprotected contact with an infected person's skin and the mucous membranes, skin, lesions, bodily fluids		
No	197	78.8
Yes	53	21.2
Staying inside a patient's room or within 6 feet of a patient during any procedures that may create aerosols from oral secretions, skin lesions	208	83.2
No	42	16.8
Yes		
Participating in activities resulting in contact between sleeves and other parts of an individual's clothing and the patient's skin lesions or bodily fluids or their soiled linens or dressings	185	74.0
No	65	26.0
Yes		

Table 3 provides insights into the various behaviors and contacts that can potentially increase the risk of Monkeypox virus exposure among the respondents. 78.8% of the participants reported that they had no unprotected contact with squirrels, while 21.2% acknowledged such contact. 74.0% of participants stated that they had no unprotected contact with rodents (rats), while 26.0% reported such contact. 79.6% of participants did not have unprotected contact with non-human primates, whereas 20.4% reported such contact. 78.8% of participants reported no unprotected contact with an infected person's skin, mucous membranes, skin lesions, or bodily fluids. However, 21.2% acknowledged such contact. The majority of participants, 83.2%, reported not staying inside a patient's room or within 6 feet of a patient during procedures that generate aerosols. However, 16.8% acknowledged being in such situations. 74.0% of participants did not engage in activities resulting in contact between their clothing and a patient's skin lesions, bodily fluids, or soiled linens or dressings. However, 26.0% reported participating in such activities.

Table 4: Prevention strategies available in the schools

Variables	Frequency	Percent (%)
Washing of hands often during school hours		
No	84	33.6
Yes	166	66.4
Personal protective equipment PPE (disposable gown and gloves, eye protection, and FFP2 masks) available in the school environment	117	46.8
No	133	53.2
Yes		
Educated and trained about monkeypox prevention	109	43.6
No	141	56.4
Yes		
Editorials, reviews, and WHO, CDC, and ECDC guidelines provide indications about appropriate practices		
No	110	44.0
Yes	140	56.0

Table 4 provides insights into the practices and awareness levels of students in the school environment concerning Monkeypox prevention. 66.4% of the participants reported that they wash their hands often during school hours, while 33.6% indicated that they do not. 53.2% of participants reported that Personal Protective Equipment (PPE) like disposable gowns, gloves, eye protection, and FFP2 masks are available in the school environment, while 46.8% indicated that they are not. 56.4% of participants reported that they have been

educated and trained about Monkeypox prevention, while 43.6% indicated that they have not. 56.0% of participants are aware that editorials, reviews, and guidelines from organizations like WHO, CDC, and ECDC provide indications about appropriate practices, while 44.0% are not aware.

Table 5: Relationship between the level of knowledge about monkeypox and gender, religion, class and place of residence

Variable	Good Knowledge(n=92)	Poor Knowledge(n=158)	P-Value	Decision Rule
Gender				Rejected
Male	62(47.3)	69(52.7)	0.000	
Female	30(25.2)	89(74.8)		
Religion				Fail to reject
Christian	74(37.0)	126(63.0)	0.211	
Islam	18(40.0)	27(60.0)		
Others	0(0.0)	5(100.0)		
Class				Rejected
SSS1	35(29.9)	82(70.1)	0.021	
SSS2	40(48.8)	42(51.2)		
SSS3	17(33.3)	34(66.7)		
Place of Residence				Rejected
	83(39.9)	125(60.1)	0.024	
Urban	9(21.4)	33(78.6)		
Rural				

Table 5 presents a comparison of good and poor knowledge regarding Monkeypox based on various demographic factors among the study participants. The results show that there were significant differences in the level of knowledge about monkeypox based on gender, class, and place of residence. Specifically, males had better knowledge than females (P = 0.000), participants in SS2 had better knowledge than those in SSS1 and SSS3 (P = 0.021), and urban residents had better knowledge than rural residents (P = 0.024). On the other hand, there were no significant differences in the level of knowledge about monkeypox based on religion. This suggests that these demographic variables may not be strong predictors of knowledge about monkeypox.

Table 6: There is no significant relationship between the knowledge of monkey pox and prevention strategies of monkeypox among Secondary School Students in Odeda Local Government, Ogun State

Variables	Good Knowledge	Poor Knowledge	Level of Significance	Decision
Washing of hands often during school hours			0.005	Rejected
No				
Yes	40	44		
	49	117		
Are personal protective equipment PPE (disposable gown and gloves, eye protection, and FFP2 masks) available in the school environment			0.000	Rejected
No				
Yes	58	59		
	31	102		
Have you been educated and training about monkey pox preventive			0.001	Rjected
No	51	58		
Yes	38	103		
Do you know Editorials, reviews, and WHO, CDC, and ECDC guidelines provide indications about appropriate practices			0.001	Rejected
No	52	58		
Yes	37	103		

Table 6 shows that there is a significant relationship between knowledge of monkeypox and prevention strategies of monkeypox among Secondary School Students in Odeda Local Government, Ogun State.

Discussion of findings

The results showed that the majority of the participants had poor knowledge about monkeypox. This finding suggests that there is a significant knowledge gap among secondary school students in Odeda LGA when it comes to the monkeypox virus. This finding is consistent with previous research that has highlighted a knowledge gap among the general population when it comes to the monkeypox virus (Alsanafi *et al.,* 2022). A similar observation was reported by Harapan *et al.,* 2020. In a recent study among general

practitioners in Indonesia (Sallam *et al.,* 2022), possible explanations for the low levels of knowledge among the participants may include a lack of public health education programs or a lack of awareness of the disease itself. Additionally, the participants may have had misconceptions or misunderstandings about monkeypox, which could have affected their level of knowledge.

Also, the findings of this study are consistent with previous research that has identified contact with infected animals as a major risk factor for monkeypox transmission (Quiner *et al.,* 2017). Lulli *et al.,* 2022 identified contaminated surfaces as a potential source of transmission. This finding suggests that there is a need for public health interventions aimed at increasing awareness of the risk factors for contracting monkeypox and promoting preventive measures among secondary school students. These findings are consistent with previous research on infectious disease prevention in school settings, which has shown that hand hygiene and the availability of PPE are effective measures for reducing the transmission of infectious diseases (Huang & Wang 2022; John Ritzk *et al.,* 2022). However, the lack of education and training about prevention measures and guidelines is a concerning finding, as it suggests that students may not have sufficient knowledge to protect themselves and others from the spread of infectious diseases.

In addition, this study also investigated the relationship between the level of knowledge about monkeypox and various demographic variables. The results showed that gender, class, and place of residence were significant predictors of knowledge about monkeypox, with males, participants in SS2, and urban residents having better knowledge than females, participants in SS1 and SS3, and rural residents, respectively. These findings are consistent with previous studies that have shown variations in knowledge about infectious diseases based on demographic variables (Nwankwo *et al.,* 2016). In comparing these findings to previous research, it has been shown that demographic variables such as gender, age, education, and place of residence have been associated with the level of knowledge about infectious diseases. For instance, previous studies have shown that females tend to have poorer knowledge about infectious diseases compared to males (Musa *et al.,* 2015). Similarly, participants with higher education levels and those living in urban areas have been found to have better knowledge about infectious diseases compared to those with lower education levels and those living in rural areas (Ogunnowo *et al.,* 2018). However, the lack of significant differences in knowledge based on religion, tribe, family type, and parent occupation suggest that these demographic variables may not be strong predictors of knowledge about monkeypox. The findings of this study highlight the need for targeted educational interventions aimed at increasing awareness of monkeypox prevention strategies and promoting adherence to appropriate practices, particularly among secondary school students in Odeda LGA.

Conclusion

The study conducted among secondary school students in Odeda LGA has revealed substantial knowledge gaps regarding monkeypox, with only 36.8% demonstrating good knowledge of the disease. Furthermore, a significant portion of students engage in behaviors that heighten their risk of contracting the disease. In response to these findings,

it is imperative for public health authorities to launch targeted educational initiatives. These programs should prioritize the enhancement of awareness and understanding of monkeypox, encompassing critical aspects such as transmission routes, risk factors, and preventive measures. By bolstering the knowledge and awareness of secondary school students, these efforts aim to mitigate the transmission of the disease and protect the health of both students and the broader community. Essentially, the study underscores the urgent need for comprehensive public health education and awareness campaigns, particularly among young individuals who may face an elevated risk of contracting monkeypox.Based on the findings of the study, the following recommendations are, therefore, made;

a. There is a need for comprehensive education and training programs on infectious disease prevention in schools. These programs should address gaps in knowledge and awareness, and include information on the transmission routes of monkeypox, risk factors for contracting the disease, and prevention strategies, such as hand hygiene and the use of PPE.
b. Public health interventions should be developed to increase awareness of the risk factors for contracting monkeypox and promote preventive measures among secondary school students. Community-based campaigns and partnerships with local health authorities and animal control agencies could be effective ways to achieve this.
c. Education and awareness campaigns should not be limited to secondary school students only. Other vulnerable populations, such as healthcare workers, animal handlers, and those living near infected animals, should also be targeted. In addition, the campaigns should be culturally sensitive and tailored to the specific needs of the population being targeted.

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