



Science Forum (Journal of Pure and Applied Sciences)

Journal Homepage: <https://atbuscienceforum.com.ng/index.php/jpas>



Prevalence of Scabies and Its Association with Percentage Body Fat Among Almajiri School Students in Zaria, Nigeria: A Cross-Sectional Study

Yerima Abubakar Muhammad¹, Ibrahim Tasiu², Abubakar Hauwa'u³

¹Department of Anatomy, Bayero University, Kano, Nigeria

²Department of Anatomy, Ahmadu University, Zaria, Nigeria

³Department of Microbiology, Bayero University, Kano, Nigeria

Abstract

Scabies remains a major neglected parasitic skin disease among vulnerable populations living under conditions characterized by overcrowding, poor hygiene, and limited access to healthcare. This study investigated the prevalence of scabies and its relationship with percentage body fat among selected Almajiri students in Samaru, Zaria. A cross-sectional descriptive study was conducted among 100 male Almajiri students aged 5-20 years. Anthropometric measurements, including height and weight, were obtained using standard procedures, while clinical skin examinations were performed to identify suspected cases of scabies based on characteristic dermatological manifestations. Percentage body fat was estimated using body mass index (BMI)-derived predictive equations. Data were analyzed using the Statistical Package for the Social Sciences (SPSS), with descriptive statistics used to summarize demographic and anthropometric characteristics, and inferential statistics employed to determine the association between percentage body fat and scabies prevalence at a significance level of $p < 0.05$. The findings revealed that 36% of the participants were clinically identified with scabies, whereas 64% showed no evidence of infestation. Assessment of disease awareness indicated that only 12% of the students had prior knowledge of scabies, while 88% lacked awareness of the condition. Evaluation of nutritional status based on percentage body fat showed that 18% of the participants were underweight, whereas 82% fell within the normal body fat range. Statistical analysis demonstrated no significant association between percentage body fat and the prevalence of scabies ($p > 0.05$), suggesting that body fat status was not a significant predictor of infestation in the study population. These findings underscore the need for targeted health education, improved hygiene practices, and routine scabies screening among Almajiri communities to reduce disease transmission and improve child health outcomes.

Keywords

Scabies,
Body Fat Percentage,
Almajiri Students,
Nutritional Status,
School Health,
Nigeria.



Introduction

Scabies is a highly contagious parasitic skin infestation caused by *Sarcoptes scabiei* var. *hominis* and remains a significant public health concern, particularly in low- and middle-income countries. (Kouotou et al., 2016) The condition is strongly associated with overcrowding, poor hygiene, and limited access to healthcare, making children in vulnerable communities especially susceptible. (Ugbomoiko et al., 2018). In school environments where close contact is frequent, scabies transmission can occur rapidly and persist if preventive measures are inadequate.

Globally, scabies contributes substantially to dermatological morbidity among children and is increasingly recognized as a neglected tropical disease with important social and health consequences. In sub-Saharan Africa, prevalence rates among school-aged children remain high, particularly in underserved populations. Despite its burden, awareness and early treatment practices remain limited in many communities. (Ugbomoiko et al., 2018).

Nutritional status is a key determinant of immune competence and susceptibility to infectious diseases. While previous studies have examined associations between scabies and factors such as hygiene practices, crowding, and socioeconomic conditions, limited attention has been given to the role of body composition, particularly percentage body fat, in influencing vulnerability to infestation. Understanding this relationship is important, as it may provide insights into the biological and environmental determinants of scabies transmission among children. (Haile et al., 2020).

Almajiri school students represent a unique and vulnerable population in Northern

Nigeria, often characterized by communal living conditions, limited parental supervision, and restricted access to healthcare services. These factors may increase the risk of communicable diseases, including scabies, and highlight the need for targeted epidemiological research within this group. (Emanghe, 2024).

This study aimed to determine the prevalence of scabies and assess its association with percentage body fat among some Almajiri students in Hayin Dogo Samaru, Zaria. The findings are expected to contribute to existing knowledge on the epidemiology of scabies in vulnerable school populations and inform public health interventions aimed at reducing disease burden and improving child health outcomes.

Methods

Study Design And Setting
A cross-sectional descriptive study was conducted among students of Mallam Bara'u Almajiri School located in Hayin Dogo, Samaru, Zaria, Kaduna State, Nigeria. The study population comprised male children and youth learners enrolled in the Almajiri educational system, a traditional learning structure prevalent in Northern Nigeria.

Study Population and Sampling
Participants were recruited using a total sampling approach among eligible children present during the study period. Inclusion criteria included children who were available, consented to participate, and had no visible chronic medical conditions unrelated to scabies at the time of assessment.

Ethical Considerations

Ethical approval for the study was obtained from the appropriate institutional authority of Ahmadu Bello University, Zaria. Permission was also obtained from school

authorities. Participation was voluntary, and confidentiality of all participants was maintained throughout the study.

Data Collection

Sociodemographic data were obtained using a structured questionnaire. Clinical examination of the children was carried out to identify features suggestive of scabies infestation based on established diagnostic criteria, including characteristic lesions and distribution patterns.

Anthropometric Measurements

Anthropometric assessments were conducted following standard procedures. Body weight was measured using a calibrated weighing scale, and height was measured using a stadiometer. Body Mass Index (BMI) was calculated as weight in kilograms divided by the square of height in meters (kg/m^2). Percentage body fat was estimated using BMI-derived prediction models appropriate for children and youths.

Assessment of Scabies

Diagnosis of scabies was based on clinical evaluation, including the presence of pruritic papular lesions, distribution in typical anatomical sites, and associated symptoms consistent with infestation.

Data Analysis

Data obtained were entered and analyzed using statistical software. Descriptive statistics were used to summarize demographic characteristics, prevalence of scabies, and nutritional indicators. Inferential statistics were applied to assess associations between scabies infestation and percentage body fat, age, and nutritional status. Statistical significance was set at $p < 0.05$.

Percentage Body Fat Calculation: The following formula was used to estimate the percentage body fat; $1.5 (\text{Body Mass Index}) - 0.7 (\text{Age}) - 2.2$ with percentage body fat ranges less than 12% been underweight, 14-22% normal weight. 18-32% overweight, and over 32% considered obese

Software Utilization: All statistical analyses were carried out using Statistical Package for Social Sciences (SPSS) version 25.0. The results were considered statistically insignificant at $p > 0.05$.

Limitations

The use of BMI-derived estimation for body fat may not fully reflect true adiposity compared with more advanced body composition techniques. Additionally, clinical diagnosis of scabies without laboratory confirmation may introduce diagnostic variability.

Results

Participant	Characteristics
A total of 100 students from Mallam Bara'u Almajiri School participated in the study. The participants were predominantly within the school-age group, reflecting the demographic structure of the Almajiri educational setting.	

Prevalence of Scabies

The overall prevalence of clinically diagnosed scabies among the children was high. A substantial proportion of participants presented with characteristic lesions and symptoms consistent with infestation, indicating a significant burden of disease within the study population.

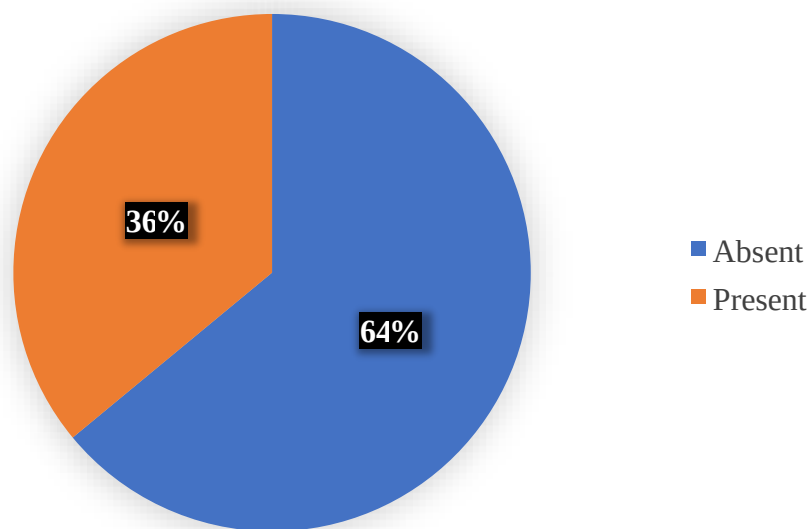


Figure 1: Prevalence of Scabies in the study population

Awareness of Scabies

Awareness of scabies among the children was low. Only a small fraction of participants reported prior knowledge of the condition, its transmission, or preventive measures.

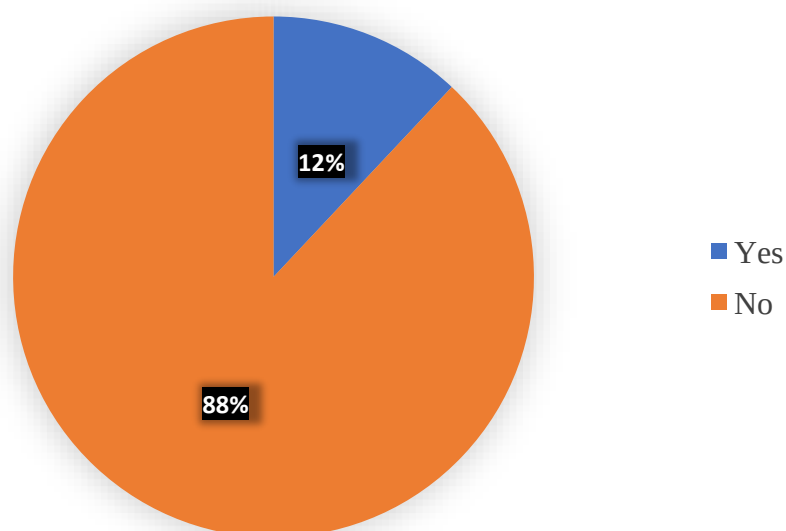


Figure 2: Awareness of Scabies in the Study Population

Nutritional Status and Body Fat Estimation

Anthropometric assessment showed that the majority of the children fell within the normal nutritional range based on BMI classification, while a smaller proportion were categorized as underweight. Percentage body fat estimated using BMI-derived prediction methods showed variation across participants but remained generally within expected ranges for age.

Association Between Scabies and Percentage Body Fat

Statistical analysis revealed no significant association between scabies infestation and percentage body fat among the children ($p > 0.05$). Children with scabies did not differ significantly in estimated body fat compared with those without infestation.

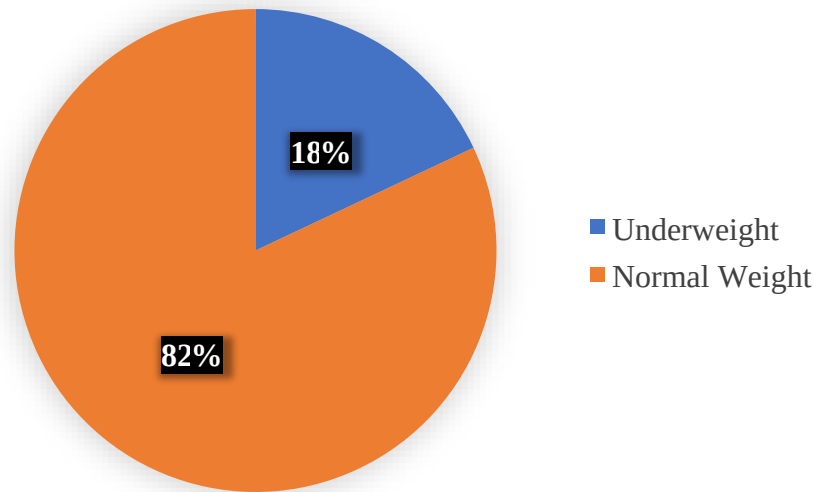


Figure 3: Percentage Body Fat in the study Population

Association Between Scabies and Age

There was no statistically significant relationship between age and the occurrence of scabies infestation ($p > 0.05$).

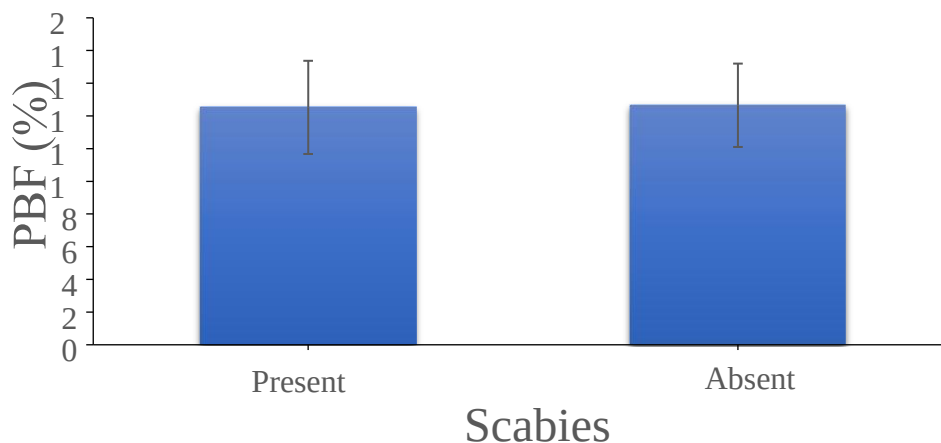


Figure 4: Comparison of Mean Percentage Body Fat (PBF) Between Participants with and Without Scabies

PBF: Percentage Body Fat N=100, mean $\pm$ SD, Independent sample t-test, $p > 0.05$ when

comparison of PBF was made between across various groups

Table 1: Association between PBF and scabies

Variables	Absent	Present	X ²	P
Underweight	9	9	.735 ^a	0.275
Normal Weight	32	50		

Summary of Key Findings

The findings indicate a high prevalence of scabies among Almajiri children, low awareness of the condition, and no measurable association between infestation and percentage body fat or age. These results suggest that environmental, hygiene, and social determinants may play a more prominent role in disease transmission within this population.

Discussion

This study revealed a high prevalence of scabies among Almajiri students in Hayin dogo Zaria, highlighting the continuing burden of communicable skin diseases among children in under equipped educational and residential settings. The prevalence observed in this study underscores the vulnerability of this population and aligns with findings from similar studies conducted in resource-limited communities where overcrowding and limited access to hygiene facilities contribute to transmission. (Kouotou,2015).

Despite assessing the relationship between scabies infestation and percentage body fat, no statistically significant association was identified. This finding suggests that nutritional status, as estimated by BMI-derived body fat percentage, may not be a primary determinant of susceptibility to scabies infestation within this population. Instead, environmental and behavioral factors appear to play a more prominent role in transmission dynamics.

The absence of association between body fat and scabies may be explained by the biology of infestation. Scabies transmission is primarily driven by prolonged skin-to-skin contact and the sharing of personal items such as clothing and bedding, rather than host adiposity. While malnutrition can influence immune competence, the living conditions typical of Almajiri settings including communal sleeping arrangements, limited hygiene resources, and frequent close contact may override physiological differences in body composition.

Low awareness of scabies observed among participants further contributes to the persistence of infestation. Poor knowledge regarding transmission, prevention, and treatment can delay recognition and increase the likelihood of spread within communal environments. This finding is consistent with reports from other school-based studies where health education deficits were strongly linked to continued transmission.

The study also found no significant association between age and scabies infestation, suggesting that exposure risk is relatively uniform across the school-age population in communal living environments. This supports the notion that environmental exposure rather than individual biological characteristics is the dominant factor influencing infestation patterns.

Findings related to hygiene practices, overcrowding, and sharing of personal items reinforce the role of social determinants in

scabies transmission. These conditions create an enabling environment for rapid spread and reinfestation, particularly where access to healthcare and treatment is limited.

Public health implications of these findings are significant. Interventions should prioritize health education, improvement of personal hygiene practices, regular screening in schools, and community-based treatment programs. Policies addressing overcrowding and improving access to basic sanitation facilities may substantially reduce disease burden in this population.

Limitations of the study include reliance on BMI-derived estimation of body fat rather than direct body composition techniques and the use of clinical diagnosis without laboratory confirmation, which may introduce diagnostic variability. Additionally, the cross-sectional design limits causal inference between identified risk factors and infestation.

Despite these limitations, the study provides important insights into the epidemiology of scabies among Almajiri students and highlights the need for targeted public health strategies focusing on environmental and behavioral determinants rather than solely biological factors.

Conclusion

Scabies remains highly prevalent among Almajiri students in Samaru, Zaria, with over one-third of participants affected and limited awareness of the condition. Percentage body fat, estimated using BMI-derived methods, showed no significant association with scabies infestation, indicating that body composition is not a major determinant of susceptibility in this population. The findings suggest that environmental and behavioral factors such as

overcrowding, hygiene practices, and sharing of personal items are more critical drivers of transmission. Targeted school-based health education, improved sanitation, and periodic screening are recommended to reduce the burden of scabies among vulnerable children.

Author Contributions

Yerima Abubakar Muhammad:

Conceptualization, study design, data collection, formal analysis, interpretation of data, and drafting of the original manuscript.

Dr. I. Tasiu: Supervision, methodological guidance, contribution to the study design, critical review and editing of the manuscript, and approval of the final version.

Abubakar Hauwa'u: Contribution to the interpretation of findings, review and editing of the manuscript.

All authors read and approved the final manuscript.

Funding

This research received no external funding.

Conflict of Interest

The authors declare no conflict of interest.

Ethical Approval Statement

Ethical approval for this study was obtained from the appropriate institutional authority of Ahmadu Bello University, Zaria. Permission was also obtained from the school authorities. Participation was voluntary, and confidentiality of participants was maintained throughout the study.

References

- Ugbomoiko, U. S., Oyediji, S. A., Babamale, O. A., & Heukelbach, J. (2018). Scabies in resourcepoor communities in Nasarawa state, Nigeria:

epidemiology, clinical features and factors associated with infestation. *Tropical medicine and infectious disease*, 3(2), 59.

Emanghe, U. E., Imalele, E. E., Ogban, G. I., & Owai, P. A. (2024). Awareness and Knowledge of Scabies and Ringworm among Parents of School-age Children in Calabar, Cross River State, Nigeria: Implications for Prevention of Superficial Skin Infestations. *Annals of African Medicine*, 23(1), 62-69.

Haile, T., Sisay, T., & Jemere, T. (2020). Scabies and its associated factors among under 15 year's children in Wadila district, Northern Ethiopia, 2019. *Pan African Medical Journal*, 37.

<https://doi.org/10.11604/pamj.2020.37.224.25753>

Kouotou, E. A., Nansseu, J. R. N., Kouawa, M. K., & Zoung-Kanyi Bissek, A.-C. (2016). Prevalence and drivers of human scabies among children and adolescents living and studying in Cameroonian boarding schools. *Parasites & vectors*, 9, 1-6.