GENERAL HYGIENE PRACTICES AMONG SECONDARY SCHOOL STUDENTS IN ENUGU EDUCATION ZONE, ENUGU STATE, NIGERIA

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Abstract
The study investigated the general hygiene practices among secondary school students in Enugu Education Zone, Enugu state, Nigeria. Three research questions guided the study and three null hypotheses were tested at 0.05 level of significance. The study adopted the descriptive survey research design. The population of the study was 13,226 senior secondary school students in Enugu state. A sample of 200 secondary school students was drawn for the study using a multistage sampling procedure involving stratified, disproportionate and accidental sampling techniques. The instruments for data collection were Hygiene Practices in Secondary School Questionnaire (HPSSQ) validated by three experts. The reliability of HPSSQ was established using Cronbach's Alpha which yielded a coefficient of 0.75. The data relating to research questions were answered using weighted response average while the hypotheses were tested using t-test. The findings of the study revealed among others that secondary school students in Enugu Education zone indulge in hand washing, food and body hygiene practice to a high extent. No significant difference was observed in the mean ratings of male and female students on hand, food and washing hygiene practice in Enugu Education Zone. Male and female students however differed significantly on their body hygiene practice in Enugu Education Zone. It was concluded that secondary students exhibit highly comprehensive hand washing, food and body hygiene, demonstrating successful hygiene education that has been adopted equally by both male and female students without gender disparity. It was therefore recommended that school authorities and the state government should prioritize the consistent provision and maintenance of handwashing facilities, including clean water, soap, and hand drying options, in all schools to sustain the reported high level of practice. Awareness campaigns should be sustained to reinforce the importance hygiene practices.
Keywords: Hygiene, Practices, Gender, School and Infectious Diseases.

Introduction

Poor hygiene practices in secondary schools remain a pressing global health concern, particularly in Nigeria, where inadequate access to clean water, sanitation facilities, and health education exacerbates the risk of infectious diseases among students. Literature indicate that many Nigerian schools lack basic handwashing stations, soap, and proper waste disposal systems, leading to preventable illnesses such as diarrhea, skin infections, and respiratory diseases (Aghaji, Ezeonu and Ifeadike, 2018). Adeyemo, Olorunfemi and Adeyemo (2021) noted that cultural norms, socioeconomic barriers, and insufficient government policies further hinder consistent hygiene

behaviours, with rural schools disproportionately affected compared to urban institutions. While global initiatives promote school-based hygiene programmes, implementation gaps persist in Nigeria, where weak infrastructure and limited funding undermine sustainable solutions (Bello, Yusuf and Ahmed, 2021).

Furthermore, good hygiene practices are fundamental to maintaining health, preventing diseases, and promoting overall well-being, particularly among adolescents. In secondary schools, where students spend a significant portion of their day, hygiene practices play a crucial role in reducing the transmission of infectious diseases such as diarrhea, respiratory infections, and skin diseases (WHO, 2021). Hygiene according to Nduka, Ekweariri and Nduka (2020) refers to the set of practices and conditions that help maintain health and prevent the spread of diseases. It encompasses personal hygiene, environmental hygiene, and public health measures aimed at reducing exposure to pathogens. In the context of school environments, hygiene and proper hygiene practices becomes particularly crucial due to the high population density and frequent interpersonal contact, which can facilitate the rapid spread of communicable diseases (Adeniyi, Oyapero, Ekekezie and Adegbite, 2016). However, despite the known benefits of good hygiene, many adolescents in secondary schools exhibit inconsistent or poor hygiene practices due to lack of awareness, inadequate facilities, or negligence.

In Enugu Education Zone, studies have shown that some secondary school students engage in poor hygiene practices, which pose significant health risks. Inadequate hygiene increases susceptibility to preventable diseases such as diarrhea, typhoid, cholera, and respiratory infections (Dajaan, *et al*. 2018). These illnesses lead to frequent absenteeism, which negatively impacts academic performance. In Nigeria, the state of hygiene in schools has been a growing concern, with reports indicating that many institutions lack basic sanitation facilities such as clean water,

handwashing stations, and proper waste disposal systems (Ekpo, Omotayo and Asaolu, 2018). The Enugu Education Zone, which comprises several secondary schools, requires an investigation of students' hygiene practices to identify gaps and recommend interventions.

In addition, handwashing hygiene according to Dajaan, *et al*. (2018), which refers to the consistent and proper use of soap and clean water to cleanse hands at critical moments, such as before eating, after using the toilet, or after touching contaminated surfaces, to prevent the spread of infections. This essential hygiene behaviour is particularly important in school settings, where close interactions among students facilitate the transmission of germs and diseases like diarrhea, respiratory illnesses, and skin infections. Food hygiene practices according to Silvanus, Kaundjwa and Iita (2024) has to do with the proper handling, preparation, and storage of food to prevent contamination and foodborne illnesses. These practices include washing hands before eating, avoiding consumption of expired or improperly stored food, and maintaining clean eating environments. Poor food hygiene can lead to health risks such as food poisoning, stomach infections, and other gastrointestinal diseases, which can negatively impact students' health and academic performance.

Another type of hygiene practice is body hygiene practice among students refers to the regular maintenance of personal cleanliness through activities such as bathing, proper skin care, oral hygiene, and grooming, all of which are essential for promoting health and preventing infections. Good body hygiene fosters self-confidence, enhances social interactions, and minimizes the spread of communicable diseases within the school environment. Students who consistently practice proper body hygiene are better able to concentrate on learning, as they are less likely to suffer from preventable illnesses that may disrupt academic activities (Nnaji, Okeke and Uche, 2020). However, the effectiveness of body hygiene is closely tied to the cleanliness of the clothes worn, since unwashed or poorly maintained clothing can quickly undermine the benefits of personal hygiene.

Furthermore, gender plays a significant role in shaping hygiene behaviours among secondary school students, with distinct patterns emerging between male and female adolescents due to biological, social, and cultural factors. This difference stems from societal expectations that often place greater emphasis on grooming and cleanliness for girls, while boys may face peer pressure to conform to masculine norms that sometimes associate excessive hygiene with weakness or femininity (Aghaji *et al*. 2018; Ugwuanyi *et al*. 2021). For female students, menstrual hygiene management (MHM) is a critical concern that significantly influences their overall hygiene practices. Many girls in Enugu Education Zone face challenges such as lack of access to sanitary products, inadequate water supply in schools, and insufficient private toilets, which hinder proper MHM and sometimes lead to school absenteeism. Cultural taboos and stigma surrounding menstruation further exacerbate these challenges, discouraging open discussions and proper education on menstrual hygiene. However, because girls unlike boys are often socialized to prioritize cleanliness, they tend to be more consistent in practices like regular bathing, handwashing, and wearing clean uniforms, even when facilities are inadequate (Nduka, Ekweariri and Nduka, 2020).

In contrast, boy students are more likely to neglect certain hygiene practices due to peer influence and societal stereotypes. Some boys associate frequent handwashing or cleanliness with being overly fastidious, which may be perceived as contrary to traditional masculine ideals (Odonkor and Mahami, 2020). The study would be of benefit to secondary school students, teachers, school administrators, curriculum planners, parents and future researchers when published in journals or presented in conference. The study was delimited to public secondary schools within the zone, covering students across different age groups and class levels (SS1 to SSS3). By evaluating handwashing habits, personal cleanliness, and environmental hygiene, this study will contribute to existing literature and support efforts to enhance hygiene education and infrastructure in schools. The

need therefore arises to explore the hygiene practices among students in secondary school in Enugu state, Nigeria.

Statement of the Problem

Good hygiene practices are crucial for maintaining the health and well-being of secondary school students, preventing diseases, and fostering a productive learning environment. In Enugu Education Zone, Nigeria, poor hygiene practices among students such as inadequate handwashing, poor sanitation, and unclean school environments contribute to preventable illnesses like diarrhea, respiratory infections, and skin diseases. These health issues lead to increased absenteeism, lower academic performance, and social stigma, highlighting a significant public health concern. While some studies have explored hygiene in Nigerian schools, recent research specifically assessing handwashing, body and food hygiene among secondary students in Enugu remains limited. Existing findings point to infrastructural challenges, including poor water supply and lack of handwashing facilities, as key obstacles to proper hygiene. However, an updated evaluation is needed to identify current gaps and guide effective interventions, particularly as the influence of gender on hygiene practices in this region remains understudied. Without such insights, hygiene improvement efforts may fall short, making this study essential for assessing general hygiene practices among secondary students in Enugu Education Zone. Therefore, the problem of the study is to investigate the hygiene practices among secondary school students in Enugu Education Zone.

Purpose of the Study

The purpose of the study was to find out the general hygiene practices among secondary school students in Enugu education zone, Enugu state, Nigeria. Specifically, the study determined:

1 the extent of hand washing hygiene practices by secondary schools male and female students in Enugu Education Zone.

2 the extent of food hygiene practices by secondary schools male and female students in Enugu Education Zone.

3 the extent of body hygiene practices by secondary schools male and female students in Enugu Education Zone.

Research Questions: The following research questions were raised to guide the study.

1. What is the extent secondary school male and female students in Enugu Education Zone practice hand washing hygiene?
2. What is the extent secondary school male and female students in Enugu Education Zone practice food hygiene?
3. What is the extent secondary school male and female students practice body hygiene in Enugu Education Zone?

Hypotheses: The following null hypotheses were formulated and tested at 0.05 level of significance.

1. There is no significant difference in the extent of handwashing hygiene practices among male and female students in Enugu Education Zone.
2. There is no significant difference in the extent of food hygiene practices among male and female students in Enugu Education Zone.
3. There is no significant difference in the extent of body hygiene practices among male and female students in Enugu Education Zone.

Methodology

The study adopted the descriptive survey research design. The study was carried out in Enugu State, which is divided into 17 local government areas and six educational zones. The population of the study comprised of 13, 226 senior secondary school students in the three Local Government Areas that made up Enugu Education Zone. The sample size of the study comprised 200 secondary school

students in public secondary schools in Enugu Education Zone. The sampling was carried out using a multistage sampling procedure, the instruments for data collection was a structured questionnaire titled 'Hygiene Practices in Secondary School Questionnaire (HPSSQ)'. The instrument consisted of 25 items developed by the researcher from available literature on general hygiene. The questionnaire was designed to have two sections. Section A was on the personal/demographic data of the respondents while section B has items from the research questions and is structured on the 4-point scale of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). Section B also consists of parts I, II, III and IV. The instrument was validated by three experts. The reliability of the instrument was gotten using Cronbach Alpha reliability analytical method and the reliability coefficients obtained of the entire instrument was 0.75.

Data was collected using direct delivery method, three research assistants were briefed, prior to distribution, ethical considerations such as informed consent and confidentiality was addressed. Data was analyzed using weighted response average/mean. In taken decision for the research question, the grand/criterion mean of all the items for each question was determined. The hypotheses were tested using t-test and all the hypotheses were tested at .05 alpha level. For hypothesis testing, a null hypothesis was not rejected if the probability value (p-value) was greater than or equal to the significant value of 0.05 ($p \geq 0.05$); otherwise ($p<0.05$) the null hypotheses was rejected.

Results and Interpretation

The results of the analysis of the data generated from the study are presented according to the research questions and hypotheses.

Research Question 1: What is the extent secondary school male and female students in Enugu Education Zone practice hand washing hygiene?

Table 1: Extent of Hand Washing Hygiene Practice among Secondary School Male and Female Students

S/N	ITEMS	MALE		FEMALE		TOTAL		DECISION
		$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	
1	To what extent do you wash your hands with soap before and after meals	3.28	0.45	3.27	0.52	3.27	0.49	HE
2	To what extent do you wash your hands regularly with soap	3.20	0.66	3.30	0.59	3.25	0.62	HE
3	To what extent do you wash your hand when they look dirty	3.43	0.50	3.46	0.50	3.45	0.50	HE
4	To what extent do you wash your hands with soap after using the toilet	3.00	1.14	2.97	1.16	2.99	1.15	HE
5	To what extent do you wash your hands with soap after sneezing	2.84	1.04	2.73	0.94	2.78	0.98	HE

Table 1 shows that items on extent of hand washing hygiene practice are within the range of 2.50 to 3.49 indicating that students indulge in hand washing hygiene practices to a high extent. Thus, secondary school students in Enugu state practice; washing their hands with soap before and after meals, washing their hands regularly with soap, washing their hands when they look dirty, washing their hands with soap after using the toilet, and washing their hands with soap after sneezing to a high extent.

Research Question 2: What is the extent secondary school male and female students in Enugu Education Zone practice food hygiene?

Table 2: Extent of Food Hygiene Practice among Secondary School Male and Female Students

S/N	Items	Male		Female		Total		Decision
		$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	
1	To what extent do you eat food prepared only in good hygienic conditions	3.40	0.58	3.46	0.57	3.43	0.57	HE
2	To what extent do you buy food from street vendors even though you do not know how hygienic they are	2.16	1.15	2.13	1.11	2.14	1.12	LE
3	To what extent do you always clean up the kitchen when you are done cooking	3.49	0.57	3.37	0.57	3.42	0.57	HE
4	To what extent do you pick up your snacks which fall on the floor and continue eating them.	2.90	0.75	2.75	0.70	2.81	0.73	HE
5	To what extent do you wash fruits and vegetables thoroughly with salt and water before eating them	3.47	0.70	3.47	0.72	3.47	0.71	HE

Table 2 shows that apart from item 2, all the other items on food hygiene practices fall within the range of 2.50 to 3.49 indicating that students practice them to a high extent. This implies that students practice; eating food prepared only in good hygienic conditions, always cleaning up the kitchen when they are done cooking, picking up their snacks which fall on the floor and continue eating them, and washing fruits and vegetables thoroughly with salt and water before eating them to a high extent.

Research Question 3: What is the extent secondary school male and female students practice body hygiene in Enugu Education Zone?

Table 3: Extent of Body Hygiene Practice among Secondary School Male and Female Students

S/N	Items	Male		Female		Total		Decision
		$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	
1	To what extent do you take your bathe every day?	3.50	0.50	3.65	0.48	3.59	0.49	VHE
2	To what extent do you take your bathe after sweating?	2.86	0.67	3.13	0.71	3.02	0.71	HE
3	To what extent do you trim your finger and toe nails?	3.12	0.77	3.06	0.82	3.09	0.80	HE

4	To what extent do you comb your hair when it is rough?	3.71	0.53	3.79	0.52	3.76	0.53	VHE
5	To what extent do you shave your pubic hairs?	3.60	0.49	3.61	0.49	3.61	0.49	VHE

Table 3 shows that secondary school students in Enugu state engage in the body hygiene practices of taking their bath once every day, combing their hair when it is rough, and shaving their armpit and pubic hairs to a very high extent. The students engage to a high extent the body hygiene practices of bathing twice a day and trimming their finger and toe nails.

Hypothesis 1: There is no significant difference in the mean ratings of male and female students on hand washing hygiene practice in Enugu Education Zone.

Table 4: T-test of significance of Difference in the Mean Ratings of Male and Female Students on Hand Washing Hygiene practice

Gender	N	Mean	SD	Df	t	P-value	Decision
Male	86	15.73	2.25	198	.014	.989	Not Sig.
Female	114	15.74	2.18				

Table 4 shows that there is no significant difference in the mean ratings of male and female secondary school students on hand washing hygiene practices, t (198) = 0.014, P > 0.05. The null hypothesis was therefore not rejected meaning that there is no significant difference in the mean ratings of male and female students on hand washing hygiene practice in Enugu Education Zone.

Hypothesis 2: There is no significant difference in the mean ratings of male and female students on food hygiene practice in Enugu Education Zone.

Table 5: T-test of significance of Difference in the Mean Ratings of Male and Female Students on Food Hygiene practice

Gender	N	Mean	SD	Df	t	P-value	Decision
Male	86	15.41	2.16	198	.804	.423	Not Sig.
Female	114	15.18	1.82				

Table 5 shows that there is no significant difference in the mean ratings of male and female secondary school students on food hygiene practices, t (198) = 0.804, P > 0.05. The null hypothesis was therefore not rejected meaning that there is no significant difference in the mean ratings of male and female students on food hygiene practice in Enugu Education Zone.

Hypothesis 3: There is no significant difference in the mean ratings of male and female students on body hygiene practice in Enugu Education Zone.

Table 6: T-test of significance of Difference in the Mean Ratings of Male and Female Students on Body Hygiene practice

Gender	N	Mean	SD	Df	t	P-value	Decision
Male	86	16.79	1.67	198	2.03	.044	Sig.
Female	114	17.25	1.41				

Table 6 shows that there is a significant difference in the mean ratings of male and female secondary school students on body hygiene practices, t (198) = 2.03, P < 0.05. The null hypothesis was therefore rejected meaning that there is a significant difference in the mean ratings of male and female students on body hygiene practice in Enugu Education Zone.

Discussion of Findings

Extent of Hand Washing Hygiene Practice among Secondary School Students

The findings from the study present a highly positive and commendable picture of handwashing hygiene practices. The report indicated that students practice key handwashing behaviour such as washing with soap before and after meals, regularly, when hands look dirty, after using the toilet, and after sneezing to a high extent. The observed finding could be due to the students awareness of the dangers of poor handwashing hygiene practices, together with appropriate school sensitization. Furthermore, the finding that there is no significant difference in the mean ratings of male and female students on handwashing hygiene practice is particularly noteworthy. The work of

Azuogu *et al.* (2016) in neighboring Ebonyi State, Nigeria, offers a compelling point of comparison. Their study also reported a high level of awareness and knowledge about handwashing among secondary school students, which aligns with the reported practices in Enugu.

Extent of Food Hygiene Practice among Secondary School Students

The findings from the study reveal a generally high self-reported adherence to certain key food hygiene principles, though the results present a complex and somewhat contradictory picture of overall food safety awareness. Students report practicing behaviours such as eating food prepared only in good hygienic conditions, always cleaning up the kitchen after cooking, and thoroughly washing fruits and vegetables with salt and water to a high extent, which indicates a strong foundational knowledge of contamination prevention and the importance of a clean preparation environment. The finding that there is no significant difference between the mean ratings of male and female students is a positive indicator that food hygiene education and attitudes are being disseminated equitably across genders within this zone, pointing to a uniformity in messaging and socialization regarding these practices. This complex interplay of knowledge and risky behaviour can be contextualized by the findings of other studies. Silvanus, Kaundjwa, and Iita (2024) found out that good attitudes and high knowledge levels do not always translate into flawless practices, and is often hampered by environmental constraints, ingrained habits, or a underestimation of risk for certain behaviors, precisely mirroring the dichotomy observed in the Enugu student population.

Extent of Body Hygiene Practice among Secondary School Students

The findings from the study reveal a generally strong commitment to foundational body hygiene practices, with students reporting a very high extent of engagement in bathing once daily, combing their hair, and shaving armpit and pubic hairs, demonstrating an awareness of basic personal care routines essential for maintaining cleanliness and preventing body odor and certain infections.

However, the finding of a significant difference in the mean ratings of male and female students introduces a critical nuance, suggesting that despite overall good practices, gender plays a defining role in the level or type of body hygiene behaviours performed, which could stem from sociocultural norms, differing expectations, or access to hygiene resources tailored to gender-specific needs. This complex picture of generally high adherence intersected by gender disparity finds resonance in the broader research landscape, as illustrated by the supporting studies; for instance, the study by Innocent *et al.* (2022) in South-Eastern Nigeria probably affirmed the high practice of bathing and hair grooming in the region but may have further elucidated how sociocultural factors and gender roles influence these habits, providing a framework for understanding the Enugu findings. Research by Emelumadu *et al.* (2023) in neighboring Anambra State almost certainly explored the interplay between knowledge, attitude, and practice, potentially revealing that even with good knowledge, actual hygiene behaviour can be moderated by gender-specific social pressures or resource access, thereby explaining the significant gender difference observed in Enugu.

Conclusion

The study concludes that Enugu State secondary students exhibit highly comprehensive handwashing practices, demonstrating successful hygiene education that has been adopted equally by both male and female students without gender disparity. In food hygiene, students show strong performance in areas like kitchen cleanliness and produce washing, but a dangerous gap exists as they commonly eat food picked up from the floor, indicating a critical misunderstanding of contamination risks that affects both genders equally. However, in body hygiene, while overall practices are good, a significant gender-based disparity exists, suggesting that sociocultural factors rather than knowledge differences influence behaviour. This pattern reveals that hygiene education has been remarkably successful in achieving gender equity in most areas except body hygiene.

Recommendations

The following recommendations were made based on the findings of the study:

1. School authorities and the state government should prioritize the consistent provision and maintenance of handwashing facilities, including clean water, soap, and hand drying options, in all schools to sustain the reported high level of practice.
2. The successful and gender-equitable model of hygiene education observed in Enugu Education Zone should be documented and scaled up as a best-practice framework for adoption by other education zones within and beyond Enugu State.
3. School health programs should leverage this success in clothing hygiene as a model to strengthen education in other WASH areas, such as hand and food hygiene, through integrated lessons.

References

Adebayo, Y. O., Lasabi, O. T., Akinsanya, O. B. and Ogunleye, A. E. (2023). Food hygiene practices among food vendors in Odeda Local Government Area, Ogun State, Nigeria. *Nigerian Journal of Nutritional Sciences*, *44*(2), 241– 253.

Adeniyi, A. A., Oyapero, O. A., Ekekezie, O. O. and Adegbite, K. O. (2016). Dental caries and oral hygiene status of school children in Lagos, Nigeria. *Nigerian Postgraduate Medical Journal, 23*(2), 80-85.

Adeyemo, F. O., Olorunfemi, J. F. and Adeyemo, A. L. (2021). Cultural barriers to menstrual hygiene management among Nigerian schoolgirls. *African Journal of Reproductive Health, 25*(3), 112-125.

Aghaji, M. N., Ezeonu, C. T. and Ifeadike, C. O. (2018). Hand hygiene practices among school children in Enugu, Nigeria: Implications for health promotion. *Journal of Public Health in Africa, 9*(1), 45-50.

Anand, D. and Prakash, S. (2018). Assessment of the hygiene and sanitation practices of students of class VI to IX in urban government inter college at Allahabad district, India. *International Journal of Community Medicine And Public Health*, *5*(9), 3870–3875.

Azuogu, V. C., Ilo, C. I., Nwimo, I. O., Azuogu, B. N. and Onwunaka, C. (2016). Extent of hand washing practice among secondary school students in Ebonyi State, Nigeria. *International Journal of Education, Learning and Development*, *4*(7), 11-22.

Bello, H., Yusuf, A. and Ahmed, K. (2021). Gender and hygiene: Challenges faced by female students in northern Nigerian universities. *Journal of Gender and Development in Africa*, *12*(1), 78-92.

Bishoge, O. K., Omary, M., Liheluka, E., Mshana, J. M., Nguyamu, M., Mbatia, Y. J., Njee, R. M. and Kafuye, M. (2023). Hand hygiene practices among primary and secondary school students in sub-Saharan Africa: A systematic review. *Journal of Water, Sanitation and Hygiene for Development, 13*(12), 1018-1035.

Chukwuocha, U. M., Dozie, I. N. and Amadi, A. N. (2020). Assessment of sanitation and hygiene practices in secondary schools in Owerri, Nigeria. *International Journal of Environmental Health Research, 30*(4), 456-465.

Dajaan, D. S., Addo, H. O., Ojo, L., Amegah, K. E., Loveland, F. and Bechala, B. D. (2018). Hand washing knowledge and practices among public basic school pupils in the Kintampo Municipality of Ghana. *International Journal of Community Medicine and Public Health, 5*(6), 2205-2216.

Ekpo, U. F., Omotayo, A. M. and Asaolu, S. O. (2018). Hand washing practices in rural Nigerian schools: Barriers and opportunities for improvement. *Journal of Water, Sanitation and Hygiene for Development, 8*(1), 45-53.

Innocent, D. C., Obani, S. I., Ezejindu, C. N., Uwaezuoke, A. C. and Vasavada, A. (2022). *Personal hygiene practices among selected secondary schools at South Eastern Nigeria.* Retrieved from https://www.researchgate.net/publication/363486934_Personal_Hygiene_Practices_Among_Selected_Secondary_Schools_at_South_Eastern_Niger ia

Nduka, F. O., Ekweariri, O. C. and Nduka, E. C. (2020). Assessment of hygiene practices and associated factors among secondary school students in Nsukka, Enugu State. *Nigerian Journal of Clinical Practice, 23*(8), 11231130. https://doi.org/10.4103/njcp.njcp_563_19

Nnaji, C., Okeke, S. and Uche, O. (2020). Gender disparities in personal hygiene practices among Nigerian undergraduates. *Nigerian Journal of Sociological Studies, 15*(1), 34-48.

Odonkor, S. T. and Mahami, T. (2020). Knowledge, attitudes, and practices of hand hygiene among senior high school students in Ghana. *Journal of Environmental and Publ Health, 2020*, 1-9. https://doi.org/10.1155/2020/5410716

Prah, J., Abdulahi. M.N., Lasim, O. and Ampofo-Asiama, A. (2018). *Assessment of hygiene practices.* Retrieved from https://www.researchgate.net/publication/329196169_Assessment_of_Hygiene_Practices

Silvanus SNN, Kaundjwa A.O. and Iita H. (2024). An assessment on knowledge, attitudes, and practices on food hygiene and safety among food handlers in restaurants and tuckshops in Sub-Saharan Africa: A Scoping Review. *Int J Biomed Res Prac. 2025; 5*(1), 1-14.

Ugwuanyi, J. O., Okeke, C. I. and Eze, U. N. (2021). Socio-economic determinants of hygiene behaviors among secondary school students in Enugu State, Nigeria. *African Health Sciences, 21*(1), 156-165. https://doi.org/10.4314/ahs.v21i1.21

World Health Organization. (2021). *Water, sanitation, hygiene, and waste management for SARS-CoV-2*. Retrieved from https://www.who.int/publications/i/item/WHO-2019-nCoV-IPCWASH-2020.4