

Perceived Influence of Hostel Sanitation Practices on Students' Health at the University of Nigeria, Nsukka

Nwadi, C.L.¹; Attah, B.I.¹; Ugwu, E.I.¹; Nwakpadolu, G.M.²; & Ezekoye, R.O.¹

¹Department of Home Economics and Hospitality Management Education,
University of Nigeria, Nsukka

²Micheal Okpara University of Agriculture, Umudike

Correspondence: ijeoma.attah@unn.edu.ng

Submitted - August 6, 2023, Final revision - October 2, 2023, Accepted - October 2, 2023

Abstract

This study investigated the perceived influence of hostel sanitary practices on students' health at the University of Nigeria, Nsukka. Three objectives guided the study. The study design was a cross-sectional survey. The population for the study was the 7129 assigned occupants of the 16 hostels in UNN out of which 160 respondents were randomly selected. A structured questionnaire was used for the data collection and the data were analyzed using means and standard deviations. The findings showed that the causes of poor hostel sanitary practices were water scarcity (mean=3.58), lack of hygiene instruction (mean=3.13) and lack of garbage containers for disposing of waste (mean=3.8). The findings also showed that strategies/measures to improve sanitation include: controlling overcrowding of students in each room (mean 3.56). The university authorities should provide waste disposal cans (mean= 3.07) and hygiene instructions (mean=3.56) should be provided for students. Also, the study found that the perceived health implications of poor sanitary practices were food poisoning (mean=3.50), depression (mean=3.8), diarrhoea (mean=3.28), cholera (3.59), and skin irritation(mean=3.50). The recommendations are that wash-related materials and agents should be regularly supplied to ensure quality cleaning services, also toilet cleaning checklist be introduced to ensure quality cleaning services by cleaning professionals, low-cost menstrual hygiene-related disposal materials placed in existing buildings in female hostels and there should be a participation of students in environmental sanitation.

Keywords: Influence, Hostel, Sanitation practices, Students, Health.

Introduction

Sanitation is associated with man's existence and it is an essential part of living. Sanitation when carried out very well promotes hygiene, prevents any form of diseases and infections that occur due to a dirty environment, and leads to a healthy lifestyle. Students'

hygiene depends largely on the sanitary conditions of their environment which will prevent diseases (Uchegbu, 2000; WHO 2020). A student is a person enrolled in a school, college, university, or otherwise under the supervision of an educational activity and seeks

instruction from teachers (Garner 2019). Male and female undergraduate students of universities are usually between the ages of 18 and 27; an age bracket often referred to as the age of “emerging adulthood”(Arnett, 2000). During this time the development of self-identity, changing support systems, and the shifting of interpersonal influences occur and set this life stage apart from adolescence and adulthood (Nelson et al., 2008). It is a period young people begin to develop lifelong views and behaviours. Many individuals in this category are undergraduate students who live in hostels. There is a need for these students to adopt proper sanitation practices in the hostels to ensure healthy living.

A hostel is a lower-priced inn of sorts that offers basic, shared accommodations. Typically, a hostel features a large room with separate beds, a shared bathroom, and a communal kitchen. Some hostels have private rooms, but the lower-cost ones generally offer bunk beds. Hostels originated in Europe, but have grown in popularity and are found all over the world(Forever, 2022). A hostel is a place where economical, healthy and safe accommodation is supposed to be provided for the students of a school or college (Uddin, 2019). However, living conditions in most hostels are far less comfortable than that at home. Lack of hygiene education, overcrowding, poor supervision and so on may cause poor hostel sanitation. The unhygienic living conditions may also cause a lot of students to have health problems like indigestion (Uddin, 2019). Hygiene is

the practice of keeping oneself and surroundings clean to prevent infection, and disease and remain healthy and fit. Students who stay in hostels are more likely to practice good hygiene because there are more people around to transfer germs and a wider range of diseases which are perceived influences of poor sanitation practices.

Students and school authorities can contribute towards maintaining good hygiene and sanitation by playing their roles efficiently. For students to be comfortable and live healthily they should make adequate use of every sanitation facility provided by school authorities and ensure that where they live in the hostel is always kept clean (Uttaranchal, 2022). However, poor hostel sanitation practices at the University of Nigeria Nsukka have been observed by the researcher. The waste disposal system was very poor, resulting in students providing themselves with personal and portable garbage bins for disposing of their waste. Most students also use personal portable buckets to ease themselves rather than make use of the unsanitary toilet facilities in the hostels. These practices could lead to the easy spread of infectious diseases among students. This concern has motivated this study on the perceived influence of hostel sanitation practices on students’ health at the University of Nigeria Nsukka.

Purpose of the study: The main purpose of the study was to investigate the Influence of Hostel Sanitation Practices on Students’ Health at the University of Nigeria. Specifically, the study determined the:

1. causes of poor sanitation practices in students' hostels;
2. perceived influence of poor sanitation practices on the health of the students and
3. measures and plans by students and school authorities to improve hostel sanitation practices.

Methodology

Study design: The study adopted a survey research design. This design according to Nworgu and Yager (2006) is one in which a group of people is studied by collecting and analyzing data from only a few people considered to be representatives of the entire group. This design was chosen because it is ideal for getting the needed responses on the perceived influence of hostel sanitation practices on students' health at the University of Nigeria Nsukka.

Study population: The population for the study consisted of all the 2,129 male and female students in the 16 hostels at the University of Nigeria Nsukka campus. This population was obtained based on the number of bed spaces in the hostels.

Sample size selection procedure: To determine the sample for the study, the Taro Yamane formula; $n = N / 1 + N(e)^2$ was used where;

n = sample size

N = population size,

e = precision or sampling error (0.05)

This gave a sample size of 337 students who were then selected using simple random selection without replacement.

Instrument for data collection: The instrument for data collection was a

structured questionnaire titled "Influence of Hostel Sanitation Practices on Students' Health". The questionnaire was structured into section A-C which sought information on the three objectives of the study, Section A obtained data on the causes of poor hostel sanitation practices. Section B contained items on the perceived influence of hostel sanitation practices on students' health. Section C was used to identify measures and plans to improve the sanitation practices of students.

Validation and reliability: The questionnaire was face-validated by three experts, two from the Department of Home Economics and Hospitality Management Education and one from the Student Affairs Department of the University of Nigeria Nsukka. They made careful judgments of the questionnaire and ascertained that the content of the instrument covered the objectives of the study. Their criticism and suggestions were used to produce the final version of the instrument.

Method of data collection: The researchers administered 337 copies of questionnaires to the respondents. The instrument was administered to each respondent through contact by hand distribution. All the copies were completed, collected back on the spot and used for analysis.

Data and statistical analysis: The data collected from the respondents were analyzed manually using the mean. The mean is represented by the formula $\mu = \sum fx / n$ where μ = mean

X= nominal value to the scale point. F = the number of respondents for each response category. N= the total number of respondents in the item questions. Σ = sum of fx. The nominal values assigned to the different scales were as follows: SA = 4, A = 3, D = 2, SD = 1 Total = 10. Using the formula $\mu = 10/4 = 2.5$, the decision rule was that any mean response of 2.5 and above would be accepted, while the item mean score below 2.5 was not accepted.

Results

Demographic characteristics of the respondents

The respondents were made up of 59.3% female and 40.7% male students within the age range of 18 to 30 years.

Causes of poor sanitation practices

Table 1 shows the perceived causes of poor hostel sanitation practices at the University of Nigeria Nsukka. Data showed that the causes of poor hygiene practices included overcrowding (mean = 4.19), water scarcity (mean = 3.58), indiscriminate dumping of refuse (mean = 3.56), poor supervision of employed cleaners (mean = 3.25), lack of hygiene education (mean = 3.13) and insufficient waste bins for disposing of wastes (mean = 3.00). The item “inadequate funds to provide sanitation equipment and facilities” was not accepted as a cause of poor hygiene practices (mean < 2.50).

Table 1: Mean responses on the causes of poor hostel sanitation practices

Item Statement	SA	A	D	SD	Sum	Mean	Decision
Water scarcity	100	53	7	0	573	3.58	Agreed
Lack of hygiene education	60	70	20	10	500	3.13	Agreed
Insufficient waste bins for disposing of waste	50	80	10	20	480	3.00	Agreed
Inadequate funds to provide sanitation equipment and facilities.	20	40	50	50	350	2.19	Disagreed
Indiscriminate dumping of refuse on the hostel premises	90	70	0	0	570	3.56	Agreed
Overcrowding	60	50	30	20	670	4.19	Agreed
Poor supervision of employed cleaners	70	60	30	0	520	3.25	Agreed

N=337, , A= agree, D= disagree, SD = strongly disagree,

Table 2 shows the perceived influence of poor hostel sanitation practices on the health of students. They include; food poisoning (mean = 3.56), depression (mean =3.18), diarrhoea (mean =3.28), cholera (mean =3.59),

and skin irritation (mean =3.50). The respondents did not agree that headaches, fatigue and allergies were related to poor sanitation practices (2.47).

Table 2: Mean responses on the perceived influence of poor hostel sanitation practices on the health of students.

Item Statement	SA	A	D	SD	Sum	Mean	Decision
Food poisoning due to unwashed plates, cutleries and pots.	63	90	20	7	569	3.56	Agreed
Depression or anxiety symptoms if not taken care of properly	74	66	7	0	508	3.18	Agreed
Diarrhoeal	64	81	10	5	524	3.28	Agreed
Skin irritations	76	82	4	2	560	3.50	Agreed
Headaches, fatigue and allergies	35	46	38	41	395	2.47	Disagreed
Cholera	91	69	0	0	574	3.59	Agreed

N=377, A= agree, D= disagree, SD = strongly disagree,

Table 3 shows measures that could be taken by students to improve hostel sanitation practices. Data showed that the measures include; garbage management(mean=3.30), promoting good hygiene habits through education (mean = 2.93), proper washing of hands (mean =3.34), proper cleaning of rooms and corridors (mean =3.53), making demands for sanitation services(mean =3.08), making good use

of waste bins(mean. =3.66), spraying of insecticides and fungicides to reduce the spread of disease and infection-causing agents(mean =3.29), proper use of facilities provided by the school authorities(mean =3.38). All these means were above the cut-off point of 2.50 and the item “making good use of waste bins’ was considered the most important strategy.

Table 3: Mean responses on measures and plans that could be taken by students to improve hostel sanitation practices

Item Statement	SA	A	D	SD	Sum	Mean	Decision
By garbage management	78	62	10	10	528	3.30	Agreed
Promoting good hygiene habits through education	43	77	26	14	469	2.93	Agreed
Proper washing of hands with soap and water after visiting the toilet	69	81	6	4	535	3.34	Agreed
Proper cleaning of the rooms, corridors & surroundings	84	76	0	0	564	3.53	Agreed
Making demands for sanitation services.	62	58	30	10	492	3.08	Agreed
Making good use of the waste bins for disposing of waste properly	76	94	0	0	586	3.66	Agreed
Spraying of insecticides and fungicides to reduce the spread of disease and infection-causing agents.	64	83	8	5	526	3.29	Agreed
Proper use of facilities provided by the school authorities	80	60	20	0	540	3.38	Agreed

N=337, X= mean, A= agree, D= disagree, SD = strongly disagree,

Table 4 shows measures that could be taken by school authorities to improve hostel sanitation practices. Data showed that the measures that could be taken by school authorities to improve hostel sanitation practices include: promoting good hygiene through extensive education (mean =3.56) provision of enough waste bins all over the halls of residence (mean = 3.07) controlling the overcrowding of students and facilities (mean = 3.56) and proper supervision of employed

cleaners (mean = 3.25), were above the cut-off mark of 2.50 and were termed as agreed. While the provision of sufficient toilets and latrine facilities (mean =1.98) ensuring constant water supply in the hostel (mean = 2.41), the provision of adequate well-functioning toilets and latrine systems (mean = 1.18), and provision of funds for sanitation equipment and facilities (mean = 2.19), were below the cut-off point of 2.50 and were termed as disagreed.

Table 4: Mean responses on the Measures and plans by School Authorities to improve hostel sanitation practices

Item Statement	SA	A	D	SD	Sum	Mean	Decision
Promoting good hygiene through extensive education	90	70	0	0	570	3.56	Agreed
Provision of enough waste bins all over the halls of residence	57	61	38	4	491	3.07	Agreed
Provision of sufficient toilets and latrine facilities	23	14	52	71	309	1.93	Disagreed
Ensuring constant water supply in the hostel	47	10	64	39	385	2.41	Disagreed
Provision of adequate well-functioning toilets and latrine systems	10	29	41	80	189	1.18	Disagreed
Provision of funds for sanitation equipment and facilities	20	40	50	50	350	2.19	Disagreed
Controlling the overcrowding of students in each room	90	70	0	0	570	3.56	Agreed
Proper supervision of employed cleaners	70	60	30	0	520	3.25	Agreed

N=337, X= mean, A= agree, D= disagree, SD = strongly disagree,

Discussion

The finding of this study revealed that the perceived causes of poor hostel sanitation practices included water scarcity, lack of hygiene education, not enough waste bins and overcrowding. Water scarcity may be defined as a lack of safe water supplies. As the population of the world grows and the environment becomes further affected by climatic change, access to safe water dwindles. According to Hutton (2017), an estimated 502.000 deaths are associated with scarcity of water. Lack of access to adequate water supply in students' hostels leads to poor sanitation and hygiene services. For instance, the water closet toilets might not be properly cleaned after use, the practice of handwashing might not be regularly observed, and the sewage systems might even fail to function. These unhygienic conditions consequently could lead to increased risks of diarrhoea, skin infections and other communicable diseases.

Poor hygiene education could also lead to poor sanitation. The biggest cause of poor sanitation globally is simple lack of education, for example, the simple act of washing hands regularly, can have a huge impact on the overall health of a community (Abanyie2022). The problem of personal hygiene could lead to hygiene-related diseases like diarrhoea, body lice, hair lice and so on. Globally, the high mortality and morbidity due to communicable diseases among students have been attributed to neglect of personal hygiene. Students need to be taught and be educated by lecturers and hostel administrators to be able to adopt certain behaviours as regards their

health and well-being, thus poor hygiene education might lead to poor sanitation.

Inadequate waste disposal caused by insufficient wastebins in hostels drives the infection circle of many bacteria and other germs that can spread through contamination and may lead to poor sanitation. Poor waste management ranging from an inadequate collection system to ineffective disposal by students causes water and environmental pollution leading to poor sanitation in the hostels (Hutton, 2017). Furthermore, overcrowding occurs when a species population exceeds the carrying capacity and may result in poor ventilation. Specifically, overcrowding leads to poor sanitation by increasing the risk of infection as the number of potential transmitters is increased. Overcrowding may lead to close-contact infectious diseases such as gastroenteritis and diarrhoea diseases. These findings were in agreement with Musa and Haque (2016) who found similar factors causing poor sanitation practices in student hostels. Mangrio and Zdravkovic (2018) also found that overcrowding could be associated with poor mental health.

The finding of the study revealed the perceived influence of poor sanitation practices on the health of students. According to the respondents, poor sanitation practices can negatively affect students' health in such ways as food poisoning from dirty dishes, cutlery, and pots; undiagnosed depression or anxiety symptoms and skin irritations. The hostel should constantly be kept clean and organized to minimize these influences. Nwobi (2022) revealed that adequate hostel

sanitation practices of undergraduates contribute greatly to improved health status in the university. The finding was also similar to Mara et al. (2010) who revealed that most people die from diarrhoea diseases, especially children. The author stated that diseases are often caused when germs get into drinking water or unkept foods as a result of poor sanitation practices. Poor sanitation is characterized by poor solid waste disposal techniques and inadequate sanitation facilities. This is associated with perceived diseases such as food poisoning, depression, diarrhoea, skin, irritation, cholera, typhoid, malaria and dysentery. Therefore, there is a need to encourage the public especially students to participate in the proper handling of waste and hygiene standards.

The result of this study was also similar to the studies of Ogbonna et al. (2007) and Uganda (2022) which were in agreement with the findings on the perceived health effect of poor sanitation. With the advent of COVID-19, Poague et al. (2022) and other researchers (Hyun et al., 2019; Kaminsky & Jordan, 2017; McGranahan, 2015; Sangalang et al., 2022) suggested a slightly different and thorough approach to cleanliness and sanitation amongst students especially in developing countries. While every person on the planet needs clean water, dignified sanitation and healthy hygiene practices, there are a variety of approaches and interventions that can be taken to help students have safe, convenient, reliable and sustainable wash facilities and services. The authors stated some of the approaches and interventions as menstrual hygiene management, integrated water resource management, hygiene behaviour change,

and washing in emergencies. Jasper (2002) also explained below, how these strategies work. The Water Sanitation Hygiene (WaSH) and COVID-19 Strategy, work by improving handwashing behaviour, food hygiene and safe water practices by providing materials for handwashing and hygiene. Hygiene practices can be measured by observing behaviours such as handwashing, proper use of latrines, and effective monitoring. Also, sanitation and hygiene advocacy and communication strategy framework focus on sanitation, hygiene behaviours building, the use of toilets, disposal of faeces and washing. The communication initiatives World Health Organization (WHO) works with partners on promoting effective risk assessment and management practicals for sanitation in communities and health facilities. The author stressed how these strategies can help to improve hostel sanitation practices of students and their health by first, providing more support to local-level sanitation plans and strategies. Second, do more work on faecal sludge monitoring and management. Third, communicate the benefit of unresting in sanitation to schools in communities by supporting small-scale water and sanitation projects. The project can also include the construction of community school toilets, installation of handwashing stations and promotion of hygiene education, ensuring pipe water supply, behaviour change and community-led total sanitation in schools and hostels.

The finding further showed measures by which students could improve hostel sanitation practices which included utilizing and maintaining waste bins for proper disposal of refuse, washing and

cleaning the toilets, promoting good hygiene habits through sensitization and health education, proper hand washing with soap and water after using the toilet room, and proper cleaning of the rooms, corridors, and surroundings. These strategies work to improve sanitation and health by educating and maintaining basic rules for sanitation like students washing hands regularly with soap and warm water whenever they become soiled because of the removal action of water and soap on transient microorganisms. Proper hand washing with soap and water can reduce diarrhoea cases by up to 35% (Musunguzi & Tumushabe, 2018). Proper disposal of refuse will not only protect the environment but recycling or reusing these wastes benefits the environment by lessening the need to extract resources and lowering the potential for contamination thereby improving sanitation and health. Also, students should practice proper cough and sneeze etiquette. The results of this study also were in agreement with the findings of the following researchers (Emerson et al., 2004; Groce et al., 2011; Musa & Haque, 2016 & Rajaratnam et al., 1992) who concurred that the remedial methods of improving sanitation require supporting the local level sanitation plans and strategies, faecal sludge monitoring and management, and communicating to students/communities the benefits of investing in sanitation

Some measures and plans by school authorities to improve hostel sanitation practices in the university were also revealed. The school administrators may be able to help solve the problem of poor sanitation practices in the student hostels by

providing adequate trash cans throughout the halls of residence and overseeing cleaners to keep the residences clean and lively. Also, promoting good hygiene through extensive education, provision of sufficient toilets and latrine facilities, ensuring constant water supply in the hostel and provision of adequate well-functioning toilets and latrine systems. These strategies could help to improve the hostel sanitation and practices of students and their health if school administrators adhere to these methods and students utilize them in synergy instead of in isolation. By utilizing these strategies by students and authorities, the menace of poor sanitation and its negative effects on students' health can be stopped or at least reduced to a manageable level. Some perceived effects of infections and diseases such as food poisoning, depression, diarrhoea, skin irritation, cholera, typhoid, malaria and dysentery are reduced or stopped when residential areas are clean and hygiene is promoted. Therefore, these could help to improve the hostel sanitation practices of students and their health. The following researchers (Chard et al., 2019; Sharma & Adhikari, 2022; Snel et al., 2000; Tayler, 2020) concurred that school administrators should be fully involved in ensuring that students engage in healthy sanitation practices. Tayler (2020) also suggested other methods of improving sanitation practices in schools as creating structures for layering the intervention, sensitizing keyholders through capacity building, and reaching out to students/communities through awareness campaigns.

Conclusion

The study revealed that the causes of poor hostel sanitation practices included water scarcity, lack of hygiene education, insufficient waste bins, and overcrowding. These factors could lead to poor health conditions such as food poisoning, depression, diarrhoea, skin irritation, allergies, and cholera. However, some measures to improve hostel sanitation practices by students include utilizing and maintaining waste bins for proper disposal of refuse, washing and cleaning the toilets, proper hand washing with soap and water after using the toilet room, and proper cleaning of the rooms, and surroundings. The measures to be taken by the school authorities like promoting good hygiene through extensive education, provision of sufficient toilets and latrine facilities, ensuring constant water supply in the hostel and provision of adequate well-functioning toilets and latrine systems, must be taken to enhance hostel sanitation.

Improved sanitation has significant impacts not only on health but on social and economic development particularly in developing countries.

Recommendations: Based on the findings of this study, the following recommendations were made:

1. wash-related materials and agents (i.e., supplying hand washing products, cleaning materials, washing equipment) should be regularly supplied to students living in the hostels to ensure quality cleaning services.
2. toilet cleaning checklist should be introduced to ensure quality cleaning services by cleaning professionals and low-cost menstrual hygiene-related disposal materials should be placed in existing buildings in female hostels.
3. the students should not depend on the cleaners of the hostel but should also participate in environmental sanitation in their hostels.

References

- Abanyie, S.K., Ebenezer, E.A., Nang, B.D., Michael, N.A., Benard, F.B., & Amodu, C.C (2022). *Environmental Challenge*, 26(8) <http://org/10.1016/j.enve.2022.100546>>gate right
- Arnett, J. J. (2000). Emerging adulthood. A theory of development from the late teens through the twenties. *The American psychologist*, 55(5), 469–480. <https://pubmed.ncbi.nlm.nih.gov/10842426/>
- Chard, A. N., Garn, J. V., Chang, H. H., Clasen, T., & Freeman, M. C. (2019). Impact of a school-based water, sanitation, and hygiene intervention on school absence, diarrhea, respiratory infection, and soil-transmitted helminths: Results from the WASH HELPSRluster-RandomizedTrial. *Journal of Global Health*, 9(2), 020402. <https://doi.org/10.7189/jogh.09.020402>
- Emerson, P. M., Lindsay, S. W., Alexan, Bah, M.,
- Dibba, S. M., Faal, H. B., Lowe, K. O., McAdam, K. P., Ratcliffe, A. A., Waslraven, G. E., & Bailey, R. L. (2004). Role of flies and provision of latrines in trachoma control. *Lancet*, 363(9415), 1093-1098. [https://doi.org/10.1016/s0140-6736\(04\)15891-1](https://doi.org/10.1016/s0140-6736(04)15891-1)
- Forever, V. (2022). *What is a hostel? An overview and tips for international travelers*. https://www.volunteerforever.com/article_post/what-is-a-hostel-an-overview-and-tips-for-international-traveler
- Groce, N., Bailey, N., Lang, R., Trani, J.-F., & Kett, M. (2011). Water and sanitation issues for persons with disabilities in low- and middle-income countries: a literature review and discussion of implications for global health and international development. *Journal of Water and Health*, 9, 617-627.
- <https://doi.org/10.2166/wh.2011.198>
- Nwobi, C.A. (2022) Hostel sanitation practices for improved health status. *Himalayan Journal of Applied Medical Sciences and Research*. <http://himjournals.com/article>.
- Hutton, G. (2017). How water scarcity causes poor sanitation. <https://www.unicef.org/wash/wa>
- Hyun, C., Burt, Z., Crider, Y., Nelson, K. L., Sharada Prasad, C. S., Rayasam, S. D. G., Tarpeh, W., & Ray, I. (2019). Sanitation for low-income regions: A cross-disciplinary review. *Annu Rev Environ Resour*, 44(1), 287-318. <https://doi.org/10.1146/annurev-environ-101718-033327>.
- Kabir, A., Roy, S., Begum, K., Kabir, A. H., & Miah, M. S. (2021). Factors Influencing Sanitation and Hygiene Practices among Students In A Public University In Bangladesh. *PLOS One*, 16(9), 0257663. <https://doi.org/10.1371/journal.pone.0257663>
- Kaminsky, J., & Jordan, E. (2017). Qualitative comparative analysis for WASH research and practice. *Journal of Water, Sanitation and Hygiene for Development*, 7(2), 196-208. <https://doi.org/10.2166/washdev.2017.240>
- Mara, D., Lane, J., Scott, B. & Trouba, D. (2010). Sanitation and health. *PLOS Medicine*. e1000363. <https://doi.org/10.1371/journal.pmed.1000363>
- Marshy, M . (1979) Social and psychological effects of overcrowding in Palestinian refugees in the West Bank and Gaza. Literature review and preliminary assessment of the problem. The International Development Research Centre from <http://www.ncbi.nlm.nih.gov>.
- McGranahan, G. (2015). Realizing the right to sanitation in deprived urban communities: meeting the challenges of collective action, coproduction, affordability, and housing tenure. *World Development*, 68, 242-253.

- <https://doi.org/https://doi.org/10.1016/j.worlddev.2014.12.008>.
- Mangrio, E., & Zdravkovic, S. (2018). Crowded living and its association with mental ill-health among recently-arrived migrants in Sweden: A quantitative study. *BMC Research Notes*, 11(1). <https://doi.org/10.1186/S13104-018-3718-6>
- Musa, R., & Haque, M. (2016). Assessment of factors contributing to poor environmental sanitation in the university's student male hostel. *International Journal of Pharmaceutical Research*, 8, 59-63.
- Musinguzi D. and Tumushabe A. (2018) *The Effect of Poor Sanitation on Public Health and Environment. A case. Ag>esa>sanit*
- Nelson, M. C., Story, M., Larson, N. I., Neumark-Sztainer, D., & Lytle, L. A. (2008). Emerging adulthood and college-aged youth: An overlooked age for weight-related behavior change. *Obesity*, 16(10), 2205-2211. <https://doi.org/10.1038/oby.2008.365>
- Nworgu, B., & Yager, R. (2006). The STS-constructivist reform: Some discordant notes. *African Journal of Educational Studies in Mathematics and Sciences*, 2. <https://doi.org/10.4314/ajesms.v2i1.38584>
- Ogbonna, D., Amangabara, G., & Ekere, T. O. (2007). Urban Solid Waste Generation in Port Harcourt Metropolis And its Implications For Waste Management. *Management of Environmental Quality: An International Journal*, 18, 71-88. <https://doi.org/10.1108/14777830710717730>
- Poague, K., Blanford, J. I., & Anthony, C. (2022). Water, sanitation and hygiene in schools in low- and middle-income countries: a systematic review and implications for the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 19(5). <https://doi.org/10.3390/ijerph19053124>
- Rajaratnam, G., Patel, M., Parry, J. V., Perry, K. R., & Palmer, S. R. (1992). An outbreak of hepatitis A: school toilets as a source of transmission. *Journal of Public Health Medicine*, 14(1), 72-82. <http://www.jstor.org/stable/45160192>
- Sangalang, S. O., Lemence, A. L. G., Ottong, Z. J., Valencia, J. C., Olaguera, M., Canja, R. J. F., Mariano, S. M. F., Prado, N. O., Ocaña, R. M. Z., Singson, P. A. A., Cumagun, M. L., Liao, J., Anglo, M. V. J. C., Borgemeister, C., & Kistemann, T. (2022). School water, sanitation, and hygiene (WaSH) intervention to improve malnutrition, dehydration, health literacy, and handwashing: a cluster-randomised controlled trial in Metro Manila, Philippines. *BMC Public Health*, 22(1), 2034. <https://doi.org/10.1186/s12889-022-14398-w>
- Snel, M., Bolt, E., & Postma, L. (2000). Challenges Facing school sanitation and hygiene education from the perspective of the school teacher. *Waterlines*, 19, 25-28. <https://doi.org/10.3362/0262-8104.2000.035>
- Taylor, K. M., Asako. (2020). *Improving Water, Sanitation, and Hygiene in Schools: A Guide for Practitioners and Policy Makers in Mongolia*. Asian Development Bank. <http://dx.doi.org/10.22617/TIM200125-2>
- Uchegbu, S. (2000). Environment Sanitation, and Health. *Environmental Review Journal*, 3, 206-214.
- Uddin, M. (2019). *Advantages and disadvantages of hostel life*. <https://medium.com/@merajpamir/advantages-and-disadvantages-of-hostel-life-9541f635b551>
- Uganda, W.A. (2022 June 23). *Status of water sanitation and hygiene in primary schools*. <https://www.wateraid.org/ug>.
- Webster, M. (2022, March, 20). *The words of the week - 3/20/20*. <https://www.merriam-webster.com/words-at-play/the-words-of-the-week>. WHO. (2020).