Original article

Coping with sanitary hazards in hostels: The influence of student's socioeconomic variability

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ABSTRACT

Managing environmental hazards in any environment is imperative as they are harmful phenomena, objects, behaviours, conditions or human activities which may result in loss of life, injury and other health impacts. Therefore, this article assessed how students' socioeconomic attributes affect their ability to cope with issues of sanitary hazards in tertiary public education institutions in Oyo State, Nigeria. The study evaluated such relationships using a perceptual approach whereby socioeconomic characteristics of students and their responses to sanitary hazards were captured. Data were obtained through a questionnaire survey which was administered to each of the selected 367 students residing on campus in three tertiary institutions using probability sampling procedures. Data obtained were analysed using frequency distribution and Analysis of Variance (ANOVA). Findings revealed that students' coping ability had significant variation with socioeconomic variability such as age of student ($F_{(3,363)} = 4.090, p = 0.007^*$), ethnicity ($F_{(3,363)} = 3.381, p = 0.018^*$) and childhood environment ($F_{(2,364)} = 7.207, p = 0.010^*$). Of which the effect size measures of these attributes as presented by the Eta-squared statistic indicated that each attribute of these socioeconomic variability [age (0.033), ethnicity (0.027) and childhood environment (0.038)] accounted for a medium magnitude of students' coping ability. The study, however, concludes that students are in need of environmental sanitation education to provide the required health knowledge and safety precautions to ensure sanitary environments within the institutions.

KEY WORDS: sanitary hazards, sanitary behaviour, socioeconomic variables, coping ability, environmental health

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1. Introduction

Managing environmental hazards and risks in any environment is imperative. The reason being that human activities have consequentially reduced the environment's capacity to meet its social and ecological needs, thereby contributing to an increase in vulnerability of man to environmental hazards (AL-AMIN, 2013). According to UNITED NATIONS INTERNATIONAL STRATEGY FOR DISASTER REDUCTION [UNISDR], (2009), an environmental hazard is any harmful phenomenon, element, behaviour, condition or human activity which may result in loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic

disruption, or environmental damage. Environmental risk, on the other hand, is the likelihood of harmful consequences, or expected losses, which are caused by interactions between natural or human-induced hazards and vulnerable situations (UNISDR, 2004; GENCER, 2013).

There has been increasing concerns and efforts by environmentalists regarding the elimination and/or mitigation of the effects of environmental hazards (BIRKMANN, 2007; OLOGUNORISA, 2009; ADEDEJI ET AL., 2012; MACKINNON & DERICKSON, 2013). This can be achieved by way of creating a livable environment, the reason being human development and health are related to the quality of the immediate environment (OKAREH, 2015); as man

is physically, physiologically and psychologically attached to his living environment. This encompasses those elements of home and neighbourhood that contribute to safety, economic opportunities and welfare, health and convenience. Aside from the living environment, workplaces such as business organisations and educational institutions are likewise expected to be safe and secure. This is because no developmental processes and benefits could be generated when humans are in the state of ill-health (ROTIMI, 2012).

The living and/or working environments in many developing countries are not devoid of manmade environmental hazards including sources of pollution such as industrial emissions, poor sanitation, inadequate waste management, contaminated water supplies, poor housing and exposure to indoor air pollution (NSIAH & GYABAAH, 2010). As for the indoor environment, risks attached to poor housing and unsanitary conditions are health-related problems classified as Sick Building Syndrome (SBS), building-related disease and building-associated symptoms associated with living conditions in residential buildings and working conditions in offices and commercial buildings (JOSHI, 2008; ROY, 2010). SBSs, for instance, are usually without specific illnesses and causes but are linked with time spent in the building (JOSHI, 2008). On the other hand, the causes ascribed by common theories are type of building material, poor sanitation, office equipment and furnishings, air condition of the building, poor indoor air quality and environmental factors including building temperature, odours, noise and humidity (JANSZ, 2011). For the outdoor environment, contaminated water sources and poor municipal waste management have high health impacts for residents (ABILA & KANTOLA, 2013; OJEWALE, 2014; OKEREKE ET AL., 2016). Meanwhile, industrial pollution could have adverse health effects on people as workers and residents (OKEREKE ET AL., 2016; OLAJUMOKE & OLUWAGBEMIGA, 2017).

The same hazard conditions are evident in some educational institutions across the globe. According to SLIVKA (2000), educational institutions are confronted with environmental hazards that have emanated from various sources such as hazardous waste storage and disposal practices in the cases of Yale University in 1999 and Stanford University in 1994. Other sources of hazards include emission from industries placed on campuses, use and condition of infrastructure available for teaching and learning, and poor environmental conditions in hostels and academic areas (GOBINATH ET AL., 2010; MERSHALL, 2012). In developing countries

like Nigeria, environmental hazards in educational institutions are lumped under environmental pollution with evidence of risks which are communicated through air, water, food and sound (MODEBELU & AGOMMOUCH, 2014); these have been perceived as hazards emanating from living conditions and human behaviour which are a dimension of manmade environmental/sanitary hazards and risk assessment (SADALLA ET AL., 1999; MOYSES ET AL., 2006 cited in AFON, 2011). Students and the campus community at large are exposed to detrimental health risks through these media as pollution has no boundary. Apparently, most institutions have not been able to eliminate sanitary hazards. It is therefore pertinent to assess how people are coping with these hazards.

Coping is conceptualised as the conscious efforts expended towards solving personal or interpersonal conflicts in order to develop responses that would minimise harm and/or adapt to such circumstances (SNYDER, 1999; WEITEN & LLOYD, 2009). In the context of this study, it is therefore conceptualised as the conscious efforts expended towards resolving conflicts in regard to issues of sanitary hazards. In other words, this entails evaluating how students would respond to situations, or conditions, that could harm them and how they manage the associated sanitary risks. With a focus on tertiary public education institutions, this article assessed students' coping ability with regard to various sanitary threats that students are exposed to. This involved an assessment of how the different socioeconomic attributes of students, among others, had affected their perceptions of sanitary hazards thereby influencing their coping abilities.

2. Literature review

2.1. Socioeconomic variability and environmental perception

Environmental perception study is used in this article when determining students' coping abilities. This is because environmental perception is concerned with an understanding of environmental components and events by using human senses through the process of awareness of, or having feelings about, the environment (ZUBE, 1999). It is also viewed as the way individuals evaluate and store information received about the environment (TUAN, 1974; HOBBS & SALTER, 2006). Perception usually depends on many factors, one of which is the perceiver's traits, as perception varies widely among individuals exposed to the same reality (RAO, 2008). More so, the same evaluation of the

same object, or environment, could not be made precisely by two observers considering conditions at the time of observation (AFON, 1998).

The perceiver's traits have been considered in many studies and in principle, have been encapsulated in socioeconomic variability of individuals. These studies include socioeconomic attributes and status (GOODCHILD, 1974; CARTER, 1975; CHEN ET AL., 2012), cultural attributes (TRIANDIS, 1989; HOFSTEDE, 1991; KASTANAKIS & VOYER, 2014), religion (BURNS & GROOMS, 2002; DIDONATO, 2012; HOPE & JONES, 2014), experience (LYNCH, 1977; PORTEOUS, 1976; CHEN ET AL., 2012), quantity and quality of information made available (GOLLEDGE, 1978) and the form of the environment itself (CARR & SCHISSLAR, 1969; MCGUIRE ET AL., 1994; AKINDELE, 2011; CHEN ET AL., 2012). In the study of CHEN ET AL. (2012), it was observed that socioeconomic factors influenced environmental attitudes which were evaluated through perception. Environmental attitude was found to be positively related to people's educational status, income, employment status and employment rank, and was negatively related to their age and female gender. Moreover, socioeconomic attributes, especially income and education status, determine a person's social status which likewise affects their perception. The perception of people in the low income class about issues is thus expected to be different from those of other income classes. People of low social status are usually in the low income class who live below the daily poverty line. The global poverty line was earlier put at US\$1 for the years before 2005, while in 2005 it was US\$1.90 which was later updated to US\$1.25 (SACHS, 2005; WORLD BANK, 2005; RAVALLION ET AL., 2009; WORLD BANK, 2015).

With respect to experience, CHEN ET AL. (2012) also established that people who had experienced environmental harm had more pro-environmental attitudes than those who had not experienced environmental harm. In the work of MARKUS & KITAYAMA (1991) and KASTANAKIS & VOYER (2014), it was also stated that culture shapes the way people perceive themselves and others, and the relationship existing between them and others (MARKUS & KITAYAMA, 1991; KASTANAKIS & VOYER, 2014). Cultural differences often lead to notorious misunderstandings as some cultures perceive certain simple gestures as positive, while others view them as negative (KASTANAKIS & VOYER, 2014). With respect to religion, DIDONATO (2012) expressed that theology shapes not only peoples' ability to reason but their perception of any issues. Most religions have different values and doctrines which

have been taught over time and have influenced the belief systems of the religious practitioners.

The influence of the form of the environment itself on perception relates to given consideration to the physical or built environment (AKINDELE, 2011); as it has influence on an individual's upbringing and other aspects of developmental processes (SPEARS & LAMBA, 2011). For instance, the urban environment differs from the rural environment with respect to living conditions, form of housing, availability and condition of infrastructure among others (AGBOLA, 2006; STANSELL & MCLAUGHLIN, 2013; COFFEY ET AL., 2015). Each environment equally has its own advantages and disadvantages. The rural environment is characterised by its small population, agrarianism, simple forms, traditional housing and limited basic infrastructure which are usually obsolete and in poor conditions (ABEGUNDE, 2011; RAH ET AL., 2015). The urban environment is recognized by its high population, industrialisation, modern housing and infrastructure, although some parts of it are characterised by slums and shanties (ADEJUGBE, 2004; AGBOLA, 2006; OMOFUNRUWAN & OSA-EDOR, 2008). Individuals that were brought up in a rural environment are thus expected to have different living experiences and exposure from their counterparts in an urban environment.

3. Materials and methods

Data for the study were collected from three tertiary educational institutions located in Oyo state. Oyo State is one of the six states in the south-western geopolitical zone of Nigeria. The selected public tertiary institutions are University of Ibadan, Ibadan (UI); The Polytechnic, Ibadan (PolyIbadan); and Federal College of Education, Oyo town (FCE). The focus of the study was the student residential areas of these selected institutions. Primary data were chiefly used for the study. A systematic random sampling technique was used to collect data through administration of a questionnaire on students residing on-campus in halls of residence provided by these institutions. Both the male and female halls were taken into consideration. Using simple random sampling, four halls (two males and two females) were selected in UI, two halls (one male and one female) in PolyIbadan while the two halls (one male and one female) in FCE were considered. The four selected halls in UI have 973 rooms, the two selected halls in PolyIbadan have 501 rooms and there are 69 rooms in the two halls in FCE. In each institution, one student was sampled in every 5th room in the selected halls of residence. This resulted in

sampling 197, 101 and 69 students in UI, PolyIbadan and FCE respectively, thus a total of 367 students were sampled.

Information obtained through the use of the questionnaire included socioeconomic attributes and coping-response of the students on the four levels of data measurement comprising nominal, ordinal, interval and ratio. When measuring students' level of coping with sanitary hazards across the three institutions, the respondents were requested to rate some man-made hazards attributes on a three-point Likert scale of 1= low, 2 = moderate and 3= High. Analysis of the data was carried out using both descriptive and inferential statistics. Descriptive analysis was by means of cross-tabulation that presented both frequency and percentage distributions of the data across the tertiary institutions. Inferential statistics such as Analysis of Variance (ANOVA) and Eta-squared (η^2) were used for further analysis. The ANOVA test satisfied the parametric test assumption whereby the data contained by the dependent variables exist on either interval or ratio level of measurement. In other words, it justified the use of continuous data. On the other hand, the independent variables contained data on a nominal level of measurement, say, categorical data. The test was therefore appropriate in establishing if a significant relationship existed between the data that were examined.

By application, the relationship between students' socioeconomic variability and their coping ability with sanitary hazards was established using ANOVA. As earlier established, the coping ability was determined from the rated scaled attributes of man-made hazards. The designated values of 1, 2 and 3 were used to allot weights to the options chosen by respondents for each attribute. A Weighted Value (WV) for each respondent was determined by a linear combination of the attributes measured. Thereafter, a mean index was formed and named the Sanitary Hazard Coping Ability Index (SHCAI). The SHCAI thus constituted the dependent variable for the ANOVA analysis. Socioeconomic variables, including gender, age group, religion, ethnicity and childhood environment, were subsequently tested against the SHCAI. By this, the difference between coping ability of students was tested for significance using each of the socioeconomic variables as a factor. In essence, a relationship between the dependent variable (coping ability) and independent variable (socioeconomic ability) was determined.

Regarding establishing the strength of association which indicates the effect size, Eta squared was used. Eta Squared as an effect size measure needs

to be used with caution for reasons of its confusion and misinterpretation with partial Eta Squared in the literature (LEVINE & HULLETT, 2002; RICHARDSON, 2011). Apparently, certain versions (e.g. versions 9 and 10) of Statistical Package for Social Sciences (SPSS), produced partial Eta squared results in SPSS outputs which most users confused for Eta squared (LEVINE & HULLETT, 2002; PIERCE ET AL., 2004). There has been an improvement on later versions where Eta squared is actually produced (e.g. version 18 and above) (<https://en.m.wikiversity.org/wiki/Eta-squared>). The application used for this analysis was SPSS Version 20. Aside, the results of partial Eta squared and Eta squared are believed to be quite equivalent in one factor ANOVA design, that is, when a predictor variable is involved in the comparison of group means. With respect to the interpretation of Eta squared in this article, it adheres to the COHEN (1988) benchmarks of small ($\eta^2 = 0.0099$), medium ($\eta^2 = 0.0588$) and large ($\eta^2 = 0.1379$) effect sizes.

In the conduct of the ANOVA and Eta Squared being the inferential statistics, the null hypotheses (H_0) and alternative hypotheses (H_1) to test the difference between students' socioeconomic variability and their coping ability with sanitary hazards were formulated. The socioeconomic variability includes gender, age, income, ethnicity, religion, childhood, type of building lived during childhood and type of building lived at home currently. The coping ability with sanitary hazards comprises Blight of and stench from unkempt toilet and bathroom, Infections from unkempt toilet and bathroom, Stenches from filthy open drains, Infections of mosquitoes from stagnant water, Stenches from open dump sites, Infections from direct contact with open site dumps, Infections from disease vectors from open site dumps and Infection of disease vectors from bushy environment. Others include harms caused by bushy areas/ overgrown lawns, Air pollution from burning of solid waste, Stench from septic tanks/ man holes, Infections from diseased vectors from septic tanks/manholes etc., Stenches from undisposed waste bin, cans, etc., Infections from diseased vectors from undisposed waste bins, cans, etc., Smoke from indoor cooking as well as Air quality reduction due to overcrowding and ill-ventilation.

The test-statistic followed the F-Distribution and the level of significance was 0.05, an indication that only a 5% error was permitted. Acceptance of H_0 was therefore ascertained provided the p-value was greater than 0.05, otherwise, it was rejected. This led to the acceptance of the alternative hypotheses.

Research hypotheses

1. H_0 : There is no significant difference between student gender and their ability to cope with sanitary hazards in hostels.
2. H_0 : There is no significant difference between student age and their ability to cope with sanitary hazards in hostels.
3. H_0 : There is no significant difference between student income and their coping ability with sanitary hazards in hostels.
4. H_0 : There is no significant difference between student ethnicity and their coping ability with sanitary hazards in hostels.
5. H_0 : There is no significant difference between student religion and their coping ability with sanitary hazards in hostels.
6. H_0 : There is no significant difference between student childhood environment and their coping ability with sanitary hazards in hostels.
7. H_0 : There is no significant difference between student type of childhood building and their coping ability with sanitary hazards in hostels.
8. H_0 : There is no significant difference between student type of current home building and their coping ability with sanitary hazards in hostels.

4. Results and discussions

4.1. Socioeconomic background of students

The socioeconomic variability used in this study comprised gender, age, income, academic level, childhood and current home environment of the students. The gender distribution of students in the three selected institutions is shown in Table 1. In UI, there were more female respondents (54.8%) than male respondents (45.2%). This was also the case in PolyIbadan, as female respondents comprised 61.4% of the respondents while male respondents constituted 38.6%. However, the male respondents (52.2%) were more than female respondents (47.8%) in FCE. In all the institutions, the proportion of female respondents (55.3%) was higher than the male respondents (44.7%). Nevertheless, there was a proportional representation of the two genders in all the institutions.

With regards to age distribution of students in the institutions, the data on age were obtained as quantitative data. The minimum and maximum ages for the respondents in the three institutions were 16 and 37 years respectively. This age range to a certain extent aligned with the '18-35 years' age group that was defined by [OKEBUKOLA \(2008\)](#)

as the higher education participation rate. For ease of presentation, the quantitative data were transformed into categorical data of four categories to reflect the following age groups: less than 20 years, 20-24 years, 25-29 years and 30 years and above. The results across the institutions are shown in Table 2.

In UI, most of the respondents (41.1%) were less than 20 years of age. This was followed by the '20-24 years' age group that constituted 36.5% and the '25-29 years' age group that constituted 15.7%. The age group with the lowest proportion (6.6%) was the '30 years & above'. In PolyIbadan, the '20-24 years' age group had the highest proportion (31.7%), followed by the 'less than 20 years' group which constituted 31.7%. The subsequent age group on the rank was '25-29 years' which constituted 15.8% while the '30 years & above' age group constituted the lowest proportion (5.9%). In FCE, the age group with the highest proportion (44.9%) was the '20-24 years' while those less than 20 years (27.5%) ranked next. This was followed by the '25-29 years' age group which constituted 23.2% of the respondents. Respondents comprising the age group '30 years and above' constituted the lowest proportion which was 4.3%. It could be inferred that students which constituted the highest proportion of respondents in UI were younger compared with those that constituted the highest proportion in PolyIbadan and FCE. This may imply that more youngsters were admitted into this university compared with polytechnic and college of education due to a delay in securing admission to the former that then made some people opt for the latter. However, by aggregating the age distributions of all three institutions, students within the age group of '20-24 years' constituted the highest respondents (40.9%), and this was followed by those in the 'less than 20 years of age' group (36.0%). The age group '25-29 years' ranked next (17.2%), and this was followed by students of '30 years and above' which constituted the lowest proportion (4.3%), thus indicating that they were not many older students among the undergraduate student population. The results of the age distribution were as expected because students between the ages of 16-24 years who were younger students constituted the majority of undergraduate scholars. This may be due to early education at this contemporary time that could influence timely enrolment into tertiary educational institutions in the country ([UNITED STATES EMBASSY IN NIGERIA, 2012](#)).

Table 1. Gender of students (source: Authors' fieldwork data analysis, 2016)

Educational institutions	Gender		Total
	Male	Female	
UI	89(45.2)	108(54.8)	197(100)
Poly Ibadan	39(38.6)	62(61.4)	101(100)
FCE	36(52.2)	33(47.8)	69(100)
Total	164(44.7)	203(55.3)	367(100)

Table 2. Age groups of students (source: Authors' fieldwork data analysis, 2016)

Educational institutions	Age				Total
	Less than 20	20-24	25-29	30 & above	
UI	81(41.1)	72 (36.5)	31(15.7)	13(6.6)	197(100)
Poly Ibadan	32(31.7)	47(46.5)	16(15.8)	6(5.9)	101(100)
FCE	19(27.5)	31(44.9)	16(23.2)	3(4.3)	69(100)
Total	132(36.0)	150(40.9)	63(17.2)	22(6.0)	367(100)

The essence of ethnicity in this study was to examine the influence that cultural norms and folkways have on issues of sanitary hazards in respect of the living conditions of students, such as use of environmental amenities and disposition to environmental sanitation. This ethnicity attribute was considered in line with the assertion of [MARKUS & KITAYAMA](#) (1991) as well as [KASTANAKIS & VOYER](#) (2014) that culture could shape people's perception about any issue; while misunderstanding of certain simple gestures could be insinuated as positive or negative based on cultural differences. As Nigeria is a multi-ethnicity country with varying cultures and customs, such attributes could not but be considered. The distribution of ethnicity of students is shown in Table 3. The three major tribes in Nigeria which are Yoruba, Hausa and Igbo were computed as three different categories with the minor tribes computed as one category (Others). The respondents in UI, PolyIbadan and FCE were mostly Yoruba tribe with 71.1%, 83.2% and 69.9% respectively for the institutions. For all the institutions, about two-thirds of respondents were from Yoruba tribe (73.8%). The reason could be due to the fact that the selected institutions are located on Yoruba land. The Igbo tribe constituted 13.1% of student respondents, followed by the minor tribes which constituted 8.2% of respondents. The Hausa tribe constituted a low proportion of respondents (4.9%).

Religious belief is another factor that could influence individuals' perception of sanitary hazards. This is because theology could shape not only reasoning about issues but perception of such issues itself ([DIDONATO](#), 2012). Belief in any of the world religions has therefore impacted individuals'

perception of environmental issues and proposed solutions ([HOPE & JONES](#), 2014). Students are not exempted from religious practices, as many of them have been brought up in one religion or the other. Table 4 shows the religious distribution of students in the institutions. Two religions (Christianity and Islam) were basically practised by the students. In UI, the proportion of Christian respondents (89.8%) was a lot higher than that of Islamic students (10.2%). In PolyIbadan, the proportion of Christian respondents (71.3%) was also higher than that of Islamic students (28.7%). In FCE, however, there was little relative difference in the number of Christian respondents (52.2%) and Islamic respondents (47.8%). Across the institutions, the proportion of Christian respondents (77.7%) was higher than that of Islamic respondents (22.3%).

Presented in Table 5 is the distribution of the monthly income of students across the three institutions. Data on student allowances were collected as quantitative data. The quantitative data were later grouped for easy of presentation. The six resultant groups were 'less than ₦10000, ₦10000 - ₦19999, ₦20000 - ₦29999, ₦30000 - ₦39999, ₦40000 - ₦49999 and ₦50000 & above'. The majority of the students in all three institutions received less than ₦10000 as a monthly allowance (58.4%, 96.0% and 94.2% respectively). Few proportions of the students (7.1% and 1.4% respectively) received '₦50000 and above' in UI and FCE while none received such amounts in PolyIbadan. Generally, it can be deduced that the student monthly allowances are products of their parents' incomes. Based on findings on parent's income, it could be ascertained that the respondents' monthly allowances were likely to be affected.

This assumption was ascertained by the findings that the majority of the students were receiving less than ₦10000 as a monthly allowance. There is therefore an indication that most respondents were living below the poverty level. An average respondent was living on ₦300 per day, approximately 1 dollar (US\$1) based on the same foreign exchange rate for Nigeria at the time of this research. This finding confirms the report by

DAWODU (2000) that there was serious poverty among Nigerian students. This is because any person living on less than US\$1.25 per day is globally recognized as living in poverty (WORLD BANK, 2015). The state of poverty likewise determines an individual's social status and living standards which are factors that could affect the students' perception of sanitary hazards.

Table 3. Ethnic groups of students (source: Authors' fieldwork data analysis, 2016)

Educational institutions	Ethnicity				Total
	Yoruba	Hausa	Igbo	Others	
UI	140(71.1)	0(0.0)	31(15.7)	26(13.2)	197(100)
Poly Ibadan	83(82.2)	5(5.0)	11(10.9)	2(2.0)	101(100)
FCE	48(69.6)	13(18.8)	6(8.7)	2(2.9)	69(100)
Total	271(73.8)	18(4.9)	48(13.1)	30(8.2)	367(100)

Table 4. Religion of students (source: Authors' fieldwork data analysis, 2016)

Educational institutions	Religion of students		Total
	Christianity	Islam	
UI	177(89.8)	20(10.2)	197(100)
Poly Ibadan	72(71.3)	29(28.7)	101(100)
FCE	36(52.2)	33(47.8)	69(100)
Total	285(77.7)	82(22.3)	367(100)

Table 5. Monthly income of students (source: Authors' fieldwork data analysis, 2016)

Educational institutions	Monthly income						Total
	<10000	10000-19999	20000-29999	30000-39999	40000-49999	50000 & above	
UI	115(58.4)	8 (4.1)	21(10.7)	23(11.7)	16(8.1)	14(7.1)	197(100)
Poly Ibadan	97(96.0)	4(4.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	101(100)
FCE	65(94.2)	2(2.9)	1(1.4)	0(0.0)	0(0.0)	1(1.4)	69(100)
Total	277(75.5)	14(3.8)	22(6.0)	23(6.3)	16(4.4)	15(4.1)	367(100)

Based on the views of AKINDELE (2011) and SPEARS & LAMBA (2011) that the form of the environment influences an individual's behaviour and perception of the same, the childhood environment of students was included in the socioeconomic background variables. This is because this environment has to do with where they were brought up, especially where they lived in their early childhood days (1-12 years). Obtaining this kind of information could better provide this study with the students' disposition to issues of sanitary hazards. As shown in Table 6, in UI, 70.6% of the respondents lived in rural areas between the ages of 1-12 years and a low proportion of them (29.4%) lived in urban areas. In PolyIbadan, 75.2% of respondents lived in rural areas while

24.8% lived in urban areas. In FCE, 79.7% of the respondents lived in a suburban area, 20.3% lived in rural areas. In general, 73.2% of students lived in rural areas and 26.8% in urban areas. Thus the majority of respondents were raised in rural areas. Meanwhile, these areas are mostly characterised by a low quality of life for inhabitants as well as poor housing, environmental amenities and sanitation behaviour (STANSELL & McLAUGHLIN, 2013; RAH ET AL., 2015; COFFEY ET AL., 2015). Children brought up in a rural environment are therefore believed to have a negative disposition towards urban living conditions such as their use of environmental amenities and sanitation due to their exposure (SPEARS & LAMBA, 2011).

To further verify this fact, data on types of house lived in by students before 12 years of age were analysed and presented (Table 7). It was found that a simple majority of respondents in UI, PolyIbadan and FCE which accounted for 43.7%, 42.5% and 46.4% of respondents respectively, lived in compound houses. More so, 35.5%, 34.7% and 43.5% of respondents in the respective institutions lived in Brazilian houses. The least proportion of these respondents which accounted for 20.8%, 22.8% and 10.1% of respondents in the same order of the institutions lived in flats. In total, 43.9% of students in the institutions lived in compound houses, 36.8% of students lived in Brazilian houses and 19.3% of students lived in flats. This indicates that 80.7% of respondents during their childhood days lived in compound and Brazilian houses which are usually attributed with poor housing condition in terms of materials, designs and construction (OGUNDAHUNSI & ADEJUWON, 2014).

Furthermore, data on facilities available in the houses lived in by students before the age of 12 years was analysed across the institutions and presented in Table 7. In UI, 43.6% of respondents indicated that they had pit latrines, 13.4% had water closets; 34.9% had exterior bathrooms and 8.1% had indoor bathrooms in their homes. In PolyIbadan, 49.1% had pit latrines, 13.3% of the respondents

had water closets, 30.7% had exterior bathrooms and 6.9% had indoor bathrooms in their homes. In FCE, 71.2% of respondents indicated that they had pit latrines, 13.0% had water closets, 34.4% had exterior bathrooms and 11.4% had indoor bathrooms. Generally, in the institutions, 44.7% of respondents made use of pit latrines, 13.3% of water closets, 33.5% made use of exterior bathrooms and 8.5% made use of interior bathrooms during their childhood. The majority of these respondents were therefore familiar with the use of pit latrines and exterior bathrooms. These kinds of facilities are mostly available in compound and Brazilian houses in Nigeria. Based on the findings about the childhood environment of students, it could be inferred that two thirds of the respondents were raised in rural areas, more than two thirds of respondents lived in compound and Brazilian houses, while the majority of them were brought up to use pit latrines and exterior bathrooms during their childhood days. Since these students had been exposed to such situations during childhood, their presence in any educational institutions they attend could constitute more of an sanitary hazard. This is because exposure to such an environment among other factors has been found to affect children's developmental processes thus having long-lasting effects on their behaviour and health (SPEARS & LAMBA, 2011).

Table 6. Childhood environment of students (source: Authors' fieldwork data analysis, 2016)

Educational institutions	Childhood environment		Total
	Rural	Urban	
UI	139(70.6)	58(29.4)	197(100)
Poly Ibadan	76(75.2)	25(24.8)	101(100)
FCE	55(79.7)	14(20.3)	69(100)
Total	270(73.2)	97(26.8)	367(100)

Table 7. Type of house lived in before 12 years of age (source: Authors' fieldwork data analysis, 2016)

Educational institutions	Type of house lived before 12 years of age			Total
	Compound	Brazilian	Flat	
UI	86(43.7)	70 (35.5)	41(20.8)	197(100)
Poly Ibadan	43(42.6)	35(34.7)	23(22.8)	101(100)
FCE	32(46.4)	30(43.5)	7(10.1)	69(100)
Total	161(43.9)	135(36.8)	71(19.3)	367(100)

Data on type of houses currently lived in by students while they were out of their educational institutions were analysed in order to assess their present living conditions at their respective homes. This was done to examine if there would be a change in students' perception of sanitary hazards as a result of a change from childhood

environment or not. Table 8 presents the distribution of the type of housing they occupied at the time of the survey. In UI, it was revealed that the highest proportion of respondents (66.5%) lived in flats, followed by 13.7% of respondents who lived in Brazilian houses. The lowest proportion of these students (20.8%) lived in compound houses. In Poly

Ibadan, the highest proportion of respondents (39.6%) lived in flats, followed by 35.6% of respondents who lived in Brazilian houses. The lowest proportion of these respondents (24.8%) likewise lived in compound houses. In FCE, the highest proportion of respondents (40.6%) lived in Brazilian houses, followed by 31.9% of students who lived in compound houses. The lowest proportion of these respondents (10.1%) lived in Brazilian houses. The current housing situation as indicated by the respondents revealed that the majority of respondents in UI and PolyIbadan lived in flats compared with FCE where the majority of respondents lived in Brazilian houses. In all the institutions, it was revealed that 54.5% of respondents lived in flats, 25.6 % lived in Brazilian houses and 20.3% lived in compound houses. There is therefore an indication that the housing status of most of the respondents has changed compared with when they were children within the ages of 1-12 years. It is thus pertinent to examine if there were also changes in the facilities available in the present state of housing.

4.2. Students' responses to coping with sanitary hazards

Sanitary hazards in student hostels involved examining attributes that pose threats to the lives of students while living within the confinement of their hostel environment. This had to do with availability, and conditions of, environmental amenities with respect to use and disuse of these amenities and surrounding environments, as provided in the works of AFON (2011), MBAMALI ET AL., (2012) and DARAMOLA (2015). Physical observations showed that there was an availability of amenities including toilet, bathroom, water supply, electricity, drainage, waste collection services; implying that the management of these institutions has provided a means of ensuring basic sanitation and health hygiene among students. However, an assessment of the condition of most amenities showed otherwise. It was revealed that sanitary hazards associated with toilets and bathrooms, among others, in these institutions were not in terms of quantity but of quality which has been degraded by poor maintenance. A good instance is the bad condition of toilet and bath facilities to the extent that most respondents could not make use of these facilities. Regarding the toilets and bathrooms and smells that emanated from them, 87.3%, 54.5% and 58.0% of respondents in UI, PolyIbadan and FCE respectively had low coping ability (Table 9). In a way to adjust for their

needs, these respondents made use of unhygienic alternative means for disposing of their faecal waste including defecating in open spaces, bushes and drains. They likewise defecated in polythene bags which were thrown or dropped around the hostels. These are potential sanitary hazards that could result in health risks such as outbreak of diseases such as cholera (Table 9).

Another challenge faced by students was the ability to cope with smells emanating from defective waste facilities. Results showed that 74.7%, 59.4% and 55.1% of respondents in UI, PolyIbadan and FCE respectively had low coping abilities with smells emanating from damaged septic tanks and sewers as well as uncovered manholes. Likewise, 77.7%, 61.4% and 65.2% of respondents in UI, PolyIbadan and FCE respectively could barely cope with smells emanating from filthy open drains, while 73.1%, 62.4% and 66.7% in UI, PolyIbadan and FCE respectively could barely cope with the smells from open dumpsites. This is therefore a high level of intolerance for this kind of sanitary hazard as shown by the statistics provided. In relation to presence of disease vectors and related infections, the coping ability of students was also analysed. Disease vectors such as mosquitoes, flies, cockroaches and rodents emanating from sources such as stagnant water, open dumpsites, undisposed waste bins and bushy environments were barely coped with by most students. Results indicated that 80.7.1%, 67.3% and 65.2% of respondents respectively in UI, PolyIbadan and FCE had low coping ability with infections caused by mosquitoes due to the presence of stagnant water, among others (Table 9).

Air pollution, both indoor and outdoor, was another challenge faced by students. The indoor pollution was an aftermath of the type of energy used in cooking, overcrowding and poor ventilation, while outdoor pollution was caused by burning of solid waste. The major of respondents (73.6%, 63.3% and 75.4% in UI, PolyIbadan and FCE respectively) stated that they had a low coping ability with smoke resulting from cooking in their rooms. This was likewise the case for reduction in air quality caused by overcrowding and poor ventilation. The majority of respondents in UI, PolyIbadan and FCE had a low coping ability with 78.2%, 56.4% and 55.1% accounting for these proportions of respondents in the institutions respectively. The outdoor pollution caused by burning of solid waste also resulted in the majority of the respondents having a low coping ability with 89.3%, 60.4% and 63.8% of them were accounted for in UI, PolyIbadan and FCE respectively.

Table 8. Type of house currently lived in (source: Authors' fieldwork data analysis, 2016)

Educational institutions	Type of House Lived in Currently			Total
	Compound	Brazilian	Flat	
UI	27(13.7)	39 (19.8)	131(66.5)	197(100)
Poly Ibadan	25(24.8)	36(35.6)	40(39.6)	101(100)
FCE	22(31.9)	19(27.5)	28(40.6)	69(100)
Total	74(20.2)	94(25.6)	199(54.2)	367(100)

Table 9. Level of students' coping ability with sanitary hazards in hostels (source: Authors' fieldwork data analysis, 2016)

MEHR	Level of coping								
	UI			PolyIbadan			FCE		
	High	Medium	Low	High	Medium	Low	High	Medium	Low
A	172(87.3)	10 (5.1)	15(7.6)	55(54.5)	13 (12.9)	33(32.6)	40(58.0)	12 (17.4)	17(24.6)
B	183(92.9)	8 (4.1)	6(3.0)	61(60.4)	3 (3.0)	37(36.7)	49(71.0)	5 (7.2)	15(21.7)
C	153(77.7)	27 (13.7)	17(8.6)	62(61.4)	6 (5.9)	33(32.6)	45(65.2)	4 (5.8)	20(29.0)
D	159(80.7)	13 (6.6)	25(12.7)	68(67.3)	4 (4.0)	29(28.7)	45(65.2)	0 (0.0)	24(34.8)
E	144(73.1)	35 (17.8)	18(9.1)	63(62.4)	8 (7.9)	30(29.7)	46(66.7)	14 (20.3)	9(13.0)
F	128(65.0)	29 (14.7)	40(20.3)	56(55.5)	11 (10.9)	34(33.7)	51(73.9)	6 (8.7)	12(17.4)
G	160(81.2)	19 (9.6)	18(9.1)	64(63.4)	6 (5.9)	31(30.7)	37(53.6)	4 (5.8)	28(40.6)
H	159(80.8)	20 (10.2)	18(9.1)	57(56.5)	6 (5.9)	38(37.7)	40(57.8)	19 (27.5)	21(30.4)
I	127(64.5)	30 (15.2)	40(20.3)	66(65.4)	0 (0.0)	35(34.6)	52(75.4)	5 (7.2)	12(17.4)
J	176 (89.3)	3 (1.5)	18(9.1)	61(60.4)	9 (8.9)	31(30.7)	44(63.8)	6 (8.7)	19(27.5)
K	147(74.7)	32 (16.2)	18(9.1)	60(59.4)	5 (5.0)	36(35.6)	38(55.1)	10 (14.5)	21(26.1)
L	156(79.2)	23 (11.7)	18(9.1)	61(60.4)	2 (2.0)	38(37.6)	42(60.9)	7 (10.1)	20(29.0)
M	174(88.3)	5 (2.5)	18(9.1)	62(61.4)	10 (9.9)	29(28.8)	44(63.8)	7 (10.1)	18(26.1)
N	168(85.3)	3 (1.5)	26(13.2)	62 (61.4)	6 (5.9)	3 (32.6)	54(78.3)	4 (5.8)	11(15.9)
O	145(73.6)	22 (11.2)	30(15.2)	64 (63.3)	6 (5.9)	31(30.7)	52(75.4)	3 (4.3)	14(20.3)
P	154(78.2)	3 (1.5)	40(20.4)	57 (56.4)	4 (4.0)	40(39.7)	38(55.1)	4 (5.8)	27(39.1)

Please Note: A= Blight of and stench from unkempt toilet and bathroom, B= Infections from unkempt toilet and bathroom, C= Stenches from filthy open drains, D= Infections of mosquitoes from stagnant water, E= Stenches from open dump sites, F= Infections from direct contact with open site dumps, G= Infections from disease vectors from open site dumps, H= Infection of disease vectors from bushy environment, I= Harms caused by bushy areas/ overgrown lawns, J= Air pollution from burning of solid waste, K= Stench from septic tanks/ man holes, L= Infections from diseased vectors from septic tanks/manholes etc, M= Stenches from undisposed waste bin, cans, etc., N= Infections from diseased vectors from undisposed waste bins, cans, etc., O= Smoke from indoor cooking, P= Air quality reduction due to overcrowding and ill-ventilation

4.3. Hypotheses testing

The test for each hypothesis showed intrinsic results for ANOVA as presented in Table 10. By aggregate measure, findings further established that students' coping ability with sanitary hazards had significant variation with socioeconomic variability such as age of students ($F_{(3,363)} = 4.090$, $p = 0.007^*$), ethnicity ($F_{(3,363)} = 3.381$, $p = 0.018^*$), childhood environment ($F_{(2,364)} = 7.207$, $p = 0.010^*$) and type of building currently lived in at home ($F_{(2,364)} = 10.736$, $p = 0.000^*$), respectively. This led to a rejection of the null hypotheses and an acceptance of the alternative hypotheses established

for these variables. Differences in students' coping ability with sanitary hazards, and other socio-economic variability such as gender, income, religion and type of building lived in during childhood were not significant (p -values equal 0.144, 0.110, 0.146 and 0.192 respectively).

The effect size measures as presented by the Eta-squared statistics (Table 10) indicated that each attribute of socioeconomic variability accounted for an effect size in students' coping ability with sanitary hazards. It implies that gender, age, income, ethnicity, religion, childhood environment accounted for by type of building lived in during childhood and type of building lived in at home

currently accounted for 0.006, 0.033, 0.24, 0.027, 0.0060, 0.038, 0.009 and 0.056 respectively. All of these variables have medium size effects on students' coping ability with sanitary hazards in hostels. Nevertheless, the type of building lived in

during childhood and childhood environment had the highest effects in determining the coping ability of students in respect of sanitary hazards in tertiary educational institutions while age, income and ethnicity ranked next in effects.

Table 10. Socioeconomic variability and coping ability with sanitary hazards (source: Authors' fieldwork data analysis, 2016)

Socioeconomic variability	ANOVA				Eta/Eta Square	
	df _{btw}	df _{wth}	F	P	η	η ²
Gender	1	365	2.145	0.144	0.006	0.006
Age	3	363	4.090	0.007*	0.181	0.033
Income	5	361	1.812	0.110	0.156	0.024
Ethnicity	3	363	3.381	0.018*	0.165	0.027
Religion	1	365	2.123	0.146	0.076	0.006
Childhood environment	2	364	7.207	0.010*	0.195	0.038
Type of building lived in during childhood	2	364	1.659	0.192	0.950	0.009
Type of building lived at home currently	2	364	10.736	0.000*	0.236	0.056

*significant level is 0.05(α = 5%, 2-tailed)

df_{btw} - Degree of freedom for between treatment group

df_{wth} - Degree of freedom for within treatment group

p-value - Probability value

5. Conclusion

This article has provided information that socioeconomic variability of students included gender, age, academic level, religion, ethnicity, and childhood environment; all of which have been used to determine how they coped with sanitary hazards in their respective hostels. It was apparent that there was a proportional representation of male and female genders in all the institutions. It was found that students less than 20 years old constituted the highest proportion of respondents in UI compared with those between 20 and 24 years which constituted the highest proportion in PolyIbadan and FCE. Most of the students were living below the poverty level. This is because an average student in any of the institutions was living on ₦300 per day which is approximately 1 dollar (US\$1). Considering the childhood environment of students, it was found that, more than two-thirds of students and more than two thirds in PolyIbadan and FCE lived in rural areas. On aggregate, the majority of respondents were raised in rural areas which are mostly attributed with a low quality of life for inhabitants as well as poor housing, environmental amenities and sanitation behaviour which always affects children's upbringing.

The analysis of student responses to sanitary hazards was examined in relation to conditions of hostel amenities such as toilet, bathroom, water, electricity, drains, and waste collection services etc.

Despite the availability of functional toilets, bathrooms, drains and waste disposal facilities among others, most facilities were in bad condition. An instance across the three institutions was the condition of toilets and drains which at some point in time some of these facilities were unkempt. The coping practices of students at those times were to seek alternative means by behaving in ways to adjust for their needs. Examples included defecating in open spaces and drains, bathing in a hostel's surroundings, disposing of solid waste and wastewater in a hostel's surroundings among others. These student behaviours could result into hazards such as odours, breeding of disease vectors and infections to which they have low coping abilities.

Results further revealed that the students' socioeconomic attributes such as type of building currently lived in at home and childhood environment had the highest influence on coping ability of students with respect to sanitary hazards in tertiary educational institutions. This supports the opinions of AKINDELE (2011), SPEARS & LAMBA, (2011) and OGUNDAHUNSI & ADEJUWON (2014) which state that the home environment is a good determinant of human behaviour and perception of it, which likewise involves coping ability or adaptability. Other causes include student maturity as determined by age, social class as determined by income, and culture as determined by ethnicity.

This article concludes that students' sanitation practices are attitudinal and behavioural as

shown by the influence their home environment had on them. It can be deduced that students are in need of environmental education, first of all, at entry level into tertiary education institutions. This should be packaged as part of their orientation programmes. Information regarding the structure, design and use of the residential halls with built-in amenities should be explicitly provided. Likewise, students should be provided with the regulations guiding the use and sanitation of hostels and overall school environment. On effecting this recommendation, the student's age, culture and income class should impact the contents of publications and methods of presentation during within the section on environmental education section for the orientation programme. This article further recommends that an environmental sanitation and health orientation programme for students should not only take place during orientation weeks for new students but should be a mandatory and continuous one for all students, using various ways of mass media, symposiums and seminars among others.

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