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RESEARCH ARTICLE

# Knowledge, perceptions and attitude towards open defecation and its health implications among residents in Ussa Local government Area, Taraba State, Nigeria

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**Abstract**
Background and Objective: Open defecation is the human practice of defecating in the environment rather than into a toilet. Open defecation is a public health menace and causes health problems such as diarrheoa, typhoid, cholera, etc., in areas where people defecate places other than toilets or latrines. This study was aimed at determining the knowledge, perception and practice of open defecation among residents in Ussa Local Government Area of Taraba State, Nigeria. Material and Methods: A cross-sectional study design was adopted and used for this study. Data were generated using a semi-structured questionnaire and an observational checklist. Data generated were collated, synthesized and analyzed using SPSS version 20. Results: The results obtained in this study showed that 260 (67.7%) had good knowledge of open defecation while 124 (32.3%) recorded poor knowledge. Most respondents 202 (53.6%) demonstrated positive perception about open defecation while 182 (46.4%) exhibited negative perception. Over two-third of the respondents 302 (78.6%) respondents indicated that they have defecated at least once in open space and only 110 (28.6%) have access to a toilet facility. Perceived health problems associated with open defecation practice as indicated by the respondents were mainly; malaria 341 (88.8%), typhoid 221 (57.6%) and cholera 210 (54.7%). It was also observed that 274 (71.4%) households do not have a toilet facility, 200 (69.0%) lack access to improved source of water supply, 356 (92.7%) household lack a drainage system, 308 (80.2%) had bushes around their surroundings, 256 (66.7%) had odour of excreta in the surrounding and 239 (62.2%) lack a proper waste storage facility and exhibit poor waste disposal. Conclusion: Findings in this study showed that respondents had good knowledge and exhibited positive perception about open defecation, but majority of the proportion confirmed to have defecated in open fields.

**Keywords:** knowledge; attitude; open defecation; health implications; residents; Ussa Local Government Area

## Introduction

Open defecation is the human practice of defecating in the environment rather than into a toilet. Open defecation is a public health menace and causes health problems such as diarrheoa, typhoid, cholera, etc., in areas where people defecate places other than toilets or latrines (Clasen, Boisson, Routray, Torondel, Bell, Oliver, Ensink, Freeman, Jenkins, Odagiri, Ray, Sinha, Suar, & Wolf-Peter, 2014). The term is widely used in literatures on water, sanitation, and hygiene (WASH) problems in low-income countries.

Eradicating open defecation is the main aim of improving sanitation worldwide and it is an indicator used to measure progress towards the Sustainable Development Goal (SDG6). Irrespective of availability of toilets, behavioral change efforts on human is needed to promote the use of toilets. Therefore, people need to be educated and convinced to desist from open defecation and use the toilets. The option of open defecation may be due to lack of access to toilets or cultural practices and these practices are common within countries where sanitation infrastructures are not available (Clasen et al, 2014).

Ending open defecation would be an important public health intervention and success to healthy living (WHO/UNICEF, 2014a). It has been reported that extreme poverty and lack of sanitation facilities have been linked with open defecation. Therefore, eradicating open defecation is thought to be an important medium to also eradicate poverty. This was due to the publication by the Joint Monitoring Programme for Water Supply and Sanitation (JMP) in their international year of sanitation (WHO/UNICEF, 2014b). Open defecation is a common

example of poor sanitation. Over the years, the number of people practicing open defecation has fallen by 21%, from 1.3 billion in 1990 to 1 billion in 2012 (WHO/UNICEF, 2019). These 1 billion people with no sanitation facility continued to defecate in gutters, bushes, bodies of water and open field, etc. Most people (90%) who practice open defecation live in rural areas, but the number of people living in urban areas is also increasing (WHO/UNICEF, 2014a). According to World Bank report in 2015, 39.84% of Indian population practice open defecation and it is known as the country with the highest number of people practicing open defecation (WHO/UNICEF, 2014a). Other countries with a high percentage of people practicing open defecation are Indonesia (63 million people), Pakistan (40 million people), Ethiopia (38 million people), Nigeria (34 million people), Sudan (19 million people), Nepal (15 million people), China (14 million people), Niger (12 million people), Burkina-Faso (9.7 million people), (WHO/UNICEF, 2014a; (WHO/UNICEF, 2010).

Open defecation is influenced by a number of reasons which include lack of space to build toilets, lack of income, seasonal factors, and poverty. The major challenges faced by the residents in pursue to end open defecation is the lack of human resources base for sanitation. Although people living in slums constitute the highest percentage of those without the access to toilets, the whole communities suffer the effect of open defecation (Spears, 2014). Open defecation is a serious public health threat to human health especially for children under five years. Fecal-oral route is the major cause of diarrhoea disease as well as infections. Open defecation was identified by the World Health Organization, (WHO) in the year 2014 to be the leading cause of diarrhoea deaths and a threat to human health globally, due to unimproved sanitation practices (WHO, 2013). It can also lead to malnutrition and stunted growth in children (Spears, Gosh & Oliver, 2017).

Open defecation perpetuates the vicious cycle of disease and poverty and is widely regarded as an insult to personal dignity (WHO/UNICEF, 2014b). It causes serious harm when done in areas with high population or camping. With the insanitary situation in rural areas, open defecation has become a challenge and thereby an important public health issue and an issue of human dignity when it occurs in densely populated areas (O'Reilly, 2016). About 1.1billion, people (15% of the global population) practice open defecation. On the 19$^{th}$ November, 2013, the United Nations General Assembly declared "World Toilet Day", to encourage changes in both human behaviors and policies on issues ranging from enhancing water management, creation of sanitation facilities, to ending open defecation (Afshan, 2013).

Research has also shown that the effect of open defecation is one of the most important factors of the groundwater sources pollution. The underground water is polluted when rain flushes feces that are dispersed in the environment into the water body (Tamberkar & Raigire, 2012).

Approximately, 46million Nigerians (25% of the country's population) practice open defecation, out of which, 33million live in the rural areas and 130million persons are using unimproved sanitation facilities and majority of those affected are rural dwellers (UN, 2014). The eradication of open defecation is the key strategy for morbidity and mortality control, particularly in children under the age of five years (5).

The general objective of this study was to assess the knowledge, perception and practice of open defecation among residents in Ussa Local Government Area of Taraba State, Nigeria. And the specific objectives were to: determine residents` knowledge of open defecation in Ussa Local Government Area of Taraba State; determine residents' perception of open defecation among respondents in the study area; determine the proportion of residents who practice open defecation in the study area; identify the factors influencing open defecation practice among residents in the study area; identify the perceived health problems associated with open defecation and assess the sanitation facilities and surroundings of residents in the study area.

## Material and Method

### Study Setting

The study area was Ussa Local Government Area of Taraba State. It has an area of 1495Km$^{2,}$ and a population of 92,017 as at 2006 census. This study was carried between March and June, 2022. Ussa Local Government Area is located in the southern part of Taraba State. It shares boundary with Donga Local Government Area by the North, Kurmi Local Government Area by the East, Republic of Cameroon by the South and Takum Local Government Area by the West. It has eight (8) political wards. These are Lissam 1, Lissam 2, Kwesati, Lumbu, Fikyu, Kpambo, Kpambo puri, Rufu. Ussa is predominantly inhibited by Kuteb people who are mostly farmers, local politicians, traders and civil servants.

### Study Design

A cross sectional descriptive study design was used for this study. This involved the administration of structured questionnaires and the used of observational checklist on sanitary facilities of respondents.

### Study Population

The study population include adults of both gender between 18years old and above in the study area.

### Sampling Procedure

A multi-stage sampling method was used to select wards, households and respondents under the following stages;

**Instrument for data collection**

The instrument for data collection was an interviewer administered structured questionnaire and an observational checklist.

**Method for Data Analysis**

Descriptive statistics was used to analyse the data obtained from questionnaire and the observational checklist. The responses were coded and analyzed. Data was analyzed using Statistical Package for Social Sciences, (SPSS) version 20. The results were expressed using descriptive statistics. Associations between variables were tested using Chi-square statistical test and significance level was set at 5%. It was interpreted and presented in tables, percentage, bar chart, and frequencies.

**Ethical consideration**

A letter of introduction was obtained from the Department of Public Health University of Calabar, Calabar. Ethical clearance was also obtained from the Department of Public Health Clearance Committee to seek for entry permission into the community through the village chiefs and clan heads in the study areas. Verbal informed consent was duly sought from every respondent. Participation was strictly voluntary; respondents were informed that they have the right to withdraw from the participation at any time without the fear of penalty. The respondents were assured of confidentiality and privacy. There was no required indication of names on the questionnaire to ensure anonymity.

**Results**

**Socio-demographic characteristics of the respondents**

All 384 copies of the questionnaire were returned for analysis giving a response rate of 100%. The results obtained showed that 202 (52.6%) respondents were females, 182 (47.4%) were males, 123 (32.0%) were aged between 26-30 years, 241 (62.8%) were married, 130 (33.9%) had secondary education, 150 (39.1%) were farmers and 319 (83.1%) were Christians (Table 1).

**Knowledge of open defecation among respondents**

Results on knowledge of open defecation showed that 339 (88.3%) respondents affirmed that they have knowledge of the meaning of open defecation out of which 227 (59.1%) defined open defecation as the practice of people defecating outside and not in designated toilet. A reasonable proportion of the respondents 235 (61.2%) indicated that open defecation is harmful to human health and highlighted possible effects on human health which include; emission of offensive odour 200 (85.1%), environmental degradation 184 (78.3%) and pollution of water bodies 118 (50.2%). Most respondents 317 (82.6%) affirmed that the practice of open defecation can be avoided (Table 2). On the average, 260 (67.7%) had good knowledge of open defecation while 124 (32.3%) recorded poor knowledge.

**Table 1:** Socio-demographic characteristics of the respondents (n=384)

| Variables | Number of respondents | Percentage |
|---|---|---|
| **Sex** | | |
| Male | 182 | 47.4 |
| Female | 202 | 52.6 |
| **Age (in years)** | | |
| 18-25 | 61 | 15.9 |
| 26-30 | 123 | 32.0 |
| 31-35 | 112 | 29.2 |
| 36+ | 88 | 22.9 |
| **Marital Status** | | |
| Married | 241 | 62.8 |
| Single | 135 | 35.2 |
| Divorced | 2 | 0.5 |
| Separated | 2 | 0.5 |
| Widow/widower | 4 | 1.0 |
| **Educational status** | | |
| No formal education | 67 | 17.4 |
| Primary | 103 | 26.8 |
| Secondary | 130 | 33.9 |
| Tertiary | 84 | 21.9 |
| **Occupation** | | |
| Farming | 150 | 39.1 |
| Fishing | 31 | 8.1 |
| Trading | 71 | 18.5 |
| Civil servant | 56 | 14.6 |
| Artisans | 45 | 11.7 |
| Unemployed | 31 | 8.1 |
| **Religion** | | |
| Christianity | 319 | 83.1 |
| Islam | 53 | 13.8 |
| Traditional religion | 12 | 3.1 |

**Table 2: Knowledge of open defecation among respondents**

| Variables | Number of respondents | Percentage |
|---|---|---|
| **Have knowledge of the meaning of open defecation** | | |
| Have knowledge | 339 | 88.3 |
| Do not have knowledge | 45 | 11.7 |
| **Total** | **384** | **100** |
| **Meaning of open defecation** | | |
| The practice if people defecating outside and not in designated toilet | 227 | 59.1 |
| The practice if people defecating outside and not in designated toilet | 112 | 29.2 |
| Do not know | 45 | 11.7 |
| **Total** | **384** | **100** |
| **Open defecation is harmful to human health** | | |
| It is harmful | 235 | 61.2 |
| It is not harmful | 104 | 27.1 |
| Do not know | 45 | 11.7 |
| **Total** | **384** | **100** |
| **Harmful effects of open defecation*** | | |
| Causes disease outbreak | 51 | 21.7 |
| Degrades the environment | 184 | 78.3 |
| Pollution of water bodies | 118 | 50.2 |
| Emission of offensive odour | 200 | 85.1 |
| **Practice of open defecation can be avoided** | | |
| It can be avoided | 317 | 82.6 |
| It cannot be avoided | 22 | 5.7 |
| Don not know | 45 | 11.7 |
| **Total** | **384** | **100** |

*Multiple responses

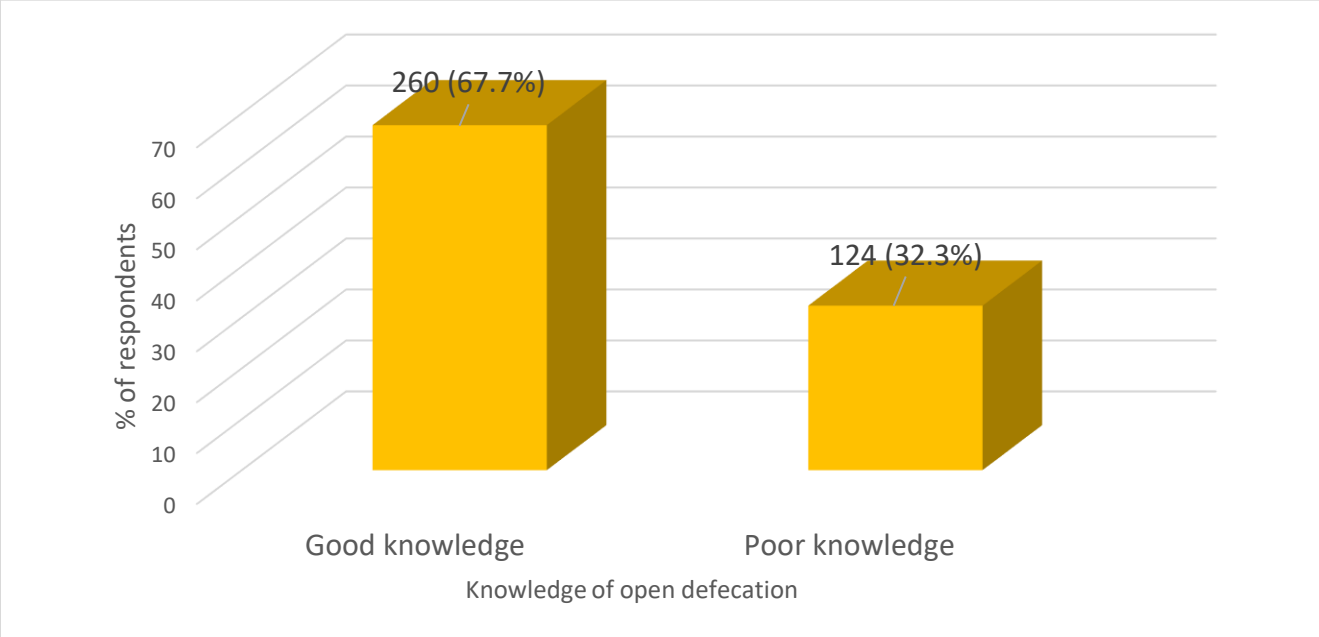


**Fig 1:** Knowledge of open defecation among respondents Perception of respondents about open defecation

Results on perception of respondents about open defecation shows that 45 (11.7%) strongly agreed to the statement that open defecation is dangerous to human and community health, 67 (17.4%) agree, 113 (29.4%) disagree and 93 (24.2%) strongly disagree; 58 (15.1%) strongly agree to the statement that open defecation is more hygienic than defecating in the toilet, 100 (26.0%) agree, 84 (21.9%) disagree and 112 (29.strongly disagree; 54 (14.1%) strongly agree to the statement that infection can be easily contacted through the use of public toilet, 79 (20.6%) agree, 122 (31.8%) disagree and 106 (27.6%) strongly disagree; 82 (21.4%) strongly agree to the statement that defecating on farmlands increases soil fertility and is beneficial to man and environment, 105 (27.3%) agree, 87 (22.7%) disagree and 69 (18.0%) strongly disagree; 66 (17.2%) strongly agree to the statement that open defecation contributes to environmental degradation, 111 (28.9%) agree, 105 (27.3%) disagree and 31 (8.1%) strongly disagree (Table 3). On the average, 202 (53.6%) respondents demonstrated positive perception about open defecation while 182 (46.4%) exhibited negative perception.

**Practice of open defecation among respondents**

Results on practice of open defecation shows that 302 (78.6%) respondents indicated that they have defecated at least once in bushes, gutters, streams or uncompleted buildings, out of which 195 (64.6%) respondents always defecates in the open space, 68 (22.5%) defecates sometimes/occasionally and 39 (12.9%) practice open defecation only when traveling/during an emergency. More than half of the respondents' 179 (59.3%) practice open defecation during the dry season while 123 (40.7%) practice theirs during the wet season (Table 4).

Of the 384 respondents, 110 (28.6%) have access to a toilet facility and pit latrine 71 (64.5%) was identified as the type of toilet mostly used. Reasons for not having access to a latrine/toilet as indicated by the respondents include; High cost of building an improved latrine/toilet 201 (73.4%), lack of enough space 42 (15.3%) and 31 (11.3%) felt it's not a priority (Table 4).

**Table 3:** Perception of respondents about open defecation (n=384)

| Variables | Strongly agree (%) | Agree (%) | I don't know (%) | Disagree (%) | Strongly disagree (%) |
|---|---|---|---|---|---|
| Open defecation is dangerous to human and community health | 45 (11.7) | 67 (17.4) | 66 (17.2) | 113 (29.4) | 93 (24.2) |
| Open defecation is more hygienic than defecating in the toilet | 58 (15.1) | 100 (26.0) | 30 (7.8) | 84 (21.9) | 112 (29.2) |
| Infection can be easily contacted through the use of public toilet | 54 (14.1) | 79 (20.6) | 23 (6.0) | 122 (31.8) | 106 (27.6) |
| Defecating on farmlands increases soil fertility and is beneficial to man and environment | 82 (21.4) | 105 (27.3) | 41 (10.7) | 87 (22.7) | 69 (18.0) |
| Open defecation contributes to environmental degradation | 66 (17.2) | 111 (28.9) | 71 (18.5) | 105 (27.3) | 31 (8.1) |

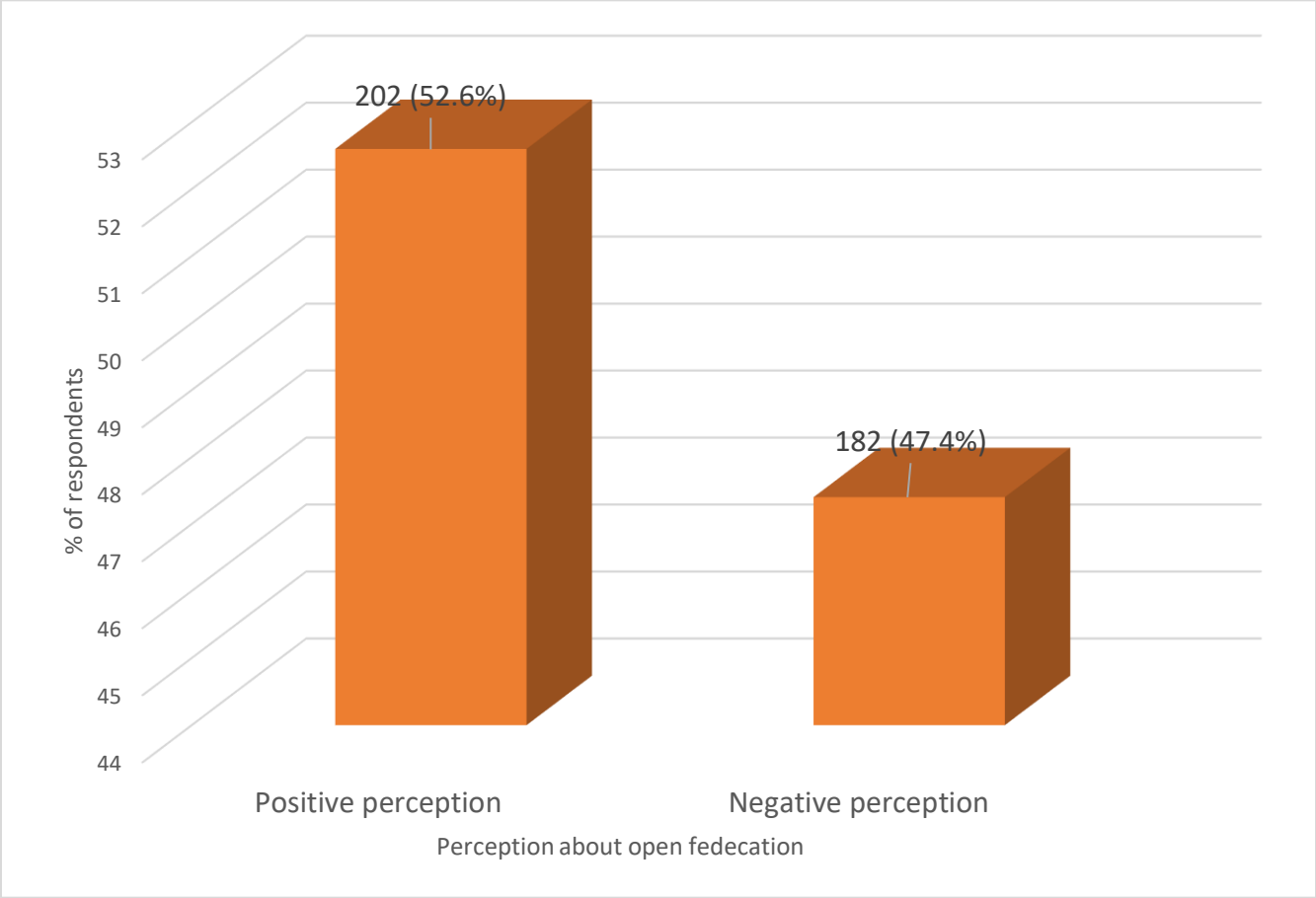


**FIG 2:** Perception of respondents about open defecation

**Factors influencing open defecation practice among respondents**

Factors influencing open defecation practice as indicated by the respondents were mainly; low cost 300 (99.3%), requires little or no maintenance 281 (93.0%), lack of access to toilet facility 274 (90.7%) and convenience 256 (84.8%) (Fig. 3).

**Perceived health problems associated with open defecation practice**

Perceived health problems associated with open defecation practice as indicated by the respondents were mainly; malaria 341 (88.8%), typhoid 221 (57.6%), cholera 210 (54.7%) and dysentery 87 (22.7%) (Fig. 4).

**Assessment of sanitary facilities and general surrounding of households**

Of 384 household surveyed, 110 (28.6%) households had a toilet facility of which 38 (34.5%) were pit latrine without cover, 33 (30.0%) were pit latrine with cover and 31 (28.2%) were swat flush, 8 (7.2%) were water system closet. Of the 110 toilet facilities, 58 (52.7%) toilets, were sanitary while 52 (47.3%) were unsanitary. Regarding water supply, 290 (75.1%) households have access to water supply of which 200 (69.0%) lack access to improved source of water supply. In terms of general surrounding, 356 (92.7%) household do not have a drainage system, 308 (80.2%) had bushes around their surroundings, 118 (30.8%) had stagnant water, 256

(66.7%) has odour of excreta in the surrounding and 239 (62.2%) do not have a proper waste storage facility and exhibit poor waste disposal (Table 5).

**Table 4:** Practice of open defecation among respondents

| Variables | Number of respondents | Percentage |
|---|---|---|
| **Ever defecated in bushes, gutters, streams or uncompleted buildings** | | |
| Have defecated | 302 | 78.6 |
| Have not defecated | 82 | 21.4 |
| **Total** | **384** | **100** |
| **Frequency of defecating in the open space** | | |
| Always | 195 | 64.6 |
| Sometimes/Occasionally | 68 | 22.5 |
| Only when traveling/during an emergency | 39 | 12.9 |
| **Total** | **302** | **100** |
| **Period of the year individuals defecate in open space** | | |
| Wet season | 123 | 40.7 |
| Dry season | 179 | 59.3 |
| **Total** | **302** | **100** |
| **Have access to a latrine/toilet** | | |
| Have access | 110 | 28.6 |
| Do not have access | 274 | 71.4 |
| **Total** | **384** | **100** |
| **Type of latrine/toilet** | | |
| Water system closet | 8 | 7.2 |
| Pit latrine | 71 | 64.5 |
| Swat flush | 31 | 28.2 |
| **Total** | **110** | **100** |
| **Reasons for not having access to a latrine/toilet** | | |
| Lack of enough space | 42 | 15.3 |
| High cost of building an improved latrine/toilet | 201 | 73.4 |
| Not a priority | 31 | 11.3 |
| **Total** | **274** | **100** |

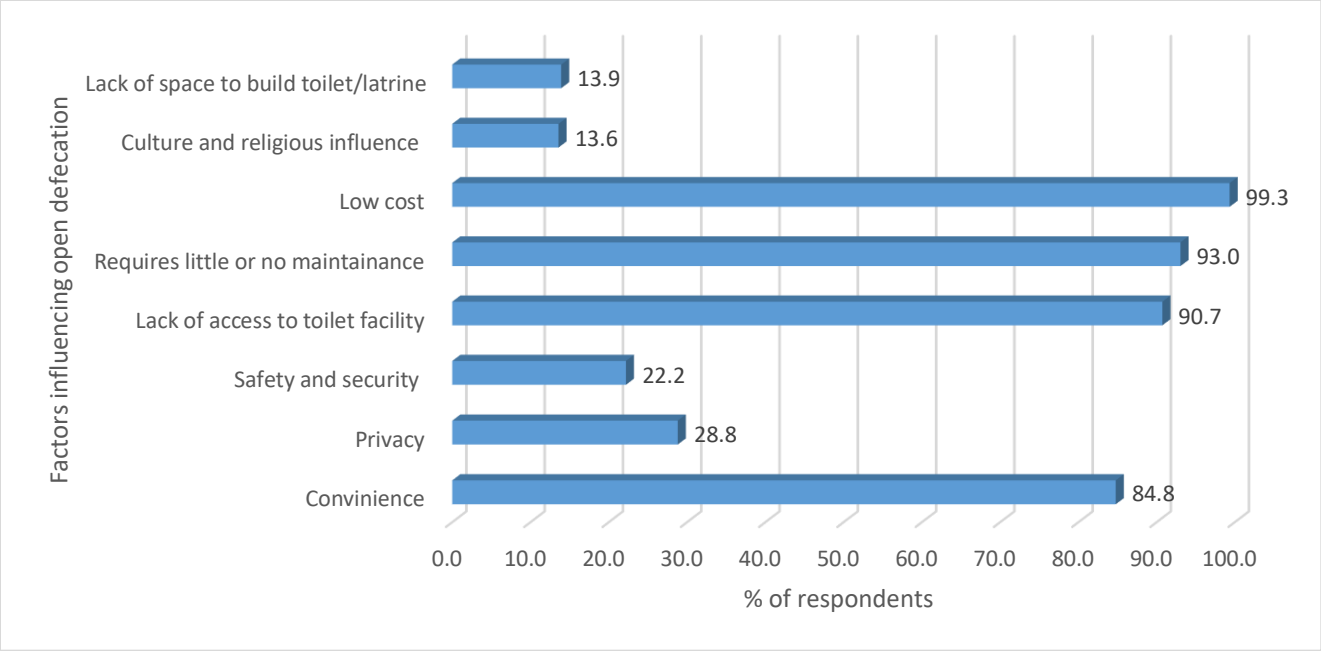


**Fig 3:** Factors influencing open defecation practice among respondents

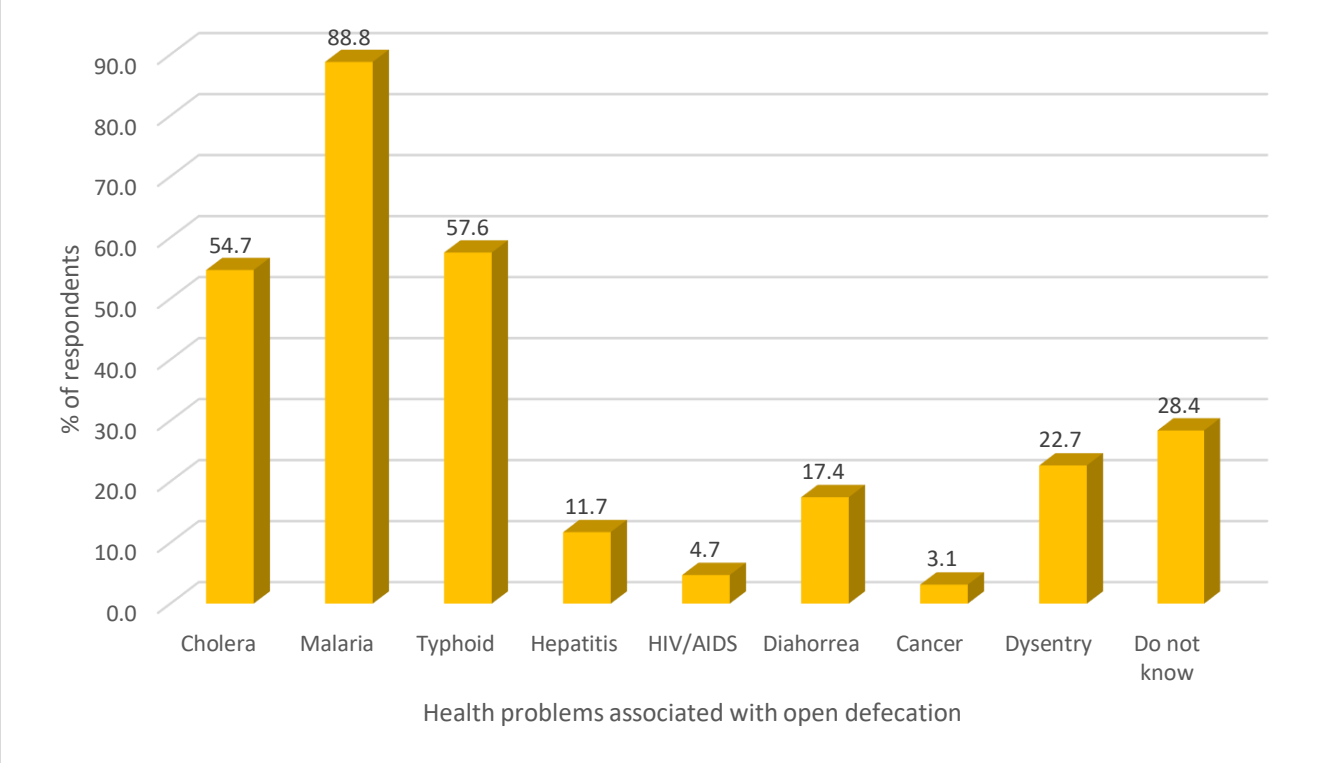


**FIG 4:** Perceived health problems associated with open defecation practice

**Table 5:** Assessment of sanitary facilities and general surrounding of households

| Variables | Number of respondents | Percentage |
|---|---|---|
| **(A) Toilet facility** | | |
| **Availability of toilet facility** | | |
| Available | 110 | 28.6 |
| Not Available | 274 | 71.4 |
| **Total** | **384** | **100** |
| **Type of toilet facility available** | | |
| Pit latrine with cover | 33 | 30.0 |
| Pit latrine without cover | 38 | 34.5 |
| Swat flush | 31 | 28.2 |
| Water system closet | 8 | 7.2 |
| **Total** | **110** | **100** |
| **Sanitary condition of toilet facility** | | |
| Sanitary | 58 | 52.7 |
| Unsanitary | 52 | 47.3 |
| **Total** | **110** | **100** |
| **Water supply facility** | | |
| **Availability of water supply facility** | | |
| Available | 290 | 75.5 |
| Not Available | 94 | 24.5 |
| **Total** | **384** | **100** |
| **Source of water supply** | | |
| Improved | 90 | 31.0 |
| Unimproved | 200 | 69.0 |
| **Total** | **290** | **100** |
| **C) General surrounding** | | |
| **Availability of drainage system** | | |
| Available | 28 | 7.3 |
| Not Available | 356 | 92.7 |
| **Total** | **384** | **100** |
| **Sanitary condition of drainage system** | | |
| Sanitary | 9 | 32.1 |
| Unsanitary | 19 | 67.9 |
| **Total** | **28** | **100** |
| **Bush in the surrounding** | | |
| Present | 308 | 80.2 |
| Absent | 76 | 19.8 |
| **Total** | **384** | **100** |
| **Proper waste storage and disposal** | | |
| Available | 145 | 37.8 |
| Not available | 239 | 62.2 |
| **Total** | **384** | **100** |
| **Odour of excreta in the surrounding** | | |
| Present | 256 | 66.7 |
| Absent | 128 | 33.3 |
| **Total** | **384** | **100** |
| **Presence of stagnant water** | | |
| Present | 118 | 30.8 |
| Not present | 266 | 69.2 |
| Total | **384** | **100** |

**Discussion**

The practice of open defecation is a global issue due to its implication on human health, dignity and the environment. It is mostly prevalent in third world countries including Nigeria and significantly fuels the spread of infectious diseases, cause the proliferation of neglected tropical diseases (trachoma, schistosomiasis, intestinal worms, etc.) and increase cases of malnutrition especially amongst the rural populace (Ngwu, 2017). Ensuring an open defecation-free environment requires a strong synergy between the community and health professionals. In the light if this, understanding their perception about open defecation and identifying the factors influencing open defecation practice would be a perfect road-map to avert the practice of open defecation in Nigeria.

As documented in the current study, it was observed that two-third of the respondents 260 (67.7%) had good knowledge of open defecation especially in the aspect of defining open defecation, acknowledging that open defecation is harmful to human health and highlighting the possible effects of open defecation practice which include; emission of offensive odour, environmental degradation and pollution of water bodies (Table 2). The exhibition of high knowledge level of open defecation among respondents could be attributed to their routine observation of events and practices within their environment, personal/family members/friends experiences and access to health promotion information. This finding was congruent with a recent Ghanaian study where the study participants demonstrated high knowledge of open defecation (Asare, Gyan &Denteh, 2019).

More than half of the respondents 202 (52.6%) demonstrated positive perception about open defecation whiles the remaining 182 (47.4%) exhibited negative perception. Respondents' perception about open defecation may be influenced by their belief system, cultural practices, superstition, myths and religious affiliations. Each of these perspectives may exert significant level of influence (whether positive or negative) on their level of practice. This suggests that interventions on achieving an open defecation-free environment should be tailored towards changing behavioural patterns of individuals who frequently practice open defecation. This finding was similarly reported by Asare, et al. 2019, where respondents perceived open defecation as bad practice. However, it is worrisome where respondents in the current study believe that defecating on farmlands increases soil fertility and felt is beneficial to man and environment. This shows pure negligence of the effect of open defecation on human health. The low risk perception of the adverse effects of open defecation on human health may largely account for their negative perception towards open defecation practice.

More than two-third of the respondents 302 (78.6%) indicated that they have defecated at least once in bushes, gutters, streams or uncompleted buildings, out of which 195 (64.6%) respondents frequently defecates in the open space (Table 4). This finding was similarly reported in other studies but the percentage of open defecation was lower than that reported in the current study (Verma, 2017; Anuradha, Dutta, Raja, Lawrence, Timsi & Sivaprakasam, 2017; Panda, Chandrakar, & Soni, 2017). The high prevalence reported in the current study suggests that open defection is a common practice in the study area with a mix of lifestyle, culture and ancestral practices. Open defecation tends to be more practiced in the dry season than during the wet season (Table 4). The reason may be linked to the fact that wet season (especially during heavy rainfall) restrict or limit movement and operation of activities. As a result, respondents who do not have access to a toilet facility either defecate in a polythene bag or bucket and dispose it by throwing into the busy or in flowing water. In essence, dry season tends to be more favourable to practice open defecation than during wet season. It was also documented that only one-fourth of the respondents have access to a toilet facility and pit latrine was identified as the most type of toilet used. Main reasons for not having access to a latrine/toilet as indicated by the respondents include; high cost of building an improved latrine/toilet, lack of enough space and some felt it's not a priority (Table 4).These reasons may be linked to respondents' socio-economic status where the poorer population suffer most from lack of access to sanitation facilities. This finding corroborates with that of Anuradha et al., 2017, where similar reasons for not having access to a latrine/toilet were documented. The significant lack of access to toilet facilities confirms the high prevalence of open defecation practices among respondents in the current study. Factors influencing open defecation practice as indicated by the respondents were mainly; low cost, requires little or no maintenance, lack of access to toilet facility and convenience. This finding is congruent with other studies where similar factors influencing open defecation were documented (Asare, et al. 2019; Verma, 2017). Contrariwise, a Keyanian mixed-method study identified culture and poverty as major factors contributing to open defecation practice (Busienei, Ogendi & Mokua, 2019). Unlike the modern toilet facilities, defecating in open fields do not require any cost implication or any form of maintenance. This is often considered in households when building a latrine or toilet facility is less prioritized. Lack of access to toilet facility has been identified as a contributory factor to open defecation practice. This was evident during the sanitary inspection of households conducted in the current study where only one-fourth of households had a toilet facility (Table 5). In the light of this, communities and settlements without access to toilet facilities would continuously practice open defecation until a lasting solution is provided to address end this practice. Even with the availability of toilet facilities, once the users outweigh the number of toilet facilities available, open defecation would still be practice. Hence, adequate provision of toilet facilities can significantly curb open defecation practice.

Convenience as a factor contributing to open defecation could be linked to the fact that available toilet facilities is always dark, filthy, smelling, poorly ventilated and lack privacy. This was confirmed during the sanitary inspection of households where out of 110 households who had a toilet facility, toilet facilities in 52 households were unsanitary (Table 5). The unhygienic conditions of some toilet facilities constantly encourage the practice of defecating in open fields. Hence, while it is imperative to ensure the provision of toilet facilities for household use, effort should be tailored towards constructing user-friendly toilet facilities as well as devise an approach to ensure the toilet facilities is constantly in hygienic condition.

Perceived health problems associated with open defecation practice as indicated by the respondents were mainly; malaria, typhoid, cholera and dysentery (Fig 2). This finding supports that of Anuradha et al. 2017, where respondents knew at least one disease associated with open defecation practice. A number of health problems are largely associated with infected human excreta which contain several harmful organisms (Saleem, Buedett & Heaslip, 2019). The identified health problems often affects a significantly proportion of the poorer population who do not have access to improved sanitation facilities (Peprah, Baker, & Moe, 2015; Njuguna & Muruka, 2017). The diseases are usually transmitted via feacal-oral route which arise from consumption of contaminated agricultural food products and underground water sources. Open defecation also propel flies and rodent infestation as well as emission of offensive odour which account for why malaria was the most identified health problem associated with defecation in open fields.

Regarding sanitary facilities and general surrounding of households, more than two-third of the respondents lack access to toilet facilities, improved source of water supply, drainage system, proper waste storage facility and exhibit poor waste disposal and had bushes and odour of excreta around their surroundings, (Table 5). This results showed that a significantly proportion of the rural populace still lack access to basic sanitation facilities. Lack of these facilities increases their vulnerability to contract infectious diseases within their vicinity and continually encourage the practice of open defecation. A healthy and open defecation-free environment can only be achieved if these sanitation facilities are adequately provided in rural communities.

## Conclusion

Open defecation is still a common practice in rural Nigeria especially where there is significant lack or limited access to improved sanitation facilities. The drive to protect human health and improve environmental sanitation would essentially require ending open defecation practice. Findings in this study showed that respondents had good knowledge of open defecation, exhibited positive perception about open defecation, but majority of the proportion confirmed to have defecated in open fields. It was also observed that basic sanitation facilities in the study area such as toilets, access to improved water source, drainage system were not available in two-third of the household surveyed. Hence, achieving an open defecation-free environment would require the collaborative effort of relevant stakeholders.

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