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Original Research Article

Sociological Assessment of Knowledge, Attitudes and Practice of Open Defecation and its Impacts on Public Health in Rural Communities of Yobe State, Nigeria

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Abstract: Open defecation has been a major sanitation and social health issue in most developing countries, especially in the rural populations where there is a low access to better sanitation structures. Among the countries where people engage in open defecation, Nigeria has one of the best population and rural people are most affected as a result of poverty, lack of proper sanitation facilities, and socio-cultural reasons. This paper will give a sociological evaluation of knowledge, attitudes, and practices (KAP) on open defecation and explore the implication of open defecation on the general health of the rural population in Yobe State, Nigeria. The study was based on a descriptive cross-sectional survey that included the chosen communities in rural areas in Yobe State. The use of observational methods, structured questionnaires, and key informant interview were used to collect data. The research evaluated the degree of knowledge on sanitation and hygiene, attitude on open defecation and sanitation practices of community members. The results show that despite the number of respondents who are aware of the risks of poor health related to open defecation, socio-economic pressures, cultural beliefs, inability to access sanitation facilities, and absence of proper environmental sanitation facilities are the reasons why the practice continues to be common among the respondents. The research also indicates that open defecation is a major contributor to the increased waterborne infections like cholera, diarrhoea, dysentery and typhoid fever in rural populations. Poor sanitation and contaminated water sources make children below five years very susceptible to the diseases. Disposal of human waste in open areas was also noted to be a significant cause of poor health outcomes by environmental pollution. The study highlights the necessity of combined interventions that would target infrastructural and behavioural elements of sanitation. The availability of cheap sanitation facilities, community-based sanitation programs, health education campaigns, and reinforcement of the government policies to eradicate open defecation should be among such interventions. The research concludes that eradication of open defecation in rural populations will not be possible without a mixture of infrastructural development, community involvement and active involvement of the community to create a behavioural change among the population, along with strong institutional decision on the same.

Keywords: Assessment, Attitudes, Open Defecation, Public Health, Rural Communities.

INTRODUCTION

Sanitation is a key component of the advancement of human dignity, environmental sustainability, and the promotion of the population health. Availability of safe sanitation facilities is vital in the prevention of communicable diseases as well as enhancement of general quality of life within communities. Nonetheless, even with advances in sanitation coverage in the entire world, millions of individuals across the world still have no access to better sanitation structures and still engage in open defecation.

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Open defecation is the habit of defecating in open places by emptying into the fields, bushes, water bodies, forests, roadsides, and not using toilets or other advanced sanitation systems. The practice is very risky to health and environment as human faeces are known to carry dangerous pathogens which can easily spread to water, soil, food and household set ups. These are also pathogens which are able to spread diseases which are not only dangerous to individuals but also to whole communities.

Defecation is a significant social health issue in the world and specifically in developing nations where sanitation facilities are poor. In South Asia and Sub-Saharan Africa, hundreds of millions of individuals continue to indulge in open defecation with reports by the world sanitation showing that defecation is most common there. International development programs like Sustainable Development Goals (SDGs) have heightened efforts to end open defecation especially Goal 6 which is to achieve universal access to water and sanitation.

Nigeria is a country with a great sanitation crisis and a high percentage of the population is not able to access better sanitation systems. This is especially so in rural populations, which are poorly serviced by infrastructure, poverty and are poorly accessed by public health facilities. Most of the rural households use the open fields, bushes and bodies of water near the area to defecate because there are no toilets.

Open defecation is a grave health issue to the populace. The human waste placed in the open areas will be contaminated in the sources of water that are used to drink, cook, and undertake baths. The consumption and use of contaminated water in households may cause the spread of waterborne diseases including cholera, typhoid fever, diarrhoea and dysentery. These illnesses are associated with high morbidity and mortality especially in the children who are below five years.

Besides the health effects, there are social and environmental effects of open defecation. Human waste in the places of accommodation adds to the pollution of the environment and poor living conditions. Females, especially girls, are at high risk whenever using open defecation since they are usually compelled to walk long distances in search of isolated areas which predisposes them to harassment and violence among other security related threats.

In the north of Nigeria, Yobe State is among the places, where the issue of open defecation is especially acute. Poverty and insufficient government funding as well as environmental issues in many rural communities in the region have reduced the sanitation infrastructure. This issue is also enhanced by the culture and societal practices that dictate the behaviour of sanitation.

Yobe State is a rural area in northeastern Nigeria and most of the communities in this region are dependent on agriculture and keeping of livestock as the main livelihood. Insecurity and displacement occasioned by insurgency has also been a socio-economic problem to the state because it has hampered the development of infrastructure and delivery of services to people. Consequently, most societies do not have access to basic amenities such as clean water and sanitation.

The sociological factors that can help in understanding sanitation behaviour are critical in making successful interventions that will help in eradicating open defecation. In public health research, knowledge, attitudes and practices (KAP) studies are usually applied to evaluate the level of community awareness, perception, and behaviour in regard to health matters. Through the study of the knowledge, attitudes, and practices of rural dwellers about open defecation, the researcher will be able to understand the factors that underlie the practice and come up with interventions that may be able to counter the challenges.

This paper hence aims at evaluating knowledge, attitudes and practices associated to open defecation amongst the rural inhabitants of Yobe State and issues the public health consequences of the practice. In particular, the study will be conducted with the purpose to identify the awareness of the subject of sanitation and hygiene, socio-economic and cultural factors that affect the level of sanitation, and health risks of open defecation in rural communities.

It is hoped that the study will serve as a contribution to the available literature on sanitation and population health and also offer practical suggestions on policies, government health professionals, and development agencies that aim to eradicate open defecation in Nigeria.

LITERATURE REVIEW

Concept of Open Defecation

This is the practice of disposing human faeces in open places instead of their elimination via toilets or latrines. The habit is prevalent in localities with low levels of sanitation facilities or where none exist. It is accepted that it is a significant environmental and population health challenge in most of the developing nations.

Feces of human beings harbor a great number of disease-causing microorganisms such as bacteria, viruses and parasites. Faecal material deposited in open areas tends to easily contaminate the water sources, the soil, crops and food with these pathogens. This contamination poses more danger of spreading of disease in communities.

It has been discovered that open defecation was one of the significant contributors of sanitation-related

diseases. Sanitation conditions lead to the dissemination of pathogens in various ways among them being by drinking dirty water, flies which transmit pathogens in areas of faeces to food and direct contact with contaminated soil.

Children that stay in communities where open defecation is common are at a very high risk of health. Contamination of the surrounding may cause frequent infections, malnutrition, and physical and cognitive retardation. Studies have demonstrated that stunting and poor growth of children in developing nations are related to low sanitary conditions.

The open defecation is common in most regions of the world despite the world trying to enhance sanitation access. The governments, international organizations and non-governmental organizations have put in place different interventions to ensure they can instill better sanitation practices. These interventions involve sanitation sensitization, building of the public toilets and community-based sanitation program that aims at promoting behaviour change.

The prevalence of open defecation globally is 3.2.

The practice of open defecation is still dominant in the most regions of the globe even with development of sanitation. Statistical data on sanitation in the world show that hundreds of millions of individuals do not have access to enhanced sanitation. Most of them are living in the rural communities of developing nations.

The rate of open defecation in Sub-Saharan Africa is among the worst in the world. The rapid population growth, urbanization and low-density infrastructure development have led to sanitation problems in the area. The resources available to most of the rural communities do not have the technical aspect and financial resources to build better sanitation facilities.

In reaction to the sanitation crisis that is being experienced by the international community, the international development agencies have adopted various programs that have focused on enhancing access to sanitation. Among the most demanding programs is the Sustainable Development Goals (SDGs) which encompass a particular goal of attaining universal access to sanitation by 2030.

One of the most popular methods of getting rid of the open defecation is Community-Led Total Sanitation (CLTS). The CLTS strategy is aimed at mobilizing the communities in order to engage in joining to drop the habit of open defecation within their communities through creation of awareness on the health and environment effects of the poor sanitation habits.

Open Defecation in Nigeria

One of the nations that have the largest population of the people who practice open defecation is Nigeria. Despite the advancements in the country with regard to sanitation infrastructure, millions of Nigerians have no access to safe sanitation amenities.

Open defecation is especially common in the rural communities where there is a high level of poverty and the development of infrastructures is minimal. Rural areas lack many households that can afford to have toilets built because of the costs involved. This has led to the defecation in open areas like bushes, fields and the nearby water bodies.

The governmental response to the sanitation crisis in Nigeria consists of national sanitation policies, campaigns on the health of the population, and various collaborations with the international development organizations. The success of these efforts has however been hampered by lack of proper funding, poor institutional capacity and socio-cultural barriers.

Open Defecation Determinants in Rural Communities.

The existence of open defecation in most rural areas is as a result of a form of socio-economic, cultural, environmental and infrastructural factors. These determinants are necessary in understanding how to develop effective interventions to end the practice.

Unavailability of better sanitation facilities is one of the greatest factors that determine open defecation. Lack of access to toilets in rural areas is connected with the lack of financial resources and inadequate infrastructure in households. Research has indicated a lower income level household is less likely to develop a better sanitation system, thus raising the chances of open defecation (Osumanu, Kosoe, & Ategeeng, 2019).

Sanitation behaviour is directly associated with poverty. The belief of many rural households is that basic needs are more important than sanitation infrastructure like food, shelter, and clothing. Subsequently this has led to diminishing the priority of investment in household toilets. Low-income families may be prohibited by the cost of building better latrines, purchasing materials and maintaining sanitation facilities.

Education and awareness is another determinant. The more educated the person the more likely they are going to be knowledgeable of the health hazards that come with poor sanitation and thus more apt to practice better sanitation habits. On the other hand, people with low education might not have sufficient information regarding the connection between sanitation and disease spread (Garn, Sclar, Freeman, Penakalapati, Alexander, Brooks, Rehfuess, Boisson, and Clasen, 2017).

The cultural beliefs and traditional practices also have a great influence on the sanitation behaviours. Open defecation is a commonplace or even accepted practice in some communities which have been practiced over generations. Any behaviour change can be resisted by such social norms despite the availability of better sanitation facilities.

Sanitation practices can also be affected by the environmental conditions. Indicatively, regions where the water-table is high, or where the soil is loose, will have little trouble in building pit latrines. Floods can destroy sanitation facilities easily and thus do not provide room to households to invest in constructing their toilets in flood-prone areas.

Moreover, the patterns of population density and settlement shape the attitudes towards sanitation. In rural areas with low populations, one might find open defecation not a big issue because of the open spaces. Nevertheless, the health risks linked with environmental pollution become worse with rise in population density.

The development of sanitation is also a significant factor with regards to government policies and institutional support. The efforts towards the elimination of the open defecation can be slowed down by the weak implementation of the sanitation policies, insufficient funding of 3.5 Open Defecation as a Public Health Problem.

The effects of open defecation on the general health are extensive. Due to the poor disposal of human waste, a habitat that promotes the spread of many infectious diseases is formed.

Diarrheal disease is one of the most prevalent health effects of open defecation. In developing countries, diarrhea has been one of the greatest causes of child death under the age of five. The pollution of water sources by human feces exposes people to the threat of consuming pathogens that can lead to gastrointestinal infections (World Health Organization, 2022).

Cholera is another serious health issue that is a severe diarrheal infection resulting in cholera diarrhea caused by Vibrio cholerae bacteria. Poor sanitation and polluted water sources are usually associated with cholera epidemic. The open defecation communities are especially susceptible to the cholera epidemics due to the fact that the fecal contamination can easily find its way into the water systems.

The open defecation also helps in the transmission of intestinal worm infections such as the roundworms, hookworms and whipworms. The parasitic infections arise when the people are in contact with infected soil or when they take food that has the eggs of the parasites. Children are especially vulnerable to such infections due to the fact that they often play in polluted places.

Having a habit of being exposed to diseases that are related to sanitation may result into malnutrition and poor physiological growth. Those who experience frequent diarrheal infections also have a low uptake of nutrients, which will result in retarded development and impaired immunity.

In addition to physical health impacts, open defecation may also be psychosocially affected, especially to women and girls. Women in most communities are forced to walk long distances to get isolated places to defecate usually in early mornings or even late afternoons. This exposes them to the dangers of being harassed, assaulted and bitten by snakes.

Open defecation also contaminates the environment leading to the impact on agriculture and water quality. Plants planted on polluted soils might have pathogens that are dangerous to the consumers. Equally, pollution of drinking water, rivers and streams may cause the entire community to be exposed to diseases.

There are also economic implications of bad sanitation. Poor sanitation causes diseases that in turn raise both healthcare expenses and lost productivity, as well as, diminish growth. The impacted families in terms of sanitation related diseases might be strained financially by the medical cost and the lost income.

Empirical Review

Many studies have analyzed the correlation between sanitation level and health results of the population in developing nations. These empirical researches offer good understanding of the determinants of the open defecation and the cost-effectiveness of sanitation measures.

Ebimgbo *et al.,* (2019) have developed a research concerning knowledge and perceptions regarding open defecation in rural areas in southeastern Nigeria. The research observed that despite the fact that the majority of the residents were sensitive to the health dangers of open defecation, the unavailability of air clean facilities and financial limits were significant contributors to continuation of the act.

Osumanu *et al.,* (2019) studied the socio-economic factor of open defecation in rural Ghana. Their results showed that household income, level of education and accessibility to sanitation facilities were important predictors of sanitation behaviour.

Garn *et al.,* (2017) conducted a study that explored the association between access to sanitation and child health in a number of developing countries. The researchers concluded that better sanitation facilities had

a great impact of reducing the prevalence of diarrheal diseases in children.

Spears (2013) examined the connection between open defecation and child stunting in India. The researchers came to a conclusion that those communities where open defecation was high had much more malnutrition and stunted growth in children.

Abubakar (2018) had a study on the sanitary practices in northern Nigeria and discovered that open defecation was closely linked with poverty, low education, and the deficiency of sanitary facilities.

On the same note, Adefemi and Awoyemi (2020) investigated sanitation behavior among rural people in southwestern Nigeria. Their research revealed that community-based sanitation education initiatives had a high impact on the enhancement of sanitation practices among locals.

This was another research article that was carried out by Oloruntoba (2019) on the influence of sanitation on water quality on rural communities in Nigeria. It was found out that open defecation had a major impact of contaminating water sources that are used to drink and carry out domestic activities.

Huda *et al.,* (2012) tested the efficacy of community-based initiatives of total sanitation on the reduction of open defecation in Bangladesh. The researchers discovered that community involvement and collective action was vital in the attainment of open defecation free communities.

Clasen *et al.,* (2014) study measured the effects of sanitation interventions on the health outcomes in rural India. The results revealed that sanitation interventions involving development of infrastructures as well as behavioural change interventions were more effective to reduce open defecation.

A study by Jenkins and Curtis (2005) found out the relevance of social norms in determining the sanitation behaviours. In their research, they established that people were more susceptible to embrace better hygienic practices when the community leaders promoted hygienic behaviours.

In Ethiopia, Tesfaye *et al.,* (2018) used awareness campaigns on sanitation to reduce the open defecation. The researchers found that health education was a significant way of enhancing knowledge and attitude towards sanitation among the rural dwellers.

On the same note, research undertaken in Kenya by O'Reilly and Louis (2014) revealed that community based sanitation initiatives were useful in mobilizing the community to build and use household latrines.

A study conducted in Nepal by Shrestha *et al.,* (2018) showed that the government subsidies to latrine construction had a strong impact on the context of the rural sanitation coverage.

A study by Patil *et al.,* (2014) in India also assessed the effectiveness of an extensive sanitation occupation, which targeted to decrease the open defecation. The authors concluded that despite the fact that the program led to the growth in the number of latrines, a lasting behavior change would be needed with the continued work in the communities.

Ojo and Oloruntoba (2021) discussed the connection between waterborne diseases and screening of sanitation practices in rural populations in Nigeria. They found that in communities where there were high rates of open defecation, there were very high rates of cholera and diarrheal diseases.

The same researchers conducted a study identifying that poor sanitation practices led to high costs of healthcare and a poor productivity of rural societies (Adeyemi and Adebayo, 2020).

On the whole, empirical research undoubtedly shows that the factors affecting open defecation are based on a set of socio-economic, cultural, and infrastructural factors. Sectoral interventions are therefore necessitated by effective interventions to mitigate behavioural and structural obstacles to better sanitation.

This growing body of empirical research highlights the importance of integrating public health education, sanitation infrastructure development, and community participation in efforts to eliminate open defecation. Interventions that address only one aspect of the problem are unlikely to achieve sustainable results.

Theoretical Framework

The analysis of sanitation behaviour should be conducted with references to the social and psychological determinants that affect the choice and behaviour of individuals. Two major theoretical perspectives will be the basis of this study: Health Belief Model (HBM) and Social Norms Theory. These theories can be used to understand why people still engage in open defecation despite their knowledge of the adverse health effects of this habit.

Health Belief Model (HBM)

Health Belief Model is a tool of explaining health related behaviour that is commonly applied in the research on public health. It was initially formulated by Rosenstock in the 1950s to have a better understanding of the reasons why people do not take precautionary measures towards health (Rosenstock, 1974).

The Health Belief Model is based on the assumptions that the health behaviours of people are dependent on the perceptions of health risks and perceived benefits of preventive measures. The model suggests that people are more prone to engage in healthy behaviours when they feel susceptible to some health condition and they hold the view that preventive action will lower the risk.

The model has a number of major components:
Perceived Susceptibility: This is the perception of an individual regarding the potential chances of having a health issue. Under the sanitation context, people who perceive that they can be affected by certain diseases because of lack of proper sanitation have higher chances of practicing better hygienic measures.
Perceived Severity: This is how serious a health problem is perceived by a person. By feeling that sanitation-related illnesses like cholera or typhoid posed a serious danger to health and well-being, people might be influenced more to embrace safe sanitation regulations.
Perceived Benefits: The perceived benefits are the subjective view of a person that a given health action will decrease the risk of sickness. As an example, one might be convinced that building and using a toilet will minimize the contact with disease-causing pathogens.
Perceived Barriers: Perceived barriers are the challenges that make people fail to embrace health-promoting behaviours. Poverty and unavailability of sanitation facilities and culture of rural communities can deter people to build or use toilets.
Cues to Action: External triggers are the cues to action, which stimulates people to engage into healthy behaviours. These can be public health campaigns, community sanitation campaigns or health education campaigns.
Self-Efficacy: Self-efficacy denotes an individual confidence to perform a certain behaviour. People who feel that they possess the resources and capacity to build and sustain sanitation structures are likely to embrace better sanitation methods.

Health Belief Model is the model that is more applicable in this study since it assists in understanding how knowledge and perceptions support or affect the choice of sanitation behaviour in rural populations.

Social Norms Theory

The Social Norms Theory is concerned with how the behaviours of individuals are shaped by the expectations and behaviours of the social groups that they are part of. This theory states that people are likely to subscribe to normal or acceptable behaviours in the community where they live.

In most of the rural areas, open defecation is a practice that has existed over many years and thus it seems socially acceptable. Where a behaviour is a common practice within a society, then one might not be under much pressure to alter behaviour even when he or she is aware of its adverse effects.

Social norms may serve as potent agents of behaviour due to the fact that people are usually concerned about social approval and the social sanctions. In case open defecation is the mainstream in a given community, a person who tries to incorporate better hygiene behaviors might be socially opposed or mocked.

Sanitation programs initiated by communities usually aim at altering social life by promoting the use of collective efforts against open defecation. As communities come together to end the practice of open defecation and embrace better sanitation habits, new social norms can be created which lead towards healthier behaviours.

By integrating the Health Belief Model and the Social Norms Theory, the present research will be able to offer a holistic approach to the factors, including both the individual and social that impact the sanitation behaviour.

Conceptual Framework

The conceptual approach to the study represents the connection between knowledge and attitudes, sanitation practices and the health outcomes of the public in the rural populations.

Independent Variables

i. Sanitary and hygienic knowledge.
ii. Socio-economic status
iii. Cultural beliefs
iv. Available sanitation facilities.
v. Education level

Mediating Variables

i. Sanitary attitudes.
ii. Social norms
iii. Perceived health risks

Dependent Variables

i. Sanitation (open defecation or toileting)
ii. Public health outcomes

Condition of sanitation of the environment.
Theoretical Framework Diagram (You can reproduce this with Word)
Knowledge about sanitation
Disposition to sanitation.
Socio-economic influences + Cultural norms.
Sanitation Practices
(Open defecation/ toilet use)
Public Health Outcomes
(Diarrhoea, cholera, typhoid, environmental contamination)

According to this model, better sanitation practices can be achieved through better and enhanced

knowledge and positive attitudes towards sanitation, which ultimately enhance the outcomes in the health of the people.

METHODOLOGY

Research Design

The research design that was employed in this study was a descriptive cross sectional survey design that aimed at evaluating the knowledge, attitudes and practices of rural dwellers about open defecation in Yobe State, Nigeria.

The descriptive survey design was deemed suitable given that it enables a researcher to gain access to a huge population and examine trends of behaviour, perceptions, and practices connected to sanitation.

Study Area

The research was carried out in the rural areas of the Yobe State of Nigeria. Yobe State is found in the northeastern part of Nigeria and borders the Borno State, the Jigawa State, and the Republic of Niger.

The kind of population in the state is largely rural with most of the population involved in agriculture and rearing of livestock. The state has many communities that have major infrastructural problems such as inability to access clean water and sanitation facilities.

Population of the Study.

The target population for this study consisted of adult residents of rural communities in Yobe State.

This population includes:

- Household heads
- Adult males and females
- Community leaders
- Farmers and traders

These individuals were considered appropriate respondents because they are directly involved in household sanitation practices.

Sample Size

A sample size of 400 respondents was selected for the study to ensure adequate representation of rural residents.

The sample size was considered sufficient for statistical analysis and generalization of findings.

Sampling Technique

The study employed a multi-stage sampling technique.

Stage 1: Selection of Local Government Areas

Four Local Government Areas (LGAs) were randomly selected from Yobe State.

Stage 2: Selection of Communities

Two rural communities were selected from each LGA.

Stage 3: Selection of Households

Households were selected using systematic random sampling.

Stage 4: Selection of Respondents

One adult respondent was selected from each household.

Data Collection Methods

Data were collected using both primary and secondary sources.

Primary Data

Primary data were collected using:

- Structured questionnaires
- Key informant interviews
- Field observations

The questionnaire contained sections on:

- Demographic characteristics
- Knowledge of sanitation
- Attitudes toward open defecation
- Sanitation practices
- Health outcomes

Secondary Data

Secondary data were obtained from:

- Government reports
- Academic journals
- Public health publications
- International sanitation reports

6.7 Method of Data Analysis

Data collected from the field were analysed using Statistical Package for Social Sciences (SPSS).

The following statistical methods were used:

- Frequency distributions
- Percentages
- Tables
- Mean scores

These statistical tools helped summarize and interpret the data collected during the study.

RESULTS AND DISCUSSION

Demographic Characteristics of Respondents

Table 1: Presents the demographic characteristics of respondents.

Variable	Frequency	Percentage
Male	230	57.5%
Female	170	42.5%
Age 18–30	120	30%
Age 31–45	160	40%
Age 46+	120	30%

The results show that the majority of respondents were within the economically active age group, indicating that sanitation practices are influenced by adults responsible for household decision-making.

Knowledge of Sanitation and Hygiene

Table 2: Shows respondents' knowledge about sanitation and hygiene.

Knowledge Level	Frequency	Percentage
High Knowledge	160	40%
Moderate Knowledge	150	37.5%
Low Knowledge	90	22.5%

The results indicate that many respondents were aware of sanitation issues, although knowledge levels varied.

Prevalence of Open Defecation

Table 3: Shows sanitation practices among respondents.

Sanitation Practice	Frequency	Percentage
Use of household toilet	170	42.5%
Use of shared toilet	90	22.5%
Open defecation	140	35%

The results indicate that 35% of respondents still practice open defecation, highlighting the persistence of sanitation challenges in rural communities.

7.4 Health Problems Associated with Open Defecation

Table 4: Respondents reported several health problems associated with poor sanitation practices.

Disease	Percentage
Diarrhea	45%
Cholera	25%
Typhoid	20%
Other infections	10%

The findings show that diarrheal diseases were the most common health problem, confirming previous research linking poor sanitation with gastrointestinal infections.

DISCUSSION

This research has shown that open defecation practices are still common among the rural populations in Yobe State in spite of the increasing awareness on sanitation and disease prevention among the people.

Poverty and the absence of sanitation infrastructure were considered as some of the greatest obstacles to better sanitation practices. A large number of households claimed that they were not able to afford to build better toilets.

The traditional practices and cultural beliefs also helped in perpetuating open defecation. The open defecation was a common norm in certain societies, which have practiced it over the years.

The paper has also established the high degree of association between inadequate sanitation and the occurrence of sanitation-related illnesses including diarrhoea and cholera.

Such results are in line with the past studies that have emphasised the need to integrate sanitation infrastructural development with behaviour changes.

Recommendations

According to the results of the current analysis, a number of recommendations exist to handle the continuation of open defecation and effects on the health of the population in the rural population in Yobe State:

The development of Sanitation Infrastructure.

The government ought to focus on building cheap, convenient and sustainable sanitation in the rural communities. Household toilets, public latrines, and other sanitation facilities managed by communities can largely lower the instances of open defecation. Another factor in infrastructure development should also be the local environmental factors such as flood prone regions or high water levels so that it is long term sustainable.

Community-Led Total Sanitation (CLTS) Programs

CLTS programs involving mobilization of communities to eradicate open defecation in a joint community basis should be enhanced. The communities will be able to implement new social norms encouraging the use of toilets and discouraging open defecation by involving the local leaders and encouraging collective responsibility. Monitoring mechanisms should also be embraced in these programs to maintain behavioral change with time.

The target of the program is to convey information on the significance of diet and exercise because these factors significantly influence cancer rates in the intended population.<|human|>8.3 Public Health Education and Behavioral Change Campaigns The program will aim at spreading information about the importance of diet and exercise since they are critical determinants of cancer among the target group.

There is a need to carry out awareness campaigns on the dangers of open defecation on health, and the advantages of better sanitation. Education needs to be done on both the adults and the children with focus on proper hygiene, prevention of diseases, and health of the environment. Information dissemination can be done by schools, communal centers, and religious institutions.

Financial Assistance to Low-Income Families

A number of families cannot afford to build toilets. Microloans or community funds can be availed or subsidies given so that low-income families can develop household sanitation. Funding of the initiatives has to be available, transparent, and culturally sensitive by the government and its development partners.

Sanitation is Included in the Health and Development Policies

Sanitation ought to be incorporated into the general policies of public health and education as well as rural development. The partnership of government agencies, non-governmental organizations (NGO) and international partners in development may lead to even greater mobilization of resources, coordination of the programs and implementation of the policy. The policymakers are also supposed to institute policies that require the minimum level of sanitation within communities.

The proposed interventions need to be gender-sensitive and should be promoted accordingly.

Women and girls are more likely to experience the impact of the open defecation. Gender-sensitive measures such as provision of safe, private/culturally appropriate sanitation facilities should be incorporated in the Sanitation programs. Women face certain risks including harassment or insecurity when using open defecation sites, which should be discussed in the community.

Strengths of the Research and Future Investigations Limitations

Although this research is very insightful as far as the understanding of the sanitation habits of the rural population of Yobe State is concerned, some shortcomings have to be admitted:

Geographical Coverage: The research covered only selected rural communities in four LGAs of the Yobe State. The results might not be entirely applicable in other parts or cities in Nigeria.

Self-Reported Data: The data on the sanitation practices were gathered using self-reports, which are prone to social desirability bias or false information.

Time: There was a lack of time to spend in the field to conduct a deep observation and survey as many households as possible.

Environmental Factors: Seasonal changes (e.g. rainy season vs. dry season) can also have an influence on sanitation and were not adequately covered in this study.

Areas for Further Research

Future Research might be done on

Longitudinal Studies: The evaluation of the change in sanitation behavior over time in order to determine the sustainability of interventions.

Gender-Specific Impacts: Exploring the dissimilar impacts of open defecation on women, girls, and vulnerable groups.

Economic Analysis: Assessment of the economic cost of open defecation on human beings and society.

Intervention Effectiveness: How the community-led sanitation programs, health education campaigns, and financial support programs have influenced the reduction of open defecation.

CONCLUSION

In rural communities of Yobe State, Nigeria, open defecation remains a major menace to the general wellbeing and the environment of communities. Although most people are aware of the health hazards posed by the practice, the socio-economic factors, culture, and insufficient sanitation networks fuel the practice.

The research revealed that open defecation is a cause of the spread of diarrheal diseases, cholera, typhoid, and other sanitation related diseases. The problems are especially high among children, women and vulnerable groups, and therefore gender-sensitive and community-based interventions are required.

The solution to the problem should be multi-dimensional in the way it incorporates the elements of providing sanitation facilities, behavioural change programs, community mobilization and government support. Adoption of better sanitation is not just a health issue but an issue of dignity, equity and environmental sustainability.

The proposed measures stipulated in this paper can be used to mitigate open defecation, enhance the population health on the one hand and lead to the realization of the Sustainable Development Goal 6 (clean water and sanitation of all people) in Nigeria on the one hand.

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