

Research Paper

Rethinking community-led total sanitation for eradicating open defecation in rural Ebonyi state communities, Nigeria: practice considerations for social work practitioners and educators

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ABSTRACT

Nigeria is ranked number two in the world with the highest prevalence of open defecation (OD) despite the adoption of community-led total sanitation (CLTS) since 2007. Using some CLTS-triggered communities in Ebonyi State, this study investigated the awareness of CLTS, OD status, and its drivers as well as social workers' involvement in environmental sustainability. Study data generated from primary surveys included the socio-demographic characteristics of the study population and measurable behavioral elements of the SaniFOAM framework. Results of the statistical analyses show that more than 79% of the respondents were aware of CLTS, yet OD prevalence was 84.8%. While being married (odds ratio (OR): 0.036), being a civil servant (OR: 0.109), and having at least secondary education (OR: 0.119) were associated with lower odds of OD, whereas dislike for trekking (OR: 4.322), absence of laws (OR: 5.380), sanctions (OR: 4.715), and other SaniFOAM variables were associated with increased odds of OD. The results suggest that behavioral change toward OD under CLTS, with its focus on community mobilization for self-awareness and self-assessment for eliminating OD, may be a mirage without stricter approaches, laws, and sanctions for behavioral change. The domiciliation of these within grassroot governments and social workers' involvement in sanitation promotion are suggested.

Key words: community-led total sanitation, open defecation, SaniFOAM, SDG, social work

HIGHLIGHTS

- Re-evaluation of CLTS in rural areas.
- Sanitation behavior patterns and predisposing factors to open defecation practice.
- The place of social work and environment health.
- Need for eco-centric curricula development in social work education.

INTRODUCTION

The ambitious goal of universal access to improved sanitation by 2030, and the UN General Assembly resolution that established for the first time water and sanitation as two separate rights, are international plans for the eradication of open defecation (OD) and improved hygiene across the nations (Vernon & Bongartz 2017). Regmi (2017) noted that sanitation is 'not a cost of wealth, but rather a safeguard, promotion, and preservation of community health'. According to a 2015 WHO/UNICEF survey, 31% of the then-developing-country population of 4.1 billion were open defecators in 1990, and 16% of the then-developing-country population of 6 billion were open defecators in 2015. OD has both acute and chronic public health consequences, and it is responsible for a high burden of disease and a large number of sanitation-related morbidity and mortality among children under the age of 5 years in low- and middle-income countries (Mara 2017; Gayawan *et al.* 2023). Diarrhea, one of the leading causes of death among children under the age of 5 years in Africa, is primarily related to

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inadequate sanitation and hygiene (Galan *et al.* 2013; Sara & Graham 2014). Sanitation has an effect on a variety of inter-connected systems (Musembi & Musyoki 2016) and OD causes stunted growth in children (Adedigba 2019), contributes to fecally transmitted infections (FTIs), poverty, and malnutrition among others (Vernon & Bongartz 2017; Gayawan *et al.* 2023). Poor sanitation has been linked to psychological stress, and may make women more vulnerable to violence related to water, sanitation, and hygiene (WASH) (House & Cavill 2015; Sahoo *et al.* 2015; Steinmann *et al.* 2015). OD practice also causes massive fecal pollution of the natural ecosystem and as a consequence, defecators may be continually exposed to fecal bacteria and pathogens (Gayawan *et al.* 2023).

The community-led total sanitation (CLTS), one of the approaches of total sanitation approach (TSA) is arguably among the most successful sanitation approaches in the last decade. Since its invention in Bangladesh by Kamal Kar and the Village Education Resource Centre (VERC) in 2000, the CLTS has been useful in evaluating a historically subsidized sanitation program (Hanchett 2017; Vernon & Bongartz 2017). In terms of results and effects, the CLTS system still stands out among the various OD studies (Beyene 2017; Coombes 2017; Munkhondia *et al.* 2017; Bhar *et al.* 2017; Musyoki 2017; Myers 2017; Robinson & Gnilo 2017; Thomas 2017; Wamera 2017). The CLTS works with an entire community to recognize the negative effects of poor sanitation, particularly OD, and empowers them to find solutions together. It is designed to work by altering social norms and raising mutual awareness of the private and public costs and benefits of sanitation, with the goal of increasing the acceptance of better sanitation practices (Abramovsky *et al.* 2016). Since it became operational, a number of sub-Saharan African countries including Ethiopia, Ghana, Guinea, Kenya, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Sierra Leone, Togo, Zambia, and Nigeria have included CLTS in their national policies (Galan *et al.* 2013).

Nigeria, like the majority of Sub-Saharan African and developing countries, is plagued by rural poverty, neglect, and lack of growth. The practice of OD, with its attendant public health implications, is most prevalent in the rural space. According to Galan *et al.* (2013), many of the OD activities, such as defecating in fields, woods, trees, water sources, or other open spaces, occur in low-income countries' rural areas. It is reported that the overall number of people practicing OD has increased by 33 million over the period due to population growth (Galan *et al.* 2013). Nigeria, with an estimated population of over 180 million people in 2015, had a 25% OD rate, or about 45 million people (Abramovsky *et al.* 2016). In absolute terms, this means that about 48 million Nigerians defecate in the open, based on the country's current population estimate of 200 million. Adedigba (2019) reported that UNICEF recently ranked Nigeria second among countries with a high prevalence of OD in the world. The United Nations projected that by the year 2050 when Nigeria's population will be 400 million, one in every 25 people around the world will reside in Nigeria (United Nations 2019). Nigeria officially adopted CLTS in 2007 as an accepted solution in the National Strategy for scaling up sanitation and hygiene with the aim of reducing by half OD rates by 2015. Over £120 million was channeled into the country through the Sanitation, Hygiene, and Water in Nigeria (SHAWN) programs, with the aim of providing over 7 million beneficiaries with access to appropriate and safe sanitation facilities, hygiene education activities, and a sustainable safe and reliable water supply to reduce public health risks and disease transmission (Abramovsky *et al.* 2016). In 2018, Nigeria declared a state of emergency on WASH as a means of galvanizing support to address the problems (Adedigba 2019). Despite all the efforts made, progress in expanding sanitation coverage has been sluggish and/or unproductive, and OD practice still on the increase.

Social work practice is integral to achieving the UN sustainable development goals (SDGs) especially as it concerns the improvement of physical and human environments and the promotion of social and environmental justice (Schmitz *et al.* 2012). Environmental or green social work practices in different parts of the world aim at advocating and designing intervention programs that promote environmental health and mitigate the impact of climate change (Androff *et al.* 2017; Bowles *et al.* 2018). In addition, it has been argued in pieces of literature that since the focus of social work practice covers human rights, social justice, and equity, it behoves the profession to stimulate discussions and actions that sustain environmental rights and ecological justice (Schmitz *et al.* 2012; Crawford *et al.* 2015; Melekis & Woodhouse 2015). Nigeria has its own share of the adverse impact of climate change, environmental degradation, and pollution; hence, there are innumerable cases of desert encroachments, floods, erosions, windstorms, and other environmental hazards. Education is a tool for training and retraining professionals, as well as a medium for the translation of theory into practice, and the university is the key to molding environmental attitudes and promoting environmental sustainability (Ibáñez *et al.* 2020). This creates the need to expand social work curricula in Nigeria to accommodate all emerging social issues including environmental social work and climate change imperative (Melekis & Woodhouse 2015; Androff *et al.* 2017). Some schools of social work have made efforts to integrate the study of environmental social work as part of their curricula; however, much is

yet to be done. Moreover, since the environment – social or physical is crucial in social work practice, social work educators and practitioners should be ethically responsible for promoting healthy interrelationships between the social and natural environments (Boetto & Bell 2015; Crawford *et al.* 2015).

With the increasing prevalence of OD in rural Nigeria, the slow pace of progress in combating it, and the multitude of public health implications that it brings, it's important to question the acceptance and usability of CLTS initiatives for mitigating OD practice in rural communities. The roles of social work practitioners and educators are also interrogated to ascertain how they can promote community awareness as well as environmental education to help curtail OD practice and enhance knowledge and practice of CLTS in communities. Some studies on CLTS have reported varying degrees of success (Zuin *et al.* 2019; Radin *et al.* 2020); however, to our knowledge no study has attempted to question the usefulness of CLTS in rural communities. Therefore, this study aims to interrogate the applicability of CLTS as a tool for eradication OD in rural Nigerian communities and to draw attention to the roles of social workers in sanitation and environmental sustainability.

METHODS

Population and sampling

According to the national roadmap on OD eradication, the South-East region of the country had the highest prevalence of diarrhea (5.7%). This suggests that sanitation issues are more predominant in the region. Two of the region's five States, Enugu and Ebonyi, were also listed as having OD prevalence higher than the national average. While Enugu is largely urban, Ebonyi on the other hand is predominantly rural. As rural areas have been widely acknowledged to have a higher prevalence of OD, Ebonyi State was selected for this study. The choice of Ebonyi was further predicated on the fact that it has benefited from various WASH interventions from international development agencies and NGOs like UNICEF, UNDP, and WaterAid, and most of its rural communities are on the list of CLTS-triggered communities. The State has 13 local government areas (LGAs) in three senatorial districts. One LGA was purposively selected from each of the senatorial districts and two rural communities were further selected from each LGA as the study sample. The communities are Agbaja and Igbeagu in Izzi LGA, Ndufu-Alike and Noyo-Alike in Ikwo LGA, and Unwana and Ozizza in Afikpo North LGA, respectively.

Data types and collection methods

Primary data collected via a structured questionnaire were used for this study. The questionnaire contained items on the socio-demographic characteristics of the study population and the practice of OD in the selected communities. The SaniFOAM framework was employed in constructing the items on OD and CLTS in the questionnaire. SaniFOAM is a conceptual framework for deepening the understanding of sanitation behaviors using four categories of behavior determinants: focus, opportunity, ability, and motivation (FOAM) (Devine 2009). Such behaviors include ceasing to defecate in the open, building a sanitation facility, improving available sanitation facilities, properly maintaining existing facilities, and correctly disposing of children's excreta. It is also a tool for designing, monitoring, and evaluating sanitation interventions (Sara & Graham 2014). The focus in the framework is on target behavior that needs to be changed and the socio-demographic characteristics of the target population that predispose them to certain sanitation practices. Opportunity refers to institutional and structural factors influencing sanitation behavior while Ability includes knowledge and social support. Determinants that emanate from beliefs, attitudes, and perceptions as well as emotional and social drivers like the fear of health implications of sanitation practices are implied in Motivation (Devine 2009; Coombes & Devine 2010; O'Connell 2014; Sara & Graham 2014). The questionnaire was administered to resident adult members of 600 households in the selected communities. The study participants provided informed consent and the study was conducted under the University of Nigeria ethical approval number UNN/EC/010-SC/4003-/MAR-06.

Data analysis

The datasets were coded appropriately and analyzed at univariate, bivariate, and multivariate levels. Percentages and frequency distribution were used for the descriptive analysis of respondents' socio-demographic characteristics, their levels of awareness of CLTS programs, and their defecation practices. The χ^2 test was employed to establish associations between the defecation practices and FOAM elements of the datasets while binary regression analysis was carried out to determine the relationship between the FOAM elements and the practice of OD. The dependent variable in the regression model

was the practice of OD with its binary outcomes of Yes or No to defecating in the open. The socio-demographic characteristics (target population in the SaniFOAM framework) and other FOAM elements constituted the independent variables. They were also coded in binary form of Yes/No. Statistical analyses were carried out using SPSS and levels of significance for all analyses were set at a minimum of $P < 0.05$.

RESULTS

Socio-demographic characteristics of respondents and awareness of CLTS

The gender distribution of the respondents was almost the same with women being slightly more (50.5%). The sample contained 40.8% married respondents, 33.5% civil servants, and nearly 34% university degree holders. As illustrated in Table 1, the respondents were also evenly distributed across the three LGAs. In all, 79.3% of the respondents were aware of the CLTS program for eradicating OD in their various communities with respondents from Afikpo North having the highest level of awareness (88.6%). More males than females were also aware of the CLTS program just as respondents employed in the civil service recorded the highest level of awareness (92.0%). The level of awareness was lowest among uneducated respondents and those who were not educated beyond primary school. The results of the χ^2 test indicate that the following socio-demographic characteristics of the respondents; marital status, LGA of residence, occupation, and level of education, were significantly associated with awareness of CLTS among the study sample ($P < 0.001$). Sex was not significant (Table 1).

Table 1 | Characteristics, awareness, and bivariate association of respondents

Variable	Respondents (%)	Awareness	F-value
Sex			1.655
Male	49.5	81.5	
Female	50.5	77.2	
Marital status*			18.600**
Single	45.0	84.1	
Married	40.8	71.8	
Widowed	5.5	78.8	
Divorced	5.3	90.6	
Separated	2.5	100.0	
LGA			18.793**
Afikpo North	33.7	88.6	
Ikwo	33.0	71.2	
Izzi	33.3	78.0	
Occupation*			70.013**
Civil Servants	33.5	92.0	
Trading	29.5	73.4	
Farming	14.7	51.1	
Others	22.0	86.4	
Education			140.327**
No formal education	1.8	36.4	
Primary school	9.7	31.0	
WAEC/GCE	27.7	71.7	
Diploma/NCE	27.2	86.5	
B. Sc/HND	33.7	96.0	

*Did not add up to 100 due to some missing values.

**Significant at $P < 0.001$.

Dimensions of OD and multivariate analysis

In spite of widespread awareness, with nearly 80% of the respondents knowing about CLTS for the eradication of OD in their communities, 84.8% of the sample engaged in OD. Of these, 51.1% were females, 44.4% were married, 36.9% were from Izzi LGA, 35.5% were civil servants and 31.6% had a university degree (Table 2). Nearly 82% of those who defecated in the open did so because they dislike trekking long distances to use available latrines in their communities, 81.7 defecated in the open because they claimed there was no law prohibiting them from doing so while 74.5% did due to a lack of central leadership to drive the CLTS programs in their communities. The absence of social support to encourage ownership of latrines (93.5%) was the predominant reason fueling the respondents' ability to defecate in the open just as the lack of resources to build latrines (94.5%) was the predominant motivational factor.

The bivariate analysis of the responses shows that the Focus elements of marital status, LGA of residence, occupation, education, and the dislike for trekking long distances to use latrines were statistically significant in their associations with the prevalence of OD. All the elements that measure opportunity and motivation were also statistically significant while the lack of social support for latrine ownership was the only Ability element that was not statistically significant (Table 2). The result of the regression analysis on the SaniFOAM elements as determinants of the practice of OD however identifies aspects of the target population and other elements that were significant predictors of OD. It further shows that not all the elements with significant association in the bivariate analysis were significant predictors. The result shows that being married, a civil servant, and having primary or secondary education significantly lowers the likelihood of defecating in the open. Residents of Afikpo LGA were almost nine times more likely to defecate in the open while odds were between four and five times higher for respondents who disliked trekking long distances, where OD attracted no sanctions, and where there were no laws prohibiting OD (Table 2). Again, the result shows that trekking long distance to use facility, lack of central leadership to enforce OD eradication increases the likelihood of defecating in the open.

DISCUSSION

The level of awareness of the CLTS programs for the eradication of OD in the study area was found to be quite high. Across the various dimensions of the respondents' socio-demographic characteristics, none recorded an awareness level of less than 70% except for farmers and respondents with no primary education. The awareness was absolute among respondents who had a 'separated' marital status, and almost absolute among those with a university education and civil servants. Yet, the prevalence of OD among the population was nearly 85% with civil servants and respondents with university education accounting for the largest shares of open defecators in the occupational and educational categorization. One would have expected both categories of respondents to champion the drive to ODF by setting examples for other less exposed and less educated community members. This implies that the practice of OD goes beyond just creating an awareness of the public health implications of the practice and the need to improve on the adoption of latrines in the communities as enshrined in the CLTS programs. The finding rather suggests that the practice is more about beliefs, norms, attitudes, and behavior as concluded in studies by Yogananth & Bhatnagar (2018), Osumanu *et al.* (2019) and Bhatt *et al.* (2019).

Other than sex, all other aspects of the target population measuring sanitation focus were found to be significantly associated with OD. These are marital status, location, occupation, and education. These variables have also been found to influence OD in other studies (Abubakar 2018; Gebremedhin *et al.* 2018; Busienei *et al.* 2019; Njuguna 2019; Osumanu *et al.* 2019). Beyond the association, however, not all of them were significant predictors of OD in the study communities. Being married, educational attainment beyond primary school, and being employed in the civil service were found to decrease the odds of defecating in the open. This is despite the fact that respondents with these statuses were in the majority in the marital status, educational and occupational categorization of the sample's socio-demographic characteristics. This implies that the proportions notwithstanding, the statuses matter significantly in lowering the prevalence of OD in the study communities.

The behavioral and attitudinal factors, measured in this study to reflect elements of the SaniFOAM framework, that predicted the prevalence of OD in the study area were the dislike for trekking long distances to use latrines, absence of a law prohibiting OD in the communities, the practice of OD attracting sanctions, lack of organized action on sanitation, lack of knowledge of CLTS, lack of space for the construction of latrines in compounds, lack of financial resources to build latrines and being ashamed to defecate in the open. All of the factors significantly increased the odds of defecating in the open. Awoke & Mucho (2013), among several studies, also found that distance to latrines influenced OD. While the attitude and behaviors

Table 2 | Dimensions and predictors of OD

SanIFOAM elements	Open defecator (%)	F-value	Odds ratio
Sex		0.452	
Male	48.9		1.480
Female	51.1		RC
Marital status		39.431**	
Single	40.3		0.195
Married	44.4		0.036*
Widowed	6.5		0.021
Divorced	6.3		0.018
Separated	2.4		RC
LGA		72.563**	
Afikpo North	26.7		8.772**
Ikwo	36.3		1.170
Izzi	36.9		RC
Occupation		40.655**	
Civil Servants	35.5		0.109*
Trading	29.6		2.236
Farming	17.0		0.025
Others	17.9		RC
Education		19.163**	
No formal education	1.4		26.751
Primary	11.4		0.017
Secondary	28.5		0.119*
Diploma/NCE	27.1		0.168*
B.Sc/HND	31.6		RC
Target behavior			
Prefer to defecate in the open	41.1	0.072	0.933
Dislike trekking to use facility	81.8	63.969**	4.322**
Opportunity			
No central leadership	74.5	25.302**	2.052
CLTS effective and enforced	24.4	11.654**	1.854
Non-participation in CLTS attracts sanctions	31.8	16.416**	0.862
No law prohibiting OD	81.7	34.419**	5.380**
OD attracts sanctions	25.8	12.459**	4.715**
No organized action on sanitation	71.3	34.945**	2.442*
Ability			
No knowledge of CLTS	46.8	35.797**	3.869*
Not bothered about CLTS	66.7	28.181**	1.724
No social support for latrine ownership	93.5	0.181	0.993
Lack of space for latrine	50.5	9.487**	4.109**
Motivation			
OD normal and common	86.1	58.973**	0.958
Ashamed at OD	64.4	8.386*	3.250**

(Continued.)

Table 2 | Continued

SaniFOAM elements	Open defecator (%)	F-value	Odds ratio
OD causes health issues	73.2	3.476*	0.916
Lack of resources to build latrine	94.5	46.277**	4.582**

*Significant at $P < 0.05$.

**Significant at $P < 0.001$.

may, however, vary from place to place, and may influence OD outcomes in different ways in different places, they are largely associated with rural remoteness (O'Reilly *et al.* 2017; Gebremariam & Tsehaye 2019; Njuguna 2019).

With no aspect of the SaniFOAM framework employed in this study significantly contributing to lowering the odds of defecating in the open in the study area, even after over a decade of adopting the CLTS in Nigeria, the CLTS program may not be the way to go for eradicating OD in Nigeria after all. Elsewhere, the findings on the effectiveness of CLTS in tackling OD have been mixed between increased latrine uptake and increased prevalence of OD in spite of CLTS (Barnard *et al.* 2013; Crocker *et al.* 2017; Munkhondia *et al.* 2017; Belachew *et al.* 2018; Venkataramanan *et al.* 2018; Harter *et al.* 2019). Crocker *et al.* (2017) concluded that with the mixed findings, CLTS may not be appropriate in all settings. The decline of Nigeria to the number two country in the OD ranking further confirms that at the national level, the CLTS has not effectively addressed the OD scourge. The national ranking is an aggregation of results from various communities like the ones studied in this work. The ineffectiveness of CLTS may be further attributed to its governance.

Nigeria operates a three-tiered governance structure of federal, state, and local governments with the federal government at the top. The CLTS is managed at the federal level with an expectation that States and LGAs, which are closer to the communities, will provide funding and the necessary supervision for behavioral change expected to drive OD eradication. Many States in Nigeria are running deficit budgets and are not disposed to funding 'federal projects' while the LGAs have become an appendage of the State governments because the States control their finances. This disconnect, a consequence of the decentralization of governance in the provision of public goods and services (Adewoyin *et al.* 2020), leaves the CLTS largely unsupervised and unfunded. This much is further reflected in the study results which show that the 'absence' of laws prohibiting OD, a lack of sanctions for OD, and a lack of resources to build latrines in the communities were reasons OD persisted in the study communities. This position follows from the respondents' lack of awareness of such laws and sanctions because they only exist in policy documents at the first and second tiers of government and not at the community level where they are resident. Therefore, CLTS can be more effective if used in conjunction with extant localized laws and ordinances. Again, resources to build public latrines are deemed absent because the states had not provided any funding for such purposes at the local level.

Practice considerations for social work practice and education in Nigeria

Social work practice cuts across all spheres of human lives; that is to say, whatever affects the healthy functioning of humans and society anywhere is of interest to social workers, hence, environment and social work are closely connected (Schmitz *et al.* 2012). At the turn of the century, climate and environmental dynamics have created enormous challenges and existential danger to the human race all over the world. Social work is a profession that evolves and strives to advance itself in meeting society's immediate and emerging problems. As the human population is growing daily, that is also how the problems that were hitherto not there are emerging, thereby putting pressure on our collective existence. Aside from the practice of OD that is common in many Nigerian communities, the environmental behavior of the people is poor owing to a lack of knowledge of the impact of the environment on people's well-being. Achieving environmental sustainability and the attainment of the SDG on the environment requires multi-sectorial stakeholders' collaboration of which social work is key (Schmitz *et al.* 2012; Rambaree 2020). All around the world, social work educators and practitioners have been committed to the promotion of environmental health via education and professional engagement as part of their ethical responsibility of achieving social justice and cohesion (Melekis & Woodhouse 2015; Krings *et al.* 2020). In pedagogical development, Rambaree (2020), argued that to achieve the implementation of a total sustainable development within the spectrum of social work curriculum, a transformative and emancipatory pedagogy for teaching and learning environmental social work is important. In Nigeria, some universities that offer social work training at both postgraduate and undergraduate levels do not have courses on environmental social work. For example, the University of Nigeria and the University of Benin are among the few universities

in Nigeria that have a full department of social work accredited to offer postgraduate and undergraduate courses in social work, yet there is no single course whether core, elective, or ancillary that focuses on social work and the environment. Environmental social work should be considered a major subject in Nigerian universities, and in situations where graduates of social work were not taught social work roles in environmental sustainability, environmental awareness can be part of continuing education or in-service training to equip them with appropriate knowledge for the achievement of SDG on the environment. Nigeria has various dimensions of environmental challenges that impact adversely on the population, and as interventionists, social work professionals and educators in Nigeria should promote environmental health and develop eco-centric education and training manuals. The social work profession has the global goal of promoting social justice for all, and that transcends to both protecting human and environmental rights. The results of this study have huge implications for social workers in Nigeria especially as it concerns the eradication of OD and other environmental hazards that affect rural dwellers. First, social workers have the roles of environmental advocacy and behavior change that promote positive outcomes. The results indicated that respondents possess a significant level of knowledge of the CLTS, however, OD practice still persists despite that. The gap can be bridged through the social workers' role in behavior change intervention. SaniFOAM as a framework is an intervention designed to achieve behavior change among other indicators. One may be aware of something without taking any steps toward its practice as the study results indicated with respect to the uptake of CLTS and OD practice. This may be a result of the inability to internalize the knowledge and opportunities that allow for the adoption of such behavior. Therefore, social workers through community and macro-level advocacy can create an intervention that promotes behavior change; this could be linkages to government grants that help community members to own their toilets. Another important role social workers can play in encouraging sanitation in rural communities is social marketing for the acceptance and utilization of the CLTS as a sanitation mechanism for the eradication of OD practice in rural communities. The practice of OD even with some level of awareness of CLTS among the study population may be a result of poor marketing of the innovative approach. Therefore, in this context, social workers can play a role in social marketing of the sanitation approaches to make it more acceptable to the rural dwellers. These roles of social workers are imperative as the effect of OD and poor sanitation mostly affect the vulnerable and oppressed rural dwellers.

CONCLUSION

The prevalence of OD in Nigerian communities is not improving in spite of the adoption of CLTS programs in the country since 2007. Instead, it appears to be getting worse when the number of open defecators is analyzed in absolute terms. Evidence from this study confirms that widespread awareness of the CLTS in communities where they were adopted notwithstanding, the practice of OD is still very high in the communities. This suggests a rethink of the current approach to eradicating OD in rural Nigeria. If, like [Bhatt *et al.* \(2019\)](#) opined, OD is a medium for socializing, a habit, and enjoyable outdoor activity, the CLTS which expects defecators and communities to do a self-appraisal and based on the appraisal and some external triggering, resolve to end OD in their own best interests, is not likely to be any effective. Rather, a more drastic approach that amplifies sanctions for certain behavior and attitudes might be necessary. Such an approach should also be domiciled with the arms of government that are closest to the grassroots, health professionals, and social workers for monitoring and evaluation. Also imperative is the place of education and the process of training environmental social workers who will be equipped with the requisite knowledge and skills to provide appropriate intervention for achieving OD-free communities and the SDG in rural localities in Nigeria.

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DATA AVAILABILITY STATEMENT

All relevant data are included in the paper or its Supplementary Information.

CONFLICT OF INTEREST

The authors declare there is no conflict.

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