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Social Marketing: Using the Theory of Planned Behaviour to Predict Open Defecation Free Behaviour Among Households in Ghana

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Abstract

Background: Despite global efforts to combat the menace of open defecation, the phenomenon persists, particularly in developing nations. It is estimated that about 14% of Sub-Saharan Africa's population still practice open defecation.
Focus: The study sought to examine the behavioral and psychological mechanisms that influence attitudes toward open-defecation-free behavior in Ghana by applying a behavior change theory.
Key Hypotheses: The following hypotheses were formulated and tested by this study: households' attitude towards open defecation-free has a significant positive relationship with the actual open defecation-free behavior, household's subjective norms towards open defecation-free have a significant positive relationship with their actual open defecation-free behavior and households' perceived behavioral control over open defecation free has a significant positive relationship with their actual open defecation free behavior.
Methods: A cross-sectional survey was conducted involving 550 respondents. Data were analyzed using the structural equation modeling technique.
Results: All three variables of the theory of planned behavior were found to have a positive significant influence on Ghanaian households' actual open defecation-free behaviors. Demographics such as income, educational level, and availability of latrines were found to moderate the relationships between subjective norms, perceived behavioral control, and households' actual open defecation behavior.
Importance to Social Marketing Field: The study extends the current literature on social marketing by demonstrating that the theory of planned behavior could be used to predict people's attitudes toward open-defecation-free behavior. Though the theory of planned behavior has been empirically proven as a good predictor of behavior, by moderating its relationship with open

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defecation-free behavior with demographic variables our model fleshes out more nuances of the theory, thereby contributing to the development of a social marketing theory.
Recommendations for Research or Practice: This study employed a cross-sectional survey; hence it may presume static relationships among the constructs which can be cured by a future longitudinal study that could explain the pattern of behavior change. The study recommends that government facilitates the provision of latrines for households by providing financial assistance to those who cannot afford the construction of latrines. A social marketing campaign should also be adopted to encourage the use of latrines.

Keywords
open defecation, social marketing, theory of planned behavior, attitude, Ghana

Introduction

Despite global efforts to combat the menace of open defecation, the phenomenon persists, particularly in developing nations (Adlakha, et al., 2022; Adzawla et al., 2020; Kevin Alom et al., 2020; Osumanu et al., 2019). Open defecation is defined as the indiscriminate disposal of human fecal matter in open places such as bushes, forests, fields, beaches, roadsides, and water bodies (WHO/UNICEF, 2017). While some regions of the developing world are experiencing a reduction in the rate of open defecation, others still record high rates (Ntaro et al., 2022). For instance, while only 2% of the population in Latin America and the Caribbean regions practice open defecation, the practice is still as high as 14% in Sub-Saharan Africa (WHO & UNICEF, 2017). South Asia has witnessed a decrease in open defecation as the rate dropped from 65% in 1990 to 34% in 2018 (UNICEF, 2018). The figures may be declining but South Asia still accounts for more than two-thirds (558 million) of the world's population that practice open defecation (UNICEF, 2018). Based on the current rate of decline it is estimated that more than 5% of the world's population will still practice open defecation by 2030 (Adzawla et al., 2020). Consequently, about nine million people die yearly due to unsafe sanitary conditions and environmental pollution (Landrigan et al., 2017). Hence, the prospect of achieving an open defecation-free society remains a long-term aspiration and not achievable imminently.

In Ghana where this study is situated, open defecation remains a huge environmental health challenge for authorities (Adzawla et al., 2020; Osumanu et al., 2019). Almost 5 million people in Ghana have no access to toilet facilities and this places Ghana second after Sudan as the country with the high rate of open defecation in Africa (Osumanu et al., 2019). As of 2015, it was estimated that about 31% of the rural population in Ghana practiced open defecation (WHO & UNICEF, 2017). This practice is more prevalent in the northern part of the country, with the Upper East region leading with 89% of the people in the region lacking access to latrines, followed by the Northern region and Upper West region with 72% and 71% respectively (WHO/UNICEF, 2015). In response to this phenomenon, the government in collaboration with other stakeholders has introduced various programs aimed at ending open defecation. Some of these interventions include the observance of toilet day since 2009, long before the UN designated 19 November as World Toilet Day. Also, human waste management was made a key feature of the Ghana 2010–2013 Shared Growth and Development Agenda.

Furthermore, in July 2015, the government secured a credit facility of 60 million dollars from the World Bank to assist people in five regions of Ghana (Northern, Upper East, Upper West, Brong-Ahafo, and Volta regions) to build their own latrines. In 2018, Media Coalition Against Open Defecation was launched to mobilize the media to educate the populace about the effects of

open defecation. In 2020, WASH Sector Efforts launched a campaign dubbed 'Social Norms Advocacy Campaign' aimed at achieving an open defecation-free environment. All these efforts notwithstanding, open defecation is still being practiced, an indication the problem may be more behavioral than economic or lack of knowledge.

The extant literature is replete with studies on open defecation, the majority of which have focused on ferreting out the causes and drivers of the phenomenon. These studies have reported varied reasons accounting for open defecation (O'Reilly et al., 2017). Belcher (1978) found in Uganda that in the late 1940s, people would not use latrines because it allows sorcerers easy access to their feces. Similarly, Cotton et al. (1995) reported that a respondent in Kumasi would not use the latrine because he is a Muslim and the latrine faces the direction of Mecca. Other drivers of open defecation include economic issues (Abdulai, 2021; Jenkins & Scott, 2007; Water Aid, 2008); socio-cultural values (Bhatt et al., 2019; Osumanu et al., 2019; Water Aid, 2008); religious beliefs (Cotton et al., 1995); superstitious beliefs (Belcher, 1978; Osumanu & Kosoe, 2013) and convenience and comfort (Coffey et al., 2014; Routray et al., 2015). Other studies have focused on assessing the effectiveness of Community-led Total Sanitation (CLTS) interventions (Harter et al., 2020). It is evident in the literature that the phenomenon of open defecation is largely attitudinal and behavioral, yet few studies have looked at the phenomenon from this perspective. Therefore, this paper examines the behavioral and psychological mechanisms that influence attitudes toward open defecation-free behavior in Ghana. This could help in fashioning out more effective interventions to promote the construction and use of latrines by households. This goal coincides with the objective of social marketing, which is to understand and cause a change in the behavior of the target audience (Tweneboah-Koduah et al., 2019).

Social marketing has been defined as "the systematic application of marketing alongside other concepts and techniques, to achieve specific behavioral goals, for a social good" (French & Blair-Stevens, 2007). Maas et al., (2022) assert that social marketing has proven to be an effective tool for behavior change at the micro and macro levels. The concept of social marketing has achieved tremendous success when applied in various social areas, including health, sanitation, and the environment (see Darsareh et al., 2019; Powell et al., 2020). Similar success has been chalked in the Ghanaian context, as social marketing has been employed to address issues such as malaria prevention (Tweneboah-Koduah et al., 2012); HIV/AIDS; (Adu-Mireku, 2003; Tweneboah-Koduah, 2014) and condom usage (Tweneboah-Koduah & Owusu-Frimpong, 2013). Despite these successes, little effort is made to explore the use of social marketing to address the issue of open defecation in the extant literature. Given that open defecation is not an individual but collective health threat (Geruso & Spears, 2018), it requires interventions such as social marketing campaigns that target the entire society instead of focusing on individual behavior change (Hübscher et al., 2021). This study addresses these outlined gaps by adopting a behavior change theory (theory of planned behavior) to understand open defecation-free behaviors among households in Ghana. The rest of this paper is structured as follows: theoretical background and hypotheses, methodology, results, discussion of findings, implications, conclusion, and suggestions for future research.

Theoretical Background and Hypotheses

This study is anchored on the theory of planned behavior (TPB) developed and promoted by Ajzen (1991). The TPB is appropriate for this study because it was developed to predict and explain human behavior (Araujo-Soares et al., 2018; Langford et al., 2018). Besides, the TPB has been established as a good predictor of sustainable environmental behavior (Yadav & Pathak, 2017). Though, there are modified versions of the theory we decided on the original theory with three constructs because we were confident that will better explain the objectives of the study. The basic

assumption of TPB is that behavioral intention is the key determinant of behavior (Ajzen, 1991). The TPB posits that attitude towards a proposed behavior, subjective norm, and perceived behavioral control influence behavioral intention, which subsequently influences actual behavior (Karim Ghani et al., 2013). This theory has been deployed to study various social phenomena. The three constructs of the theory (attitude, subjective norm, and perceived behavioral control) are elaborated upon below.

Attitude and Intention to Adopt Behaviour

Attitude is an emotional attachment an individual exhibits towards a particular behavior, which could predict if the performance of the behavior would produce positive or negative results (Bezzina & Dimech, 2011). In other words, a person with a positive attitude toward a behavior would be motivated to perform that behavior (Botetzagias et al., 2015). Thus, adopting a preferred behavior would depend upon the development of a positive attitude (Rex et al., 2015). This makes attitude a key element in achieving a positive behavioral outcome.

A plethora of studies (Coffey et al., 2014; Cotton et al., 1995; Osumanu & Kosoe, 2013; Water Aid, 2008) have reported that open defecation is largely an attitudinal problem. Studies have also shown that despite the availability of latrines households still preferred open defection. Jain et al. (2020) reported that respondents in their study still engaged in open defecation despite the awareness of the risks the practice poses to their health. Besides, Barnard (2013) argues that the provision of latrines or subsidizing the construction of same without addressing attitudes that would lead to behavioral change will not achieve the desired outcome of latrine use and ultimately an open defecation-free society. The TPB suggests that attitudes toward behavior are shaped by beliefs about what is entailed in performing the behavior and the outcomes of the behavior. In other words, behavioral intentions are influenced by attitude. Given that attitudes influence intention, this study contends that households' positive attitudes toward open defecation-free behaviors influence their intentions to adopt the desired behavior. Therefore, it is hypothesized that;

H1: Households' attitude towards open defecation free has a significant positive relationship with the actual open defecation-free behavior.

Subjective Norms and Intention to Adopt Behavior

Subjective norm as a construct of TPB refers to normative beliefs which are perceived social pressures that are put on a person to behave in a socially acceptable way (Bezzina & Dimech, 2011). These social pressures that put an individual under pressure to transform originate from friends, family members, opinion leaders, and reference groups (Bortoleto et al., 2012). Indeed, subjective norm postulates that an individual would be motivated to engage in a behavior if people he holds in high esteem approve of it (Langford et al., 2018). Subjective norm is widely acclaimed as a good predictor of behavior change. This claim is illustrated in the findings of empirical studies. For instance, Daxini et al. (2018) in their study on factors that influence farmers' intentions to adopt nutrient management planning found subject norms to significantly influence farmers' intention to engage in best land management practices under mandatory requirements. Similarly, Rex et al. (2015) advocate for the use of subjective norm as predictor of behavioral change after they found subjective norms to be a significant predictor of consumers' intention to adopt waste recycling behavior. Thus, households' decision to engage in open defecation-free behavior would be influenced by the views of influencers such as family, friends, peers, opinion leaders, and reference groups among others. In other words, people would engage in open

defecation or adopt the use of latrines if they believe that is the view held by their influencers. Hence this study proposes that:

H2: Households' subjective norms towards open defecation free have a significant positive relationship with their actual open defecation-free behavior.

Perceived Behavioral Control and Intention to Adopt Behavior

Perceived behavioral control refers to an individual's belief in his capacity to perform a particular behavior (Ajzen, 1991; Tonglet et al., 2004). Ajzen (2002) further explains perceived behavioral control to mean the ease with which a person's beliefs can enable him to adopt a behavior following an evaluation of skills, resources, and opportunities needed to perform the behavior. The belief in one's capability to engage in the behavior is usually derived from experience, knowledge shared by peers, friends, and family as well as other factors that may facilitate or militate against the performance of a particular behavior (Ajzen, 1991). Hence, perceived behavioral control would be higher if the individual believes he has the needed resources and opportunities to engage in behavior (Ajzen, 1991). In this case, households perceived behavioral control would be high if they have resources (the funds to construct latrines) or opportunities (access to subsidized latrine construction program). Thus, if households perceive the barriers to the adoption of the desired behavior (latrine use) to be low, the chances for adopting this behavior would be increased and vice versa (Chin & Mansori, 2019). Empirically Rex et al. (2015) reported that individuals are more likely to engage in sustainable behavior if they believe they have control over it. It is in this light that this study hypothesized:

H3: Households' perceived behavioral control over open defecation free has a significant positive relationship with their actual open defecation-free behavior.

Demographics and Behavior

Previous studies have documented the influence of demographic variables such as gender; income and education on the decision-making process in commerce (Schirmer et al., 2018) and behavior change (Laaksonen et al., 2003). In commerce, demographic variables such as gender have been used as a moderator in predicting consumer behavior, as studies have proven that male and female consumers exhibit different buying characteristics (Coley & Burgess, 2003). Furthermore, educational level and average income have been found to influence consumer decisions in different purchase situations (Deshwal, 2016). Similarly, Laaksonen et al. (2003) in their study on income and health behaviors found that income significantly influences individuals' health behavior. We contend that demographic variables (income, education, and availability of latrines) moderate the proposed relationships between attitude, subjective norm, perceived behavioral control, and Ghanaian households' actual open defecation-free behavior. It has been reported in the literature that people would still resort to open defecation despite the availability of safe sanitary facilities (Belcher, 1978; Cotton et al., 1995). Based on these we proposed the following hypothesis;

H4a: Income moderates the relationship between attitude and households' actual open defecation-free behavior.
H4b: Income moderates the relationship between subjective norms and households' actual open defecation-free behavior.
H4c: Income moderates the relationship between perceived behavioral control and households' open defecation-free behavior.

H5a: Educational level moderates the relationship between attitude and households' actual open defecation-free behavior.
H5b: Educational level moderates the relationship between subjective norms and households' actual open defecation-free behavior.
H5c: Educational level moderates the relationship between perceived behavioral control and households' actual open defecation-free behavior.
H6a: Availability of latrines moderates the relationship between attitude and households' actual open defecation-free behavior.
H6b: Availability of latrines moderates the relationship between subjective norm and households' actual open defecation-free behavior.
H6c: Availability of latrines moderates the relationship between perceived behavioral control and households' open defecation-free behavior.
These hypothesized relationships between the constructs are illustrated in Figure 1.

Methodology

Sample and Data Collection Procedure

The target population of the study was households (this study defines a household as a person or a group of persons, who lived together in the same house or compound and shared the same house-keeping arrangements) in the Northern region of Ghana, specifically in Tamale Metropolis. This is one of the regions with a high rate of open defecation. Since the sample frame for the households was not known (Saunders et al., 2012), convenient sampling was appropriately used to select a targeted sample of 550 households. This was after the households in the target area were initially approached and informed about the study's objectives and whether they were willing to take part in the study. Households who form part of the sample were those who freely expressed their willingness to be part of the study. A total of 550 questionnaires were distributed to the selected sample. After the questionnaires were retrieved and screened for completeness and outliers, 512 were found to be useable and this represented a response rate of 93%. Data collection lasted for 6 weeks.

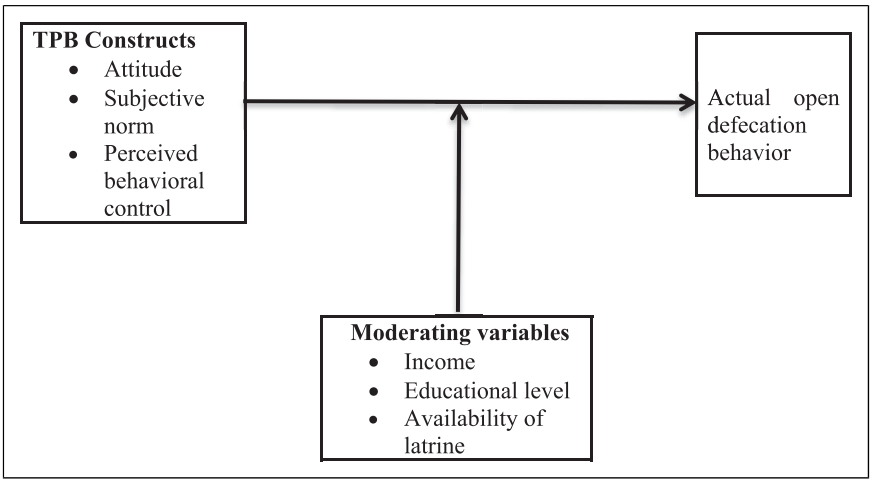

Figure 1. Conceptual framework.

Measures

Given that this study adopted a quantitative methodology, a questionnaire was required for data collection. All measurement items except open defecation-free behavior were adapted from past studies. All three constructs of the TPB (attitude, subjective norm, and perceived behavioral control) were measured with four items adapted from Yuan et al. (2016), Nguyen et al (2015), and Karim Ghani et al. (2013). Behavior (open defecation-free) was measured by four items which were developed after an extensive literature review. All the items were measured on a five-point Likert scale that ranged from 'strongly disagree' to 'strongly agree'. Before the survey, the questionnaire was assessed for reliability and content validity by two senior lecturers with expertise in social marketing (Yi & Gong, 2013). Their inputs were incorporated into the final questionnaire. To ensure contextual fit as suggested by Hair et al. (2007), a pilot test of the questionnaire was conducted involving 25 respondents from the study area. This also helped in making the scale items clearer and more precise (Malhotra et al., 2017).

Ethical Considerations

The Committee for Human Research and Ethics of the University of Energy and Natural Resources provided the ethical clearance (UENR/CHRE/0020) for this study to be conducted. Furthermore, written consent was obtained from the participants in the study. The research instrument was designed without questions that sought to invade respondents' privacy. The participants were made aware of their rights not to answer any question that they did not feel comfortable about. With respect to confidentiality and data protection, it was made known to the respondents that their identity will be protected since their names will not be captured as part of the data.

Results

Demographic Characteristics of Respondents

The majority (75.20%) of the respondents were males while most of the respondents were in the age cohort of 41–50. This was followed by the cohort of 51–60 years who make up 23.83% of the sample. The relatively young (21–30) age cohort was the least among the sample as they accounted for 12.69%. The majority (32.23) of the respondents had a bachelor's degree as their highest educational qualification. Those with postgraduate qualifications constituted 27.73% of the sample. Respondents with diploma qualifications accounted for 17.96% of the sample. Less than 10 percent of the sample had no formal education. As illustrated in Table 1, because more than 60% of households have access to latrines, arguably the problem of open defecation is not solely economic; it could be seen also as attitudinal and behavioral.

Assessment of Measurement Model

A confirmatory factor analysis (CFA) was carried out to test the reliability and validity of the measurement items since they were all adapted from past studies. The CFA results indicated goodness-of-fit of the measurement model (X^2/df = 2.74; GFI = .936; NFI = .923; TLI = .932; CFI = .938; RMSEA = .068), details are displayed in Table 2. The RMSEA value of .072 is within the acceptable threshold (Hair et al., 2007). The goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), the normed fit index (NFI), and the comparative fit index (CFI), each as a rule of thumb has to exceed a threshold value of .9 for model fitness (Hair et al., 2007).

Table 1. Respondents Demographic Characteristics.

Characteristics	Frequency	Percentage
Gender		
Male	385	75.20
Female	127	24.80
Total	512	100
Age		
21–30	65	12.69
31–40	90	17.58
41–50	152	29.69
51–60	122	23.83
61 and above	83	16.21
Total	512	100
Education		
Postgraduate	142	27.73
Degree	165	32.23
Diploma	92	17.96
SHS	63	12.30
No formal education	50	9.8
Total	512	100
Access to latrine		
Yes	328	64.06
No	184	35.94
Total	512	100

Internal consistency tests of the measurement items were carried out using the procedure of Fornell and Larcker (1981). The required threshold of each construct composite reliability is .7 and above (Fornell & Larcker, 1981). Malhotra and Dash (2011) defined composite reliability (CR) as the total amount of true score variance in relation to the total score variance. The composite reliability of all the constructs as well as the Cronbach alphas (α) included in the model exceeded the threshold of .70. The average variance extracted (AVE) for all constructs (which determines convergent validity) exceeded the acceptable threshold of .5. In testing for discriminant validity, the criterion proposed by Fornell and Larcker (1981) was followed. All the inter-construct correlations were less than the AVE on the diagonal, confirming the validity of the constructs in the model (see Table 3).

Structural Model Analysis and Testing of Hypotheses

Structural equation modeling (SEM) was used to test the theorized hypotheses in this study. According to Bagozzi and Yi (2012), SEM is the appropriate analytical tool to use if the aim is to establish a causal relationship between constructs. The structural model was used to check the significance of the path coefficients between different variables. The results as displayed in Table 4 demonstrate adequate model fit $X^2/df = 2.57$; GFI = .934; NFI = .945; TLI = .953; CFI = .970; RMSEA = .069).

An alpha level of ≤.05 was set as the threshold of significance value. Thus a significant value which is less than the threshold of .05 indicates that a hypothesis can be accepted, however, with a significant value that is greater than the acceptable value of .05, the hypothesis should be rejected.

Table 2. The Measurement of Constructs.

Construct	Item code	Loadings	CR	AVE	α
Attitude	ATT1	.68	.83	.61	.83
	ATT2	.81			
	ATT3	.83			
	ATT4	.80			
Subjective norm	SN1	.78	.86	.67	.87
	SN2	.84			
	SN3	.82			
	SN4	.81			
Perceived behavioral control	PBC1	.68	.80	.59	.72
	PBC2	.85			
	PBC3	.73			
	PBC4	.79			
Open defecation free behavior	ODFB1	.85	.93	.81	.92
	ODFB2	.92			
	ODFB3	.93			

X^2/df = 2.74; GFI = .936; NFI = .923; TLI = .932; CFI = .938; RMSEA = .068.

Table 3. Discriminant Validity.

Construct	CR	AVE	ATT	SN	PBC	ODFB
Attitude	.832	.614	**.791**			
Subjective norm	.864	.672	.732	**.822**		
Perceived behavioral control	.803	.593	.564	.561	**.713**	
Open defection free behavior	.934	.814	.643	.541	.361	**.912**

Note: Square roots of the AVEs are reported diagonally in bold.

The results in Table 4 indicate that H1 which proposed that households' attitude towards open defecation-free has a significant positive relationship with actual open defecation-free behavior is supported (β = .62, t-value = 6.56, $p < .001$). Hence a household's positive attitude towards open defecation-free significantly influences the decision to adopt open defection-free behavior.

We proposed in H2 that, a household's subjective norms towards open defecation-free have a significant positive relationship with their actual open defecation-free behavior. The study found support for this proposition, that, the subjective norm has a significant positive influence on actual open defecation-free behavior (β = .29, t-value = 4.13, $p < .001$). H3 was also supported as the results show that households' behavioral control has a significant positive influence over their actual open defecation-free behavior (β = .36, t-value = 5.63, $p < .001$). This indicates that households' perceived degree of control over open defecation-free has a significant positive influence on their actual open defecation-free behavior.

Moderation Effect. One of the aims of this study was to examine the moderating effect of demographic variables (income level, educational level, and availability of latrines) on the three proposed relationships between attitude, subjective norm, perceived behavioral control, and actual open defecation-free behavior (H1, H2, and H3). The results as displayed in Table 5 demonstrate that the relationship between attitude and actual open defecation-free behavior is not moderated by income (β = −.37, $T = -.08$), educational level (β = −.59, $T = -.13$) and availability of latrines

Table 4. Structural Model Analysis and Testing of the Hypotheses.

H	Paths	β Estimates	*T*-Value	*p*-Value	Results
H1	Attitude → actual behavior	.62	6.56	***	Supported
H2	Subjective norm →actual behavior	.29	4.13	***	Supported
H3	Perceived behavioral control → actual behavior	.36	5.63	***	Supported

R^2 = .50 H = hypotheses.
RMSEA = .068 GFI = .944, NFI = .940, TLI = .946, CFI = .961, X^2/df = 2.59.

Table 5. Moderation Path Results.

Relationships	β Estimates	*T*-Value	*p*-Value
Attitude → income → actual behavior	.37	−.08	.90
Subjective norm → income →actual behavior	.51	4.61	***
Perceived beh. control→ income →actual behavior	.14	3.30	***
Attitude →education →actual behavior	.59	−.13	.94
Subjective norm →education →actual behavior	.34	2.81	***
Perceived beh. control →education →actual behavior	.24	2.26	***
Attitude → availability of latrine →actual behavior	.16	2.07	.38
Subjective norm → availability of latrine →actual beh	.15	2.11	***
Perceived beh. control → availability of latrine → actual behavior	.22	2.41	***

*$p \leq .01$; **$p \leq .05$; ***$p \leq .001$.

(β = −.16, T = −2.07). This indicates that H4a, H5a H6a are not affirmed. However, the relationship between subjective norm and actual open defecation-free behavior is moderated by income (β = .51, T = 4.61), educational level (β = .34, T = 2.81), and availability of latrine (β = .15, T = 2.11). These results demonstrate that H4b, H5b, and H6b are confirmed. The results also indicate that the relationship between perceived behavioral control and actual open defecation-free behavior is moderated by income (β = .14, T = 3.30), educational level (β = .24, T = 2.26) and availability of latrines (β = .22, T = 2.41). Hence, the proposed relationships in H4c, H5c, and H6c are confirmed.

Discussion of Findings

This study sought to assess the relationship between the variables of the TPB (attitude, subjective norm, and perceived behavioral control) and open defecation-free behavior. The findings revealed that all three variables have a significant positive influence on open defecation-free behavior. Among the three constructs, the attitude construct had the highest significant influence on open defecation-free behavior. This indicates that Ghanaian households' attitude towards open defecation-free has a significant positive influence on their actual open defecation-free behavior. In other words, households with positive attitudes toward open defecation-free would be motivated to adopt open defecation-free behavior such as latrine use. This finding confirms the view in the literature that a person with a positive attitude toward a particular behavior would be motivated to perform that behavior (Botetzagias et al., 2015). Again this finding corroborates that of Tweneboah-Koduah et al. (2019) who found that attitude had a significant positive influence on Ghanaian households' actual waste disposal behavior.

The next construct with the highest significant influence on actual open defecation-free behavior was perceived behavioral control thereby confirming H3. Thus, Ghanaian households' perceived behavioral control over open defecation-free significantly influences their actual open defecation behavior. That is, Ghanaian households' beliefs of their capacity to adopt open defecation-free behavior significantly influence their actual adoption of open defecation-free behaviors such as the adoption of latrine use. This finding aligns with that of Cheung et al. (1999), who found perceived behavioral control to be a significant predictor of intention to recycle waste paper.

Subjective norm was also found to have a significant positive influence on actual open defecation-free behavior of Ghanaian households. Hence, H2 which proposed that a household's subjective norms towards open defecation-free have a significant positive relationship with their actual open defecation-free behavior was supported. This finding indicates that Ghanaian households would be motivated to adopt open defecation-free behavior if the referent others (friends, family members, opinion leaders, and reference groups) approve of it. Thus, households would adopt the use of latrines; if they see people they regard use latrines or advocate for the use of same. This finding corroborates that of previous studies (Cheung et al., 1999; Daxini et al., 2018; Mancha & Yoder, 2015; Norman & Cooper, 2011).

With regards to the moderation effect, the study proposed nine hypotheses (H4a, b, c, H5a, b, c, and H6a, b, c), that is demographics (income, education, and availability of latrines) moderate the three proposed relationships in H1, H2, and H3. The study found that income, education, and the availability of latrines have no moderating effect on the relationship between attitude and actual open defecation-free behavior. This is an indication that Ghanaian households' income level and education level do not influence their attitude toward open defecation-free behavior. The study also found that the availability of latrines does not influence Ghanaian households' attitude towards open defecation-free behavior. In other words, forming a positive attitude towards behavior cannot be influenced by the educational level and financial status of the individual. The findings also revealed that income, educational level, and the availability of latrines moderate the relationships between subjective norms, perceived behavioral control, and actual open defecation-free behavior. These indicate that households' decisions to adopt actual open defecation-free behavior are not only influenced by the normative beliefs of people they hold in high regard but also their income and educational level.

Implications for Theory

The findings of this study make a modest yet significant contribution to our understanding of the application of the TPB in the sphere of behavior change in a developing country context. The study extends the current literature on TPB by showing that TPB could be used to predict the behavior of people toward a social phenomenon (open defecation). In doing so, this study enriches the literature on open defecation, given that the existing knowledge in the field has largely focused on the causes and drivers of the phenomenon of open defecation. This study particularly, shows that attitude and perceived behavioral control are the key predictors of open defecation-free behavior. Also, an individual's positive attitude towards open defecation-free behavior is not influenced by demographics such as income, educational level, and the availability of latrines. However, individuals' subjective norms and perceived behavioral control towards open defecation-free are significantly influenced by their income, educational level, and availability of latrines. In addition, this study broadens the literature on the social marketing discipline. The study provides insight into priority audiences' attitudes, subjective norms, perceived behavioral control, and actual behavior (open defecation-free behavior). The study gives insights on priority audiences for any future intervention targeting of open defecation practices in Ghana. This study

enhances the fifth step of the 10 steps planning process of social interventions proposed by Lee and Kotler (2019). For example, the study enriches the literature by providing answers to what motivates the practice of open defecation, the barriers that inhibit behavior change, and what respondents (priority audience) benefit from the behavior (open defecation-free). It also explains the role of influential others in the behavior change process. The phenomenon of open defecation by this study becomes one of the social phenomena that have been studied from the perspective of social marketing.

Practical Implications

The findings of this study have some implications for policymakers and social marketing interventions. Among the three constructs of TPB, attitude was found to be the most significant predictor of households' open defecation-free behavior. This implies that policymakers and implementers' social marketing interventions should design and execute open defection interventions that promote and develop a positive attitude towards open defection-free behaviors in communities where open defecation is practiced. Perceived behavioral control was found to be the second strongest predictor of households' open defecation-free behavior. This suggests that government policy interventions on open defecation should be aimed at reducing the barriers that inhibit the adoption of open defecation-free behaviors. Given that income level is found to have moderating effect on households' open defection-free behavior, this study recommends that government should facilitate the provision of latrines for households by providing financial assistance to those who cannot afford them. In addition, intensive public education should be carried out to demystify the myths surrounding latrine use.

Conclusion

Open defecation remains a global health challenge plaguing many communities around the world, particularly in developing nations. This study, therefore, sought to contribute to the understanding of the phenomenon through the lens of social marketing. Specifically, the goal of this study was to understand the behavioral and psychological mechanisms that influence attitudes toward open defecation-free behavior in Ghana. Pursuant to this the TPB was adopted to guide this study. The outcome of the study indicates that all three variables of TPB have significant positive relationships with Ghanaian households' open defecation-free behavior. The study also revealed that the formation of a positive attitude towards open defecation-free behavior by Ghanaian households is not moderated by demographics such as income, educational level, and availability of latrines. This study concludes that if households form a positive attitude towards open defection-free they are likely to adopt open defecation-free behavior such as latrine use. Furthermore, the opinions of referent others such as family, friends, and opinion leaders do influence Ghanaian households' actual open defecation-free behavior. While demographic variables such as income level, educational level, and availability of latrines do not influence the relationship between attitude and actual open defecation-free behavior, they do have a significant influence on the relationships between households' subjective norms, perceived behavioral control, and their actual open defecation-free behavior.

Limitations and Suggestions for Future Research

This study like any literary work is not without limitations. Given that this study focused on only one region in a developing country it suffers from the weakness of generalization. In the future, a replicated study could be carried out involving the whole country or even a multi-country context

study. Also, the findings of this study are based on cross-sectional data which may suffer from the assumption of static relationships among the variables used at a particular point in time. Future studies could adopt a longitudinal approach to examine the pattern of change and the extent to which intentions that are based on positive attitudes influence open defecation-free behavior over time. This study deployed the theory of planned behavior to understand the phenomenon of open defecation, the findings of this study could be validated if future research used a different behavior change theory to study the same phenomenon. This study employed a cross-sectional survey; hence it may presume static relationships among the constructs which can be cured by a future longitudinal study that could explain the pattern of behavior change.

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