Annals of R.S.C.B., ISSN: 1583-6258, Vol. 25, Issue 5, 2021, Pages. 5826 - 5843
Received 20 May 2021; Accepted 25 May 2021.

The Impact of Social Marketing Intervention on Reducing Water Consumption: an Extension to the theory of Planned Behavior

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ABSTRACT

Social marketing programs have been widely applied to influence behavior for individuals and society benefits. This study aims to examine if social marketing is an effective approach to induce behavior change in terms of water consumption, and how regulations may be aligned and integrated with campaign goals. We assessed the campaign's effectiveness using a cross-sectional survey. Data were collected from Jordanian aged 18 years and older, a questionnaire designed according to the theory of planned behavior TPB. Sample size (n = 2638). Results suggest that the campaign was effective in reducing water consumption, further, governmental rules and regulations impact individual intention and behavior to reduce water consumption. The TPB which forms the theoretical framework of this study show a fitting structure that permits the examination of the influence of this campaign. This study contributes to previous literature by reporting a focused and successful social marketing campaign as one of the first studies to examine changes to household water consumption within the context of social marketing in Jordan. Furthermore, this study sought to extend the TPB by adding a variable, namely: government regulations

Keywords
Theory of planned behavior, social marketing, government regulations, waterconsumption

Introduction

Water shortage is a major ecological issue that societies face these days. According to, Boulay et al. (2018), worldwide water consumption has dramatically multiplied in recent years. Jordan is considered among the least fortunate nations on the planet regarding water assets (Hegde, 2020), and the accessibility of water is named exceptionally low on the Water Stress Index (von Lossow & Shatat, 2020), which demonstrates the level of water lack or shortage. The shortage of water assets is one of the primary difficulties for Jordan and a restricting factor for financial advancement particularly for agribusiness (Bataineh & Zecca, 2017). The demand for water assets is expanding with time for both agribusiness and non-agrarian purposes, and therefore, fulfilling water needs has become critical where the population is expected to twofold by 2047 (Hussein, 2019). Further, environmental changes and the changing of rainfall patterns in the locale also disturb the issue (Bataineh & Zecca, 2017).

Water shortage impacts all aspects of Jordanian life, and Jordan devours more water than is accessible from renewable sources, currently, renewable water supply meets only 50% of total water consumption (Jaradat, 2018). Scarcities are caused by unsustainable groundwater extraction, including the huge number of illegal private wells. Consequently, the public in Jordan has experienced tensions over water shortage even before the arrival of refugees from Syria in the last ten years (Kaarud Mansour Mohamed, 2020). With this rapid increase in population and the gap between obtainable water and demand has expanded significantly, Jordan is facing a continuous imbalance between the total sectoral water demands and the availably of freshwater supply of freshwater. One solution to solve this problem is increasing the supply of water such as building new dam or desalination plants (Hadadin, Qaqish, Akawwi, & Bdour, 2010; Al-

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Gasawneh & Al-Adamat, 2020); however, those measures are very difficult to build because it requires financial resources that government can't afford (Hadadin et al., 2010). Further, applying a high price strategy to manage household water demand would perceive as socially inequitable and politically argumentative (Molle, Venot, & Hassan, 2008; Hawamleh et al.,2020). Therefore, social marketing campaigns may be the solution where the ultimate goal is voluntary behavior change to decrease water consumption, this provides the potential to foster sustainable consumption of a progressively scarce, yet essential resource (Lowe, Lynch, & Lowe, 2015; Ngah et al., 2021).

The high demand for water in Jordan is managed through a mix of regulations and setting that restricting water usage and targeting individuals, directly and indirectly, to influence water usage behavior voluntarily through huge social marketing campaigns (Azzam, 2019). Regarding policies and regulations interference, the Jordanian government established policies, strategies, and activities to use water efficiently to reduce unnecessary water usage and to manage freshwater natural resources to meet the current and future demand (Alqadi & Kumar, 2014). Additionally, repairing water leakage pipes completed in a distribution system and the use of perforated tubing for irrigation. Also, financial and administrative measures were applied to help reduce water demand, increasing water prices, for instance, will make people more cautious in their water usage. On the other hand, the Jordan government promotes behavioral change through a comprehensive social marketing campaign targeting the public and decision-makers to raise water use efficiency (Alqadi & Kumar, 2014; Ahmad et al., 2020). According to Frederiks, Stenner, and Hobman (2015), interventions must link public awareness, behavior change, incentives, and conservation with sustainable strategies for national development. In the same way, the Jordan government, with partners like USAID, established several goals in campaigns focusing on raise awareness of water scarcity and involve the population in ways to lessen its impact, and set many behavioral change campaigns targeting different sectors of society such as households, schools, and communities as well as main cities (Hussein, 2018; Nusairat et al., 2017). "By Yalla Nwaffer Mai, We Preserve it to Survive -Water We Live", launched in different media channels aiming to encourage individuals to save water at home through a series of water-saving practices (Water, 2015). Additionally, the government introduced school programs to educate students on critical needs and practical responses to this issue. Also, education at the technical institution level (plumbers) and the university level (bachelor's and master's degree in Water Demand Management) have been implemented (Water, 2015). These interventions' outcomes have not been evaluated yet and it is not clear yet if behavior change was a result of those interventions or regulations. therefore, the objective is to examine if social marketing is an effective method to induce behavior change in terms of water consumption, and how regulations may work in line with campaign goals.

Social marketing

Social marketing is a new discipline that was coined about forty years ago. Currently, social marketing is seen as a behavioral change tactic used to promote and influence change by delivering societal and individual benefits (Kotler & Zaltman, 1971). The key feature of the social marketing approach is that it used commercial marketing principles and applies these techniques to resolve health, social and environmental issues (Kotler & Zaltman, 1971). In the past 40 years, social marketing has been successfully applied in a variety of health and social problems to change behavior for the benefit of individuals and/or society around the world (Frost

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et al., 2018). The results of those programs revealed a positive effect on some problems including moderate alcohol consumption (Pham, Rundle-Thiele, Parkinson, & Li, 2018), breastfeeding (Parkinson, Russell-Bennett, & Previte, 2018), and reduce crashes due to driving under the influence of alcohol (Chao, Cismaru, Lavack, & Markewich, 2009; Nusairat, Rashid & Rembielak, 2015) and tobacco intake (Almestahiri, Rundle-Thiele, Parkinson, & Arli, 2017).
According to French and Blair-Stevens (2010), social marketing must-have core elements components which include: the ultimate goal for social marketing must be achieving behavioral change; obtaining targeted audience insight is necessary to gain an in-depth understanding about what inspires and moves the individual to change their behavior; segmenting customers into different groups that have similar features to design a suitable message which matches the segment's needs; providing the target audience with something beneficial in return for exchanging with the proposing; Considering competition by providing benefits which best distinguish healthy options from the competing behaviors; applying a full marketing mix when designing social marketing program; and finally, by applying theory, interventions are more likely to create more success.

Social marketing has been successfully used in changing a wide variety of behaviors in different scenarios. As a holistic approach, it can be accomplished through three main streams which are: upstream, midstream, and downstream (Andreasen, 2006). Upstream emphasizes creating change at the regulations level and policymaker to facilitate the desired environment so the goal can be achieved, midstream efforts target behavior change at a collective level such as cooperate with organizations and community centers, and downstream target individuals whose behavior needs to change at a personal level (Andreasen, 2006; Dibb & Carrigan, 2013). Each of the three streams differs in terms of the target audience, intervention settings, and the actual behavior change required (Hoek & Jones, 2011). By building partnerships with different stakeholders at the three levels will deliver the capital and infrastructure required to surge intervention effectiveness. There is a widespread belief among social marketers that adopting upstream is as significant as a downstream intervention. Upstream social marketing suggests that influencing regulators, policymakers, managers and educators can assist to address a variety of societal problems and that these groups can be treated as target audiences in a similar approach to conventional interventions.

Recently, social marketing scholars and practitioners have suggested that social marketing should extend its scope beyond individuals and try to influence those who help shape regulations (Dibb, Carrigan, & Gordon, 2013; Key & Czaplewski, 2017). The idea is that marketing concepts and practices can be applied to influence the behaviors of policy and decision-makers and opinion leaders to encourage regulation change, which in turn, can facilitate the environment in which individual behaviors run (Key & Czaplewski, 2017). For example, regulations have been influential factors in changing the environment for smoking behavior, including bans on all tobacco marketing activities, applied free smoking areas, forced companies to apply visual warning on packs showing the effect of smoking(Almestahiri et al., 2017). Upstream refers to how we change the policies, regulations, laws, and environmental barriers that limit behavioral change, to provide a suitable mechanism allow behavior change to take place, regulations within social marketing acknowledges that people are not always responsible for their behavior (Rob Donovan & Henley, 2010; Hoek & Jones, 2011; Wymer, 2011). The upstream approach provides protective measures that can be used by agencies and different organizations to achieve the desired behavior change (Dibb et al., 2013). For example, reducing water consumption, the

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Jordanian government applied regulations to restrict the excessive of using water waste such as repair of leaking water pipes in a distribution network, use a drip irrigation system, Setting a high price for water to make people more watchful in their water usage (Water, 2015). Social marketing scholars (Andreasen, 2006; RJ Donovan, Boulter, Borland, Jalleh, & Carter, 2003; Goldberg, 1995) are increasingly advocating that when design social marketing interventions to consider implementing upstream and downstream approaches to increase program effectiveness.

Conceptual Framework

The theory of planned behavior (TPB) is a beneficial conceptual instrument for social marketers (David & Rundle-Thiele, 2018) which can be used as guidelines when investigating a social behavior that desires to be understood, and every construct could be analyzed to develop an understanding of behavior and what factors that can influence it (David & Rundle-Thiele, 2018). The TPB forms the theoretical framework of this study as it proposes a clearly defined structure that permits the examination of the influence that attitudes, social norms, and perceived behavior control have on individuals' intentions to reduce water consumption. According to Ajzen (1991), the behavior is directed by three types of beliefs: behavioral (attitudes), Normative (subjective norm), and subjective (perceived behavioral control) which in turn influence human intention to perform a certain behavior. In brief, attitude defines the degree to which humanity has a favorable appraisal or evaluation of certain behavior, while, subjective norm explains the impact of social pressure to carry to completion or not to a certain behavior (Rise, et al., 2010). Behavioral control expresses the perceived ease of individuals to perform a certain behavior, thus influencing intentions to complete the behavior. Finally, intentions to perform a behavior are a predictor of behavioral performance (Ajzen, 1991).
The TPB has been used widely to predict different behaviors in a variety of populations included (but not limited to) smoking (Higgins & Conner, 2003), alcohol consumption (Cooke, Dahdah, Norman, & French, 2016), health services utilization (Schomerus, Matschinger, & Angermeyer, 2009), physical exercise (Jones, Sinclair, Rhodes, & Courneya, 2004), breastfeeding (Swanson & Power, 2005) in a different developed country context. Accordingly: we hypothesis:

H1: intervention to reduce water consumption has a significant positive effect on attitude to minimize water wastage.
H2. intervention to reduce water consumption has a significant positive effect on normative beliefs to reduce water wastage.
H3. intervention to reduce water consumption has a significant positive effect on control beliefs to reduce water waste
H4: intention to reduce water waste will lead to behavior changes in water consumption.

In recent years, The TPB has extensive research attention as it provides a theoretical framework for systematically examining the factors that influenced behavioral adoptions (Ajzen, 2011). Ajzen (1991) suggested that the TPB is open to further predictors, as a result of improving the predictive power of construct. Numerous scholars added extra predictors in an attempt to clarify many behaviors (Botetzagias, Dima, & Malesios, 2015; Chan & Bishop, 2013; Conner & Armitage, 1998; Heath & Gifford, 2002). the current study aims to clarify studies related to social marketing use with the TPB and further predictor derived from the social marketing field which is governmental regulations. Despite the popularity of TPB, rules and regulations should take into account governmental rules and regulations because this construct has been neglected by TPB.

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An individual's choice about either performing a specific behavior or not is generally related to policies and regulations restrictions. We, therefore, suggested that not only attitude, subjective norms, and perceived behavior control are impacted intention to behave, but also regulations and policies influences perform or refuse to perform a certain behavior as well as the intention to behave. The structure of the proposed framework is shown in Figure 1; Therefore, we hypothesis :

H5: governmental regulations have a positive influence on the intention to reduce water waste
H6: rules and regulations influence actual behavior to reduce water waste

This study explained in detail a case study of a successful social marketing campaign targeting reduces water consumption in a drought-affected country "Jordan". In this country, water usage was decreased to more sustainable levels through a successful social marketing campaign targeting the population as a whole. This case is highly related to the social marketing discipline where there are increasing calls for research targeting different environmental problems in general and water usage in particular (Mercure et al., 2019; Vanham et al., 2018). The extant research literature and this case study are integrated to form several propositions about general population water consumption behavior. Consequently, this paper contributes to previous literature by reporting a focused and successful social marketing campaign as one of the first studies to examine changes to household water consumption within the context of a social marketing program designed to reduce consumption. Furthermore, social marketing scholars and practitioners have reported a need to apply theories of behavior change and any intervention to heighten campaign effectiveness, it is surprising that there are little empirical research has been conducted on the topic, especially on the application of the TPB to water consumption intervention programs in Jordan. To fill this gap, this research seeks to examine the constructs of the TPB model in social marketing interventions on water wastage and adding a variable, namely: government regulations.

Methodology

Survey-based study

A Quantitative research method was applied in this study using an online self-administrative questionnaire was published using Google Docs to collect data. The researchers developed the questionnaire based on the literature utilizing the TPB model by (Ajzen, 1991). Participants were recruited via online convenience sampling by employing two recruitment methods to test the hypothesis and to validate the model. Firstly, an online survey was administered via two channels. The researchers emailed a link to stored names of people who had previously given consent to be contacted for further research. To extend the online sample the survey link was posted on social media sites, for example, Facebook achieving additional respondents. Further, Snowball sampling was also utilized by having friends and family recruit their contacts via Facebook. Second, drawing on the researchers' personal and professional network respondents were approached in person by the researcher with a hard copy version of the online survey. The study sought participants who live in Jordan permanently and who are at age of 18 years old or more. The ethical practice was maintained in this study where participation is completely voluntary and respondents were assured that information provided is confidential and it will not be disclosed to third parties and anonymity will at all times be safeguarded. This study used an

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incentive of a chance to win one of five 50 JOD (75 USD), for participants who filled questionnaires, were offered as a draw prize.

Study Measures

The questionnaire covered two components: the first part tested socio-demographic characteristics of survey participants such as age, gender, educational attainment, employment status, and occupation while the second section testing the TPB components related to reducing water consumption. The demographic variables were included in the questionnaire as evidence which suggests that these variables have an impact on environmental attitudes, social norms, intention to behave, and actual behaviors. To operationalize the TPB, Likert scale questions were developed and applied in this study. The questionnaire covered all concepts: attitude, subjective norm, Perceived behavior control, intention, and behavior. The questionnaire version was reviewed by academics to provide feedback in terms of wording, structure, and concision of statements, and the entire form and the final version of the questionnaire applied in the study. The responses of all statements were captured on a five-point scale (1 to 5), with 1 indicate to strongly agree, 2 agree, 3 neutral, 4 disagree and 5 strongly disagree.

To begin with, in the attitude construct, participants rated their response based on four statements include "reduce water consumption would be beneficial for the environment, beneficial for humans and animals, help humans in overcome water shortage issues, and be considered as an ethical act" (Aliabadi, Gholamrezai, & Ataei, 2020). Subjective norm. respondents were asked to evaluate their level of agreement to three statements about the perception of social pressure to reduce water consumptions "most people who are important to me think that I should reduce water consumption, my friends would approve of me reduce water use and my family thinks that I reduce water use" (Liu et al., 2020). Perceived behavioral control, respondents were requested to evaluate their level of agreement or disagreement with four statements rating "how easy they thought reducing water usage was (eg the decision to decrease water use is under my complete control, factors outside of my control could prevent me from reducing water use" (Liu et al., 2020). Intention to reduce water, participants were asked to rate how the campaign enhance their willingness to plan to eliminate water waste tested on three questions " I will try to reduce water consumption when I have a bath, I would try to reduce water consumption even if I am out of my home" (Aliabadi et al., 2020). Reduce water consumption Behaviour was examined by asking participants to report how the campaign influenced their actual behavior "makes them minimize their daily water consumption, Makes them stop water wasting water consumption" (Aliabadi et al., 2020). Finally, rules and regulations tested by four questions according to (Katner et al., 2016), those dimensions include (the shortage of supplements would prevent individuals from excessive use, the high price of water makes people reduce water consumption, water supply, one day a week, pushed people to reduce water consumption, water supply system at home have helped people to reduce water consumption).

Results

The survey was conducted for three months and generated a total of 2638 usable responses. The sample demographic description is presented *in table 1.* Overall characteristics of the sample showed that 42.9% of the respondents are females while 57.1% are males. The majority of the age groups are located from 39 to 46 years with 32.1% of the total samplewhereas the group 32-39 years old represent 28.5%, and the last group was 18-25 years with 9.3%. A total of 88% of

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the respondents are holding a bachelor's degree while diploma holders were 3.2%. The highest percent of the sample has a monthly income between ranged between 501- 750 Jordan dinar consist of 33.5% and the least percentage was 1251jordan dinar and more with 8.4%.

Table 1: sample desription

Gender	**Frequency**	**Percent**
Male	1506	57.1%
Female	1132	42.9%
Age Groups	**Frequency**	**Percent**
18 - 25 years	245	9.3%
>25 - 32 years	491	18.6%
>32 -39 years	752	28.5%
>39 - 46 years	847	32.1%
> 53 years	303	11.5%
Educational qualification	**Frequency**	**Percent**
High school or less	145	5.5%
Diploma	84	3.2%
Bachelor Degree	2321	88.0%
Postgraduates	88	3.3%
Monthly Income in JoDs	**Frequency**	**Percent**
Up to 500	308	11.7%
501-750	883	33.5%
751-1000	824	31.2%
1001-1250	402	15.2%
1251 or more	221	8.4%

Exploratory factor analysis

The goal of factor analysis is to extract items that are highly correlated into variables to explain and interpret the results. The first step of analysis in this study is to conduct exploratory factor analysis since it summarizes data into factors that will be achieved. In exploratory factor analysis, four tests are used which are: Kaiser-Meyer-Olkin (KMO), Bartlett's Test, Pattern Matrix, and factor correlation matrix. KMO and Bartlett's test measure of sampling adequacy examining whether or not the data are applicable to be tested by factor analysis. The results of the current study show revealed a 0.93 and .00 respectively indicating that the data is suitable for factor analysis.

Reliability and Validity

Pattern matrix using maximum likelihood with Promax rotation used to examine convergent validity. Convergent validity test correlation between the items that are supposed to measure the

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intended factors are correlated. The minimum value of loading each factor in the pattern matrix should be more than .30, and it should not cross load on other factors. The first test shows that the items extracted six variables *(see table 2*). However, some of the items were cross a load of more than one factor with a value above 0.35 e.g (SNO4) resulting in the elimination of that item from further analysis. After repeating the pattern matrix test, all items loaded in proposed factors and their weights were above the minimum value of 0.3 and explained 73.51% of the total variance. As table 2 below shows, four factors belong to perceived behavioral control ranged from .839 to .862, the second factor (attention) four items ranged from .815 to .86. Similarly, subjective norms items ranged from .898 to .927, behaviour from .838 to .847, governmental regulations from .837 to .847 and intention from .792 to .845.

Table 2: Pattern matrix

	Factor					
	1	2	3	4	5	6
PBC3	.862					
PBC2	.853					
PBC1	.849					
PBC4	.839					
Att4		.860				
Att2		.835				
Att1		.817				
Att3		.815				
SNO1			.927			
SNO3			.920			
SNO2			.898			
BHV1				.847		
BHV2				.843		
BHV3				.838		
GOV1					.847	
GOV3					.841	
GOV2					.837	
INT3						.845
INT2						.824
INT1						.792

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Furthermore, the factor correlation matrix in table (3) describes variability among correlated variables in terms of a potentially lower number of unobserved variables to examine the discriminant validity. Discriminant validity is used to test whether the factors are supposed to be correlated or not. The factor correlation matrix in table 3 below shows that all the correlations between factors ranged from .396 to .570 which are below 0.7 as suggested. In other words, the result of the current study shows that constructs are theoretically related.

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Table 3: factor correlation *matrix*

Factor	**PBC**	**ATT**	**SNO**	**BHV**	**GOV**	**INT**
PBC	1.000					
ATT	.552	1.000				
SNO	.476	.521	1.000			
WBC	.478	.475	.396	1.000		
GOV	.560	.551	.469	.547	1.000	
INT	.570	.546	.482	.443	.520	1.000

We also conducting a reliability test since it is important as it measures the consistency of all parts of a measuring instrument. Cronbach Alpha is a very common test used to measure the internal consistency of the questionnaire. It most agreed that the minimum value of the internal consistency of .70. Table 4 below demonstrates the reliability of our data in values. It is clearly seen that Cronbach alpha is much higher than .70, the value located between .86 and .91. This result reflects consistency and a high degree of free measurement errors.

Table 4: reliability of data

Variable	**Cronbach's alpha value**
1. Perceived Behavioral Control	.91
2. Attitude	.90
3. Subjective Norms	.94
4. Water Consumption Behavior	.88
5. Governmental Regulations	.88
6. Intention	.86
7. Total	.93

Confirmatory factor analysis

confirmatory factor analysis test was used to diagnose the proposed TPB factors. Parameter estimation was based on (Kline,2010). Model fit was estimated according to the following standards: Chi-Square test (X^2), RMSEA, GFI, and CFI tests. Normal Chi-square (/df) <=3.0, 90 and root mean square approximation (RMSEA) <=0.05, and goodness of fit index (GFI) >0.95. The model fit test showed that the value of CFI = 0.99, X^2/df = 1.56, GFI= 0.99 *(see table 5*). As a result, all the goodness of fit tests were above the acceptable level indicating that the model has a good fit. The results for the model are specified in Table 5. The associated model fit indices meet the criteria specified (/df=1.56; GFI=0.99; CFI=0.99; and RMSEA=0.01).

Table 5: model fitness

Test	**Value**	**Acceptable values**
X^2/DF	1.56	≤ 3
RMSEA	0.01	< 0.05
GFI	0.99	≥ 0.95
CFI	0.99	≥ 0.95

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Regarding discriminant validity, AVE values should exceed the values of ASV & MSV (Hair et al., 2010). Also, the values of AVE are higher than 0.5 that indicates convergent validity. Finally, all CR values are higher than 0.7 meaning that the model is reliable. Table (6) showed that the results values of the tests are in line with the recommended values.

Table 6: Convergent *&discriminant validity and reliability*

	CR	**AVE**	**MSV**	**MaxR(H)**	**GOV**	**PBC**	**ATT**	**SNO**	**BHV**	**INT**
GOV	0.889	0.728	0.329	0.889	**0.853**					
PBC	0.917	0.735	0.340	0.917	0.574	**0.857**				
ATT	0.905	0.704	0.318	0.905	0.564	0.563	**0.839**			
SNO	0.942	0.845	0.280	0.943	0.480	0.484	0.529	**0.919**		
BHV	0.884	0.717	0.312	0.884	0.559	0.487	0.483	0.400	**0.847**	
INT	0.869	0.688	0.340	0.869	0.535	0.583	0.558	0.492	0.452	**0.830**

Note: CR: Composite reliability/ AVE: Average Variance Extracted /MSV: Maximum Shared Variance/ ASV: Average Shared Variance

HYPOTHESES TESTING

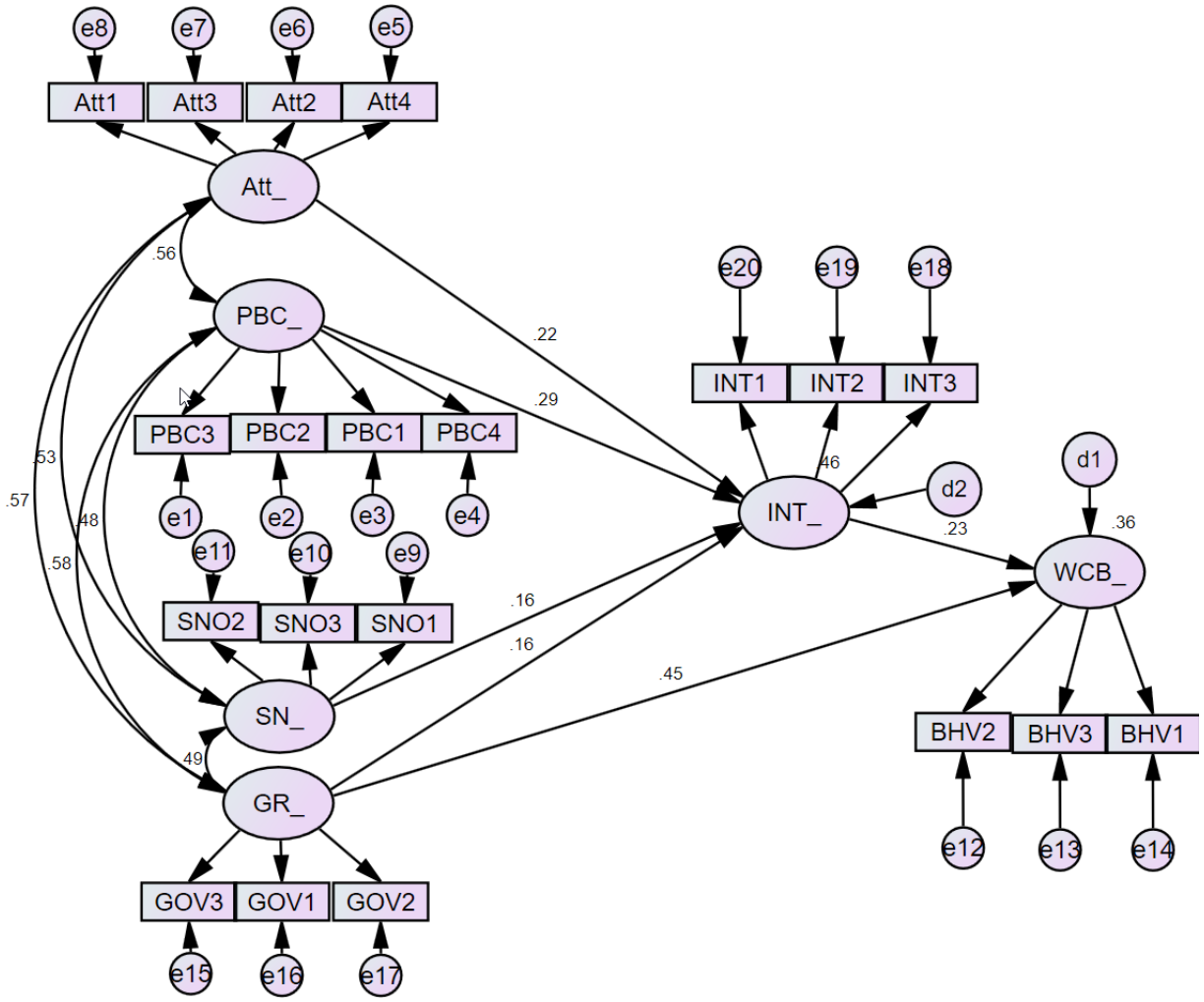

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Figure 1: theoretical framework

After guaranteeing all conditions to test the hypotheses are met. The researchers test the hypotheses *(see table7)* and find out that the first hypothesis was supported. "Attitude (β= .293, p<0.001) ,"subjective norms" (β= .129, p<0.001), "perceived behavioral control", "governmental regulations", (β= .159, p<0.001) are positively and significantly affecting "intention". Thus, H1, H2, H3, and H4 were supported. Moreover, perceived behavioral control has the most effect on respondents' intention to reduce water waste. Besides, the value of R^2 for intention is 0.46. Thereafter, "Governmental regulations" (β= .45, p<0.001), and "intention" (β= .228, p<0.001) are positively and significantly affecting "water consumption behavior" Thus, Hypotheses H5 and H6 were supported. The R^2 value for consumption behavior is 0.36.

Table 7: Testing hypothesis

	Hypothesis			β	**C.R.**	**P**	**Supported**
H1	Attitude	→	Intention	.223	8.48	***	√
H2	Subjective norms	→	Intention	.159	6.93	***	√
H3	Perceived behavioral control	→	Intention	.293	11.38	***	√
H4	Governmental regulations	→	Intention	.159	6.07	***	√
H5	Governmental regulations	→	Water consumption behavior	.450	17.7	***	√
H6	intention	→	Water Consumption behavior	.228	9.17	***	√

*** $p \leq 0.001$

Discussions

This paper reports an explanation of reducing water consumption practices in Jordan among comprehensive social marketing campaigns. The purpose of this paper was to test the use and efficacy of the TPB in explaining reducing water consumption. As hypothesized, the extension of TPB was a good fit for predicting reduce water consumption behavior. Results revealed that attitude, subjective norm, perceived behavioral control and government rules and regulations predicted intention. And intention, as well as regulations, positively influences behavior.

Given that TPB is a highly cited and accepted model that explains behavior change, this validates the findings in this paper. By expanding the TPB with new constructs (governmental rules and regulations) the explanatory power of the model was improved, and all constructs reported a statistically significant predictor of behavioral intentions. Consequently, the inclusion of governmental rules regulations reported statistically and fundamentally improves the model. Therefore, despite its influence and extensive application in behavior change research (Armitage & Christian, 2003; Sommer, 2011), the findings here indicate the importance of modifying the TPB based upon its components and highlight the key driver of behavior change for reducing water consumption.

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Received 20 May 2021; Accepted 25 May 2021.

Three constructs that significantly influence intention to reduce water consumption; attitude, subjective norms, and perceived behavior control were evidenced. Consistent with previous TPB research (Lowe et al., 2015), the results suggested that attitudes affect intentions to reduce water use. As such, policymakers or campaigners must emphasize changing consumer attitudes towards consuming water. So, voluntary approaches to behavior change are likely to contribute to the long and lasting result. Further, social norms were shown to influence behavioral intentions, this finding highlights the importance of positive support in engaging individuals within a social structure. This support could have occurred in the form of impetus and expectations that communicated by friends, peers, family members, and neighbors. Subjective norms are documented as a powerful strategy that promotes behavior change within target audiences (Chaudhary & Warner, 2015; McKenzie-Mohr, 2011). Campaigners and policymakers are recommended to build plans and strategies to enhance people's awareness of their peers' engagement
in household and water consumption practices (McKenzie-Mohr, 2011). This act can be achieved in several ways, for example, educational materials could deliver a clear statement of how individuals are already engaging in a certain desired behavior comparing to peers or neighbors. Also, community collaboration with a local leader to promote reducing water consumption can be a helpful approach (Blaine, Clayton, Robbins, & Grewal, 2012). The impact of social norms on behavior is very highly accepted, recent studies highlighted the fact that people are mostly unaware of its influence upon them (McKenzie-Mohr, 2011), and as such communications which make social norms more noticeable are an important behavior change advantage.

As predicted, perceived behavioral control was another concept that suggestively predicted an individual's intention to reduce water use. people who controlled over their behaviors are more likely to reduce water consumption behavior. consequently, practitioners and campaigners are recommended to categorize factors that lead to low perceived behavioral control and build strategies that enhance people's ability to increase self-efficacy. Further, perceived behavioral control can be enlarged by assisting individuals in increasing skills needed to adopt specific water practices, eliminating perceived barriers of adoption of the desired behavior, which is a key feature of the social marketing program. Regarding intention, the current study showed that individuals' intentions are positively and significantly connected to reduce water consumption behaviors. This result is supported by many studies suggesting that intention involves a strong tendency to behave (Ajzen, 1998). As a general agreement, the stronger intention of people to involve in behavior, the more likely to performs that behavior (Ajzen, 2011; Conner, 2020; Terry, Hogg, & White, 1999; Webb & Sheeran, 2006).

A major construct associated with water reducing water consumption program was the governmental regulations and restrictions of water use, those restrictions include a higher price for higher consumption, supplying water consumptions once a week, etc. those regulations and policy seem an important construct in influencing people’s consumption decisions, the result showed a significant influence on intention and predicting actual behavior. These results are consistent with social marketing literature suggesting that rules and regulations create a suitable environment that is supportive of behavioral change (Andreasen, 2006). Prior literature examined the impact of applying rules and regulations within the social marketing field as evidenced in different contexts including limiting alcohol and cigarette consumption (Cherrier & Gurrieri, 2014; Hassan, Walsh, Shiu, Hastings, & Harris, 2007), limiting product use in public spaces (Moore, Shepherd, Perham, & Cusens, 2007), waste reduction, increases in recycling and healthy

Annals of R.S.C.B., ISSN: 1583-6258, Vol. 25, Issue 5, 2021, Pages. 5826 - 5843
Received 20 May 2021; Accepted 25 May 2021.

eating ((Thomas & Sharp, 2013), water fluoridation, and policies on substance misuse in schools (Stead, Hastings, & McDermott, 2007).

Implications

The findings of this study provide a conceptual framework and in-depth understanding of the significant drivers of reducing water consumption behavior. Precisely, the findings provide evidence of the important role played by social marketing interventions in influencing attitudes, subjective norms, and perceived behavioral control, the important act played by constructs such as attitudes, subjective norms, and perceived behavioral control in supporting the traditional TPB in this context, and the consequence of the government regulations (as a new factor added in this study) of influencing the intention and the actual behavior (behavior change) of reducing water consumptions. Further, the current study also contributes to the literature of social marketing by demonstrating the features of voluntary behavior change concerning reducing water consumption and highlights the impact of social marketing in offering a solution to social issues.

The current findings are aligned with present research, which has also found support for the utility of the TPB in predicting various behaviors, such as Waste Disposal Behaviour (Tweneboah-Koduah, Adams, & Nyarku, 2020), physical activities (Tweneboah-Koduah, Adams, & Acheampong, 2019), improve healthy dietary decisions(Tweneboah-Koduah et al., 2019). However, the contribution of current research is to demonstrate the predictive ability of TPB concerning reducing water consumption within the social marketing context and the impact of rules and regulations as a new dimension, to date, has remained relatively unstudied. A key finding of interest was the support for the role of governmental rules and regulations in influencing intention to behave as well as actual behavior. Ajzen (1991) suggested that the TPB is open to expansion, and added new constructs may improve the explanatory power of prediction of intentions or actual behavior of the traditional variables of the TPB. This study indicates that governmental rules and regulations could be capable of expanding and improving its aspects.

Furthermore, this study has important implications for practitioners targeting the Jordan population as it helps program planners to be more accurate and have an in-depth understanding when determining what predictors of reducing water consumption behavior. Using specific behavior change techniques that target intention, perceived behavioral control, and norms strength planning and goal setting. As a result, interventions could be able to successfully improve the desired behavior.

Conclusion

A social marketing program has the potential to be a highly effective method in reducing water consumption behavior. However, in this case, the social marketing technique was supported by another construct including government regulations and restrictions. The program was not a pure voluntarist tactic, but created a relatively comprehensive social marketing approach, according to highly accepted definitions from the literature (Andreasen, 2006). Indeed, one of our conclusions is that the probability of success for a campaign to change attitudes, social norms, perceived behavior control is increased with some support from structuralist tools (such as government regulations and restrictions).

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Limitations and Future Studies

This study has few limitations, the generalizability of this research could be limited to the population of interest. This study was undertaken in a scarcity of water in Jordan, and the context does restrict the ability to generalize the results from this study to other areas that have different social, cultural, and environmental characteristics. Nevertheless, context-specific work is significant to further develop an understanding of theory, which can be validated and replicated in other contexts. This offers the opportunity for future researchers to examine the replicability of this study's results in different contexts by evaluating the influence of location and time.

Despite the widespread use of the TPB, other suggested variables that have been used in extending TPB such as respondents' environmental restrictions and individual knowledge and skills. Thus, future research could examine reducing water consumption decisions using extra variables, this may help to enlarge our explanation of behavior.

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