Social Marketing Quarterly
2022, Vol. 28(2) 169–183

DOI: 10.1177/15245004221097802
journals.sagepub.com/home/smq
SAGE

Using Social Marketing to Demystify the Myths Surrounding Covid-19 Vaccination: The Mediating Role of Important Others

Isaac Sewornu Coffie[1], Atsu Nkukpornu[2], William Adomako Kankam[3], and Chosniel Elikem Ocloo[4]

Abstract

Background: The misconceptions and conspiracy theories against the Covid-19 vaccines have been identified as potential factors that could negatively impact herd immunity for the Covid-19 vaccination.

Focus of the article: From the perspectives of the Health Belief Model and the Theory of Planned Behavior, the study sought to determine an effective social marketing intervention to address the misconceptions about the Covid-19 vaccines.

Research Hypotheses: The hypotheses stipulate that perceived susceptibility, perceived severity, perceived benefit, and perceived barriers of the coronavirus will positively influence Covid-19 vaccination behavior. The study further hypothesized that subjective norms (important others) would significantly mediate the relationships.

Methods: Structured questionnaires were used to collect data from 821 individuals from three administrative regions, which constitutes 65% of the population of Ghana. The quota and convenience sampling technique was used in selecting the respondents due to the lack of a sampling frame.

Results: The study's findings show that only perceived susceptibility and the perceived barrier directly influence the Covid-19 vaccination behavior. The result, however, shows a significant improvement when important others were introduced as a mediating variable. Thus, all four constructs had a positive and significant influence on Covid-19 vaccination behavior through subjective norm (important others) as an intervening variable. The study shows the value of using

[1]Department of Marketing and Entrepreneurship, University of Ghana, Ghana
[2]Department of Entrepreneurship and Innovation, Cape Coast Technical University, Ghana
[3]Department of Marketing, Cape Coast Technical University, Ghana
[4]Department of Marketing, Accra Technical University, Ghana

Corresponding Author:
Isaac Sewornu Coffie, Department of Marketing and Entrepreneurship, University of Ghana, Box DC 314 Dasnsoman, Accra, Ghana.
Email: icoffie190@gmail.com

opinion leaders as a communication channel in addressing the misperceptions and conspiracy theories against the Covid-19 vaccines.
Recommendation for Research/Practice: To effectively address the misconceptions about the Covid-19 vaccines and improve herd immunity, social marketers should identify key influencers in various communities and cities and use them in promoting the vaccination program. The study examined and found subjective norms (perceived social pressure from important others in society on an individual to perform or not to perform a behavior) as a significant mediator for promoting the Covid-19 vaccination behavior.
Limitations: The current study examined the mediating role of subjective norm and the HBMs' constructs. Future studies could also consider integrating subjective norm as a mediator in other behavioral change theories to predict the target audience's behavior.

Keywords
social marketing, Covid-19, herd immunity, theory of planned behavior, health belief model

Introduction

The outbreak of the Covid-19 pandemic has altered our usual way of life as we know it, which has resulted in an unprecedented global public health and economic crisis. The Covid-19 pandemic has brought untold hardship to the entire world, with millions of lives lost and many businesses losing money and employees (Okereke et al., 2021; Sarkodie & Owusu, 2021). There have been several calls on the scientific community to develop a vaccine to deal with the pandemic and bring life back to normal. Billions of dollars have been invested in vaccine development projects by governments all over the world. For instance, as of December 2020, an amount of €86.5 billion has been invested in vaccine development globally (Health Policy Watch, 2021). As a result of this massive investment, several vaccines (e.g., Pfizer/BioNTech, Janssen, Oxford/AstraZeneca) have been developed and proved as safe and effective at generating an immune response (Loomba et al., 2021).

Despite these developments, there are several misconceptions and misinformation about the coronavirus disease and many conspiracy theories against the acceptance of the Covid-19 vaccines (Romer & Jamieson, 2020; Ullah et al., 2021). Some general misinformation about the Covid-19 pandemic includes the following: Covid-19 is a disease for white people and not black people; the disease only attacks and kill people living in could regions; African Blood is immune to coronavirus; the disease is not real, it is staged; taking alcohol, ginger, garlic and exposing oneself to hot temperatures can prevent or cure Covid-19. These conspiracies and misinformation about the Covid-19 pandemic and possible vaccines are fueled on social media and offline platforms. Some of these include; the 5G mobile network being responsible for the Covid-19 pandemic, the vaccine will change our DNA, and the vaccine containing a microchip, which could control our lives with the 5G network. Others include the vaccine's potential to cause infertility, a bioweapon to wipe out the African content, and that vaccine trial participants have died after taking the vaccination (Cooper et al., 2021; Ullah et al., 2021).

Designing an effective intervention to deal with these negative pieces of information and conspiracy theories against the Covid-19 vaccine is critical to achieving herd immunity. This is particularly important as past studies have shown misinformation and conspiracy theories as a major source of large-scale rejection of vaccination programs, particularly in less developed economies like Ghana (Salmon et al., 2015; Dubé et al., 2013). Recent surveys gauging the preparedness and willingness of people to accept the Covid-19 vaccines presents worrying reports.

For instance, a nationwide survey in Ghana to gauge the potential acceptance of the Covid-19 vaccine reveals that as of April 2021, 46% of Ghanaians had a high-risk perception of acquiring the vaccine (Lamptey et al., 2021). A similar survey in South Africa also shows a high hesitancy of acquiring the vaccine (Cooper et al., 2021). Similar worrying reports were received from other parts of the world. For instance, a report by Tyson et al. (2021) reveals that as of April 2021, 49% of US adults are still not prepared to get vaccinated, mainly due to some conspiracies and concerns about side effects. This was a sharp fall from 72% of US adults who were willing to take the Covid-19 vaccine in June 2020 if the vaccines were available at that time (Reiter et al., 2020). A national survey on Covid-19 vaccine acceptance in Malaysia shows that 95.8% of Malaysians have hesitancy regarding the safety, side effect, and effectiveness of the Covid-19 vaccine.

For the current Covid-19 vaccination program to be successful and achieve herd immunity, at least 55% of the population needs to accept being vaccinated (Knok et al., 2021). In some cases, the estimates are as high as 85%, depending on the country and infection rate (Loomba et al., 2021). However, vaccine hesitancy (a behaviour where people are reluctant or refuse to accept a vaccine despite its availability) is a big issue globally and considered a significant health threat to achieving herd immunity (French et al., 2020; Knok et al., 2021). Thus, to achieve the current vaccination program's success rate, designing an effective intervention is required to change peoples' perception of the vaccine and encourage its acceptability (French et al., 2020). Given the history of vaccine hesitancy worldwide (Ullah et al., 2021) and the current misconceptions and conspiracy theories against the Covid-19 vaccine, effective measures must be taken to achieve herd immunity. As a behavioral change mechanism, and given the history of its success rate, designing an intervention from a social marketing perspective is more likely to produce the required success rate to achieve herd immunity.

Although there is a growing body of research on achieving herd immunity for the Covid-19 vaccination program (Cooper et al., 2021; Rahi & Sharma, 2020; Ullah et al., 2021), limited studies have looked at the issue from a behavioral change perspective. From the social marketing perspective, the current study contributes to knowledge by developing a framework for designing effective interventions that seek to encourage people to take the Covid-19 vaccine using the theory of planned behavior (TPB) and the health belief model (HBM). Using theories to predict and understand behavior (i.e., understanding why people behave the way they do) is important in the social marketing field (Luca & Suggs, 2013). Despite the importance of theories in social marketing, the works of Rundle-Thiele et al. (2019) Luca and Suggs (2013) show limited utilization of theories by social marketers. The current study uses the HBM and TPB to further enhance the social marketing field to understand how the conspiracy theories against the Covid-19 vaccination could be addressed to achieve the vaccination program's success. The remainder of the paper is structured as follows:

- review of the literature;
- theoretical perspectives and hypotheses development;
- methodology;
- results; and discussion
- implications for theory and practice
- limitations and future research direction.

Literature review

As of mid-February 2021, the Pfizer-BioNTech, the Modena, and the AstraZeneca/Oxford Covid-19 vaccines have been approved by WHO as safe for the global vaccination program. Nevertheless, hesitancy to the vaccines promises to be a significant impediment or stumbling block in

achieving herd immunity. As stated earlier, this is mainly due to the conspiracy theories and negative information about the safety and intention of the Covid-19 vaccination program. Past studies on vaccine hesitancy suggest that factors influencing vaccine hesitancy are multifaceted, involving individuals' beliefs about the severity and lack of trust in vaccine's efficacy, governments or pharmaceutical companies (Knok et al., 2021; Dubé et al., 2013; Salmon et al., 2015). The review of the extant literature shows that previous scholars and efforts to improve vaccine acceptance and uptake have mainly focused on awareness, public health education, sources of vaccine hesitancy, and strategies to address vaccine hesitancy (Dubé et al., 2013, 2015; Salmon et al., 2015).

Despite these efforts, vaccine hesitance continues to be a significant health issue globally, with WHO declaring it a health threat in 2019 (Knok et al., 2021). This is an important indication that there is a need to identify other strategies to promote vaccine acceptance and uptake. To the best of our knowledge, what is lacking in the literature is behavioral change initiatives from the perspective of social marketing, which deals with the application of commercial marketing principles to change behavior or encourage the adoption of new behavior. Using the Covid-19 vaccination program as a case, we seek to contribute to the literature by providing a framework from a social marketing perspective using HBM and TPB to encourage vaccine acceptance. Understanding the behavior (why people behave the way they do) is vital to designing an effective behavioral change intervention. Thus, these two theories were used to predict or explain the phenomenon under study. Based on the findings, the 4ps of the marketing mix (Product, Price, Promotion, and Place) were used to proffer practical solutions for both practitioners and policymakers.

Theoretical perspectives

The study uses the HBM and TPB to predict the willingness of the target audience to take the Covid-19 vaccine. The HBM postulate that the willingness of individuals to accept a health-related behavior is dependent on the individual's belief and perception about four major constructs – susceptibility, perceived severity, perceived benefits, and barriers that could hinder or prevent people from taking action to perform the desired behavior (Sulat et al., 2018; Tajeri Moghadam et al., 2020). When people believe or feel that they are vulnerable to attracting a dangerous disease or condition (susceptible to a condition), which could have a damming consequence on their health (perceived severity), they are likely to accept a recommended solution. Likewise, when people perceive that the benefits of performing the recommended behavior outweigh the negatives or associated barriers, the probability that they will take a step to perform the proposed behavior is higher (Tweneboah-Koduah, 2018). In other words, if people perceive the coronavirus to be a dangerous disease which if contracted, will have a damming impact on their health and finances, they are more likely to accept the intake of the Covid-19 vaccine. For the current study, the perceived barrier is operationalized as the misconceptions and conspiracy theories concerning the Covid-19 vaccine. From the HBM's perspective, the findings of Tweneboah-Koduah (2018) show that Ghanaian women were more willing to perform breast self-examination (BSE) when they perceived susceptibility and severity of the breast cancer disease and the benefits of performing the BSE. The work of Obirikorang et al. (2018) also shows lack of susceptibility and severity as the significant predictors of noncompliance to antihypertensive therapy among hypertensive patients in Ghana. The authors, therefore, theorize that for the Covid-19 vaccination program to succeed, these perceived barriers should be effectively dealt with or removed. Again, for an effective intervention seeking to encourage the uptake of the Covid-19 vaccine, it must project the coronavirus disease as a very severe illness with alarming consequences. Additionally, the benefits of performing the behavior (the product) should be highly projected above the perceived cost or

barriers (price) associated with taking the vaccine. Based on these discussions, we proposed the following hypotheses.
H1a: perceived susceptibility to the Covid-19 disease will significantly influence people to take the Covid-19 vaccine.
H2b: perceived susceptibility has a positive connection with subjective norm.
H1b: perceived severity of the Covid-19 pandemic will significantly influence people to take the Covid-19 vaccine.
H2b: there is a positive association between perceived severity and subjective norm.
H1c: perceived benefits of taking the Covid-19 will significantly influence behaviour to take the Covid-19 vaccine.
H2c: there is a positive link between perceived benefit and subjective norm.
H1d: perceived barriers to taking the Covid-19 vaccine will significantly influence willingness to accept the Covid-19 vaccine.
H2d: the relationship between perceived barriers and subjective norm will be positive and significant.

The mediating role of subjective norm

According to the theory of planned behavior (TPB), subjective norm (SN) represents a perceived social pressure to perform or not to perform a behavior (Ajzen, 1985). The individual is under pressure to conform to what important people in his life think is acceptable. Thus, an individual is most likely to perform a given behavior if he believes that the people he respects the most or look up to want him to perform that behavior. Similarly, he is much likely not to perform the behavior in question if he believes that the referents think he should not perform the behavior. These referent people could be religious leaders, professionals, politicians, traditional leaders, and people considered role models in society (Catalan-Matamoros & Elías, 2020; Nwaze & Mohammed, 2013; Tweneboah-Koduah et al., 2020). In this case, if the individual believes that the referents think that taking the Covid-19 vaccine is good, he is most likely to comply with the vaccination program, and the reverse is true. Past studies have shown that subjective norm plays a vital role in influencing behavior (Walker, 2015; Kautonen et al., 2013; Tweneboah-Koduah et al., 2019). For instance, the work of Tweneboah-Koduah et al. (2019) found subjective norm to be the most significant predictor of physical activity behavior among Ghanaian youth. Nwaze and Mohammed (2013) provide evidence on the effectiveness of subjective norms on how the engagement of traditional and religious leaders as strategic stakeholders helped achieve a polio-free status in Nigeria. The findings of Dror et al. (2020) confirm that Israeli health workers' skepticism about the safety of possible Covid-19 vaccine directly impacted negative public perception and unwillingness to take the Covid-19 vaccine.

We theorize that for effective improvement in vaccination programs to achieve herd immunity, particularly for the current Covid-19 vaccination program, important others (subjective norms) will play a significant role. Thus, if people believe that important people in society want them to take the Covid-19 vaccine, they will be more willing to accept it. The key identifiable referents in the case of Covid-19 could be religious leaders, health professionals, journalists, political leaders, and local leaders (Catalan-Matamoros & Elías, 2020). The words of these people will play a significant role in the success or failure of the vaccination program. The work of Gichuru et al. (2018) and Adedini et al. (2018) in Kenya and Nigeria, respectively, shows religious leaders as very influential people in Africa. The work of Kestenbaum and Feemster (2015) have also shown health professionals, particularly those with expertise in vaccines are essential promoters of vaccine acceptance. We further postulate that communicating the constructs of the HBM through

important others will have a more profound impact on influencing behavior towards the vaccination program. The following hypotheses were developed based on the above discussions.
H3a: SN mediates the relationship between perceived susceptibility and Covid-19 vaccination behaviour
H3b: SN significantly mediate the relationship between perceived severity and Covid-19 vaccination
H3c: SN mediates the relationship between perceived benefit and Covid-19 vaccination behaviour
H3d: SN mediates the relationship between perceived barriers and Covid-19 vaccination behaviour
H3e: SN significantly influences Covid-19 vaccination behaviour.

Methodology

The study is a cross-survey that uses a quantitative research approach to test the hypothesized paths in the study. The study used a self-administered structured questionnaire to collect data from the respondents, which were selected from capital cities of three administrative regions of Ghana (Greater Accra, Ashanti, and Eastern region). These regions were purposively selected since, according to the Ghana Statistical Service, they constitute the largest regions of Ghana in terms of population density (65%) (GSS, 2020). Due to the lack of a sampling frame, the convenience sampling technique was deemed appropriate in this case. This approach was used by Tweneboah-Koduah et al. (2020) to predict Ghanaians' waste management behavior where there was a lack of sampling frame. The questionnaires were distributed to people in churches, market places, shopping malls, and bus terminals in each city. The respondents were assured of their anonymity and verbally consented to participate in the survey. Using the quota system, 40% of the respondents were selected in the Ashanti Region, with 35% and 25% from Greater Accra and Eastern Regions respectively. Two weeks were spent in each region for data collection.

Following Wolf et al.(2013)'s sample size determination approach (2013), a sample size of 1250 was arrived at. A total number of 1500 questionnaires were, however, distributed to make room for a non-response rate. At the end of the data collection period, 967 completed questionnaires were received, making a response rate of 64.5%. However, a total of 821 was used for further analysis after eliminating incomplete responses. Figure 1.

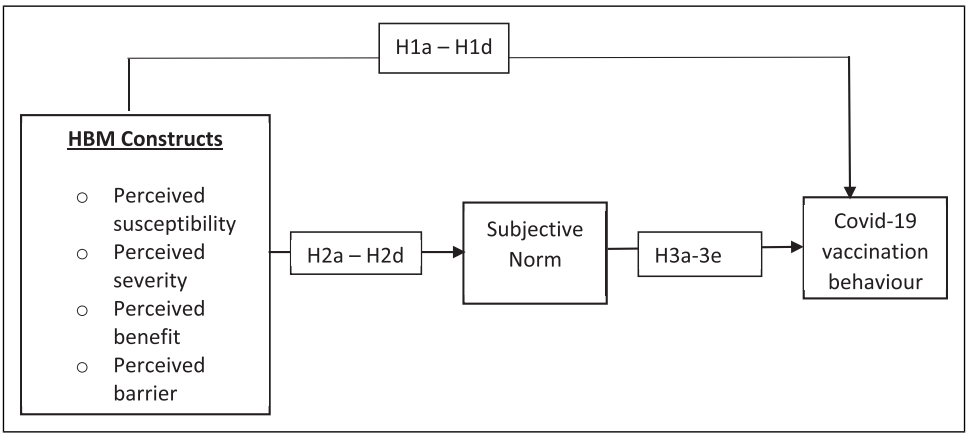

Figure 1. Conceptual framework.

The measurement items were adapted from the literature to suit the context of the current study. The items measuring perceived susceptibility were adapted from (Deshpande et al., 2009; Tweneboah-Koduah, 2018). Perceived severity, perceived benefits, and barriers were measured using 5, 6, and 4 items, respectively. These items were adapted from Razmara et al. (2018) and D'Souza et al. (2011). Subjective norm was measured using five items adapted from (Tweneboah-Koduah et al., 2019). The items were measured on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Before administering the questionnaires, we pilot tested them with 50 people in Accra to ensure clarity and better comprehension of the questions.

The data was analyzed using SmartPLS-SEM. The two-step approach recommended for structural equation modeling was followed (Anderson & Gerbing, 1988). First, the measurement model was assessed, followed by the analysis of the structural model.

Data analysis and results

The measurement model was first tested to ascertain the validity and reliability of the constructs. An examination of the structural model followed this to assess the hypothesized relationships. The measurement and structural model were analyzed using partial least squares structural equation modeling (PLS-SEM).

To assess the extent to which the measurement scales measures the latent variables (reliability of the scales), three indices, namely, factor loadings, Cronbach's Alpha (α), and composite reliability (CR), were used. The validity of the constructs (uniqueness of the measurement items) was determined using average variance extract (AVE). As displayed in Table 1, the factor loadings of all the items are above the recommended 0.5 thresholds. The result further shows that all the measurement items have passed the recommended thresholds of $\alpha > 0.7$, $CR > 0.7$, and $AVE > 0.5$ (see Table 1). Thus, the validity and reliability of the measurement items were achieved.

The distinctiveness of the measurement items (discriminant validity) was assessed using Fornell and Larcker's (1981) approach. As shown in Table 2, the square root of the AVEs is greater than the correlation coefficients between the respective constructs, suggesting that discriminant validity was achieved.

Assessment of the structural model

After achieving the validity and reliability of the measurement items, the structural model was assessed. The structural model represents the predictive ability of a study's framework and the significance of the paths hypothesized in the framework. The predictive ability is determined by the R2 value, while the significant paths are determined by the *p*-values (Sarstedt et al., 2017).

The results in Figure 2 show that the dependent variables and the mediator variable directly explained 42.5% of the vaccination behavior of the target audience. Thus, the model moderately predicted vaccination behavior (Sarstedt et al., 2017; Ahmad et al., 2020). The results in Table 3 further indicate that the direct hypothesized path between perceived susceptibility of the Covid-19 pandemic and willingness to get vaccinated was statistically positive and significant ($\beta = 2.226$, $t = 2.365$, $p = 0.024$), providing support for hypothesis **H1a**. The results show an insignificant negative relationship between perceived severity and vaccination behavior. Thus, **H1b** was not supported. Additionally, the result indicates no direct significant relationship between perceived benefits of vaccination and vaccination behavior ($\beta = 0.000$, $t = 0.009$, $p = 0.993$), providing no support for **H1c**. The study, however, found support for hypothesis **H1d**, which predicted a positive and significant relationship between perceived barriers and vaccination behavior ($\beta = 0.183$, $t = 2.718$, $p = 0.007$). This suggests that dealing with perceived barriers to the vaccination program will directly influence vaccination behavior. Additionally, the result shows a positive and

Table 1. Reliability and validity of the measurement model.

Construct	Code	Loading	Alpha (α)	CR	AVE
Perceived susceptibility	PSU1	0.968	0.984	0.987	0.940
	PSU2	0.968			
	PSU3	0.971			
	PSU4	0.972			
	PSU5	0.969			
Perceived severity	PSV1	0.959	0.984	0.987	0.927
	PSV2	0.966			
	PSV3	0.970			
	PSV4	0.965			
	PSV5	0.964			
	PSV6	0.952			
Perceived benefit	PBN1	0.943	0.968	0.975	0.887
	PBN2	0.944			
	PBN3	0.948			
	PBN4	0.939			
	PBN5	0.936			
Perceived barrier	PBR1	0.955	0.987	0.989	0.928
	PBR2	0.966			
	PBR3	0.962			
	PBR4	0.965			
	PBR5	0.964			
	PBR6	0.964			
	PBR7	0.969			
Subjective norm	SN1	0.966	0.990	0.991	0.941
	SN2	0.968			
	SN3	0.972			
	SN4	0.970			
	SN5	0.972			
	SN6	0.972			
	SN7	0.971			
Covid-19 vaccination behavior	CBV1	0.948	0.892	0.921	0.701
	CBV2	0.799			
	CBV3	0.710			
	CBV4	0.907			
	CBV5	0.906			

Table 2. Discriminant validity through Fornell and Larcker (1981) criterion.

	CVB	PBN	PBR	PBU	PSV	SN
CVB	**0.837**					
PBN	0.274	**0.942**				
PBR	0.584	0.391	**0.963**			
PSU	0.514	0.381	0.419	**0.970**		
PSV	0.494	0.373	0.411	0.446	**0.963**	
SN	0.343	0.397	0.387	0.587	0.395	**0.970**

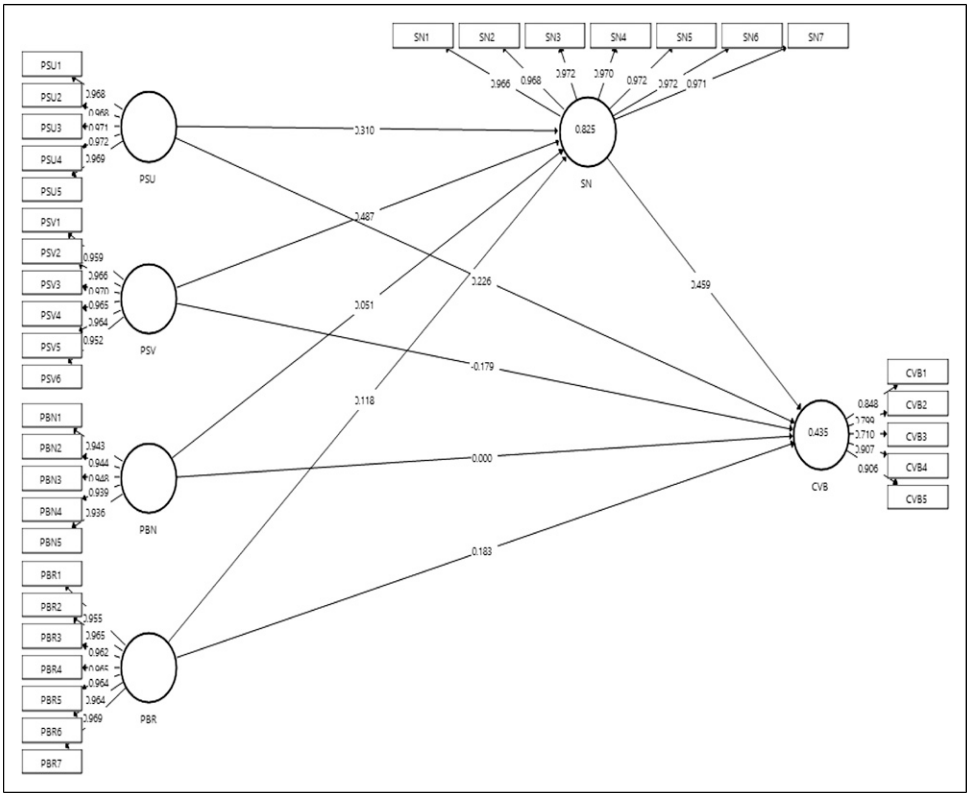

Figure 2. Measurement model.

statistically significant relationship between subjective norm and behavior, providing support for **H3e** (β = 0.459, t = 5.951, p = 0.000). Table 4.

The mediation analysis shows that subjective norm (important others) fully mediate the relationship between perceived severity, perceived benefit and vaccination behaviour. Thus, only the indirect relationships through subjective norm was significant (β = 0.224, t = 4.947, p = 0.000) and (β = 0.024, t = 2.467, p = 0.012). This provides support for **H3b** and **H3c**. The mediation results also show that subjective norm partially mediate the relationships between perceived susceptibility (β = 0.142, t = 3.142, p = 0.002), perceived barrier (β = 0.054, t = 2.426, p = 0.016) and the vaccination behaviour, providing support for **H3a** and **H3d**. Thus, both direct and indirect relationships are statistically significant.

Discussions

From the perspective of the health belief model, the study sought to examine the role of social marketing in addressing the myths surrounding the Covid-19 vaccination, focusing on important others as a mediating variable. The direct hypothesized relationships show a significant positive relationship between perceived susceptibility and willingness to get vaccinated. This is an indication that the perceived vulnerability of the coronavirus will have a significant direct influence on the target audience's willingness to seek vaccination against the virus. This supports the findings of Tweneboah-Koduah (2018), who also found a positive relationship between

Table 3. Direct hypothesized paths.

Hypothesis	Hypothesized Relationships	β	t-statistics	*p*-Value	Decision
H1a	Susceptibility behaviour	2.226	2.265	0.024	Supported
H1b	Severity behaviour	−0.179	1.530	0.127	Rejected
H1c	Perceived benefit behaviour	0.000	0.009	0.993	Rejected
H1d	Perceived barrier behaviour	0.183	2.718	0.007	Supported
H2a	Susceptibility subjective norm	0.310	4.034	0.000	Supported
H2b	Severity subjective norm	0.487	6.727	0.000	Supported
H2c	Perceived benefit subjective norm	0.051	2.745	0.006	Supported
H2d	Perceived barrier subjective norm	0.118	2.624	0.009	Supported
H3e	Subjective norm behaviour	0.459	5.951	0.000	Supported

Note. ***Significant at 0.01, ** Significant at 0.05, *Significant at 0.10.

Table 4. Mediation analysis.

Hypotheses	Relational Paths	β	t-statistics	*p*-value	Decision
H3a	Susceptibility -> SN -> behaviour	0.142	3.142	0.002	Partial mediation
H3b	Severity -> SN -> behaviour	0.224	4.947	0.000	Full mediation
H3c	Benefit -> SN -> behaviour	0.024	2.467	0.012	Full mediation
H3d	Barrier -> SN -> behaviour	0.054	2.426	0.016	Partial mediation

Note. SN = subjective norm; ***Significant at 0.01, ** Significant at 0.05, *Significant at 0.10.

susceptibility and breast screening behavior. Thus, perception of vulnerability has a direct influence on vaccination behavior.

Additionally, the result shows a positive, direct, and significant relationship between perceived barriers and performance of the vaccination behavior. This is consistent with past studies that found a significant relationship between removing barriers and performance of behavior (Moghadam et al., 2020; Sulat et al., 2018; Rundle-thiele et al., 2017). For instance, the work of Rundle-thiele et al. (2017) shows that consumers with low perceived barriers to exercise are more likely to engage in physical activity than those with high perceived barriers. This suggests that dealing with the perceived myths about the coronavirus vaccines will significantly improve target audiences' willingness to take the vaccine. The current study shows that removing perceived misconceptions about the vaccination will significantly improve the performance of the vaccination behavior. The study's result further shows that dealing with the misconceptions regarding the Covid-19 vaccines through important others (opinion leaders) will be an effective means of increasing willingness to get vaccinated.

In this study, we hypothesized that projecting the severity of the Covid-19 pandemic will significantly influence the target audience vaccination behavior. Interestingly, in contradiction to past studies (Moghadam et al., 2020; Sulat et al., 2018; Weinstein, 2000), the current study shows insignificant relationship between severity of the coronavirus and willingness to be vaccinated. This could be attributable to the myth suggesting that the coronavirus is not as dangerous as being presented by health professionals and that it could be cured through conventional means. The result suggests that though the target audience may perceive vulnerability of the virus, they may not perceive it to be severe, and thereby, may be reluctant to get vaccinated to protect themselves against the virus. Again, surprisingly, in contrast to past studies (Sulat et al., 2018; Tweneboah-Koduah, 2018; Rundle-thiele et al., 2017), the result shows that the perceived benefit of getting

vaccinated has no significant direct link with the vaccination behavior. These results show that directly focusing on the severity of the Covid-19 pandemic and benefits of getting vaccinated might not yield a significant result or influence people to get vaccinated. However, the result significantly improved when important others (subjective norm) was introduced as an intervening variable. Specifically, both perceived severity and perceived benefit for vaccination became statistically significant through the indirect path of important others (subjective norms). This implies that by using important others (opinion leaders) to explain the dangers of the Covid-19 pandemic and disseminate the benefits of the product (vaccination behavior), consumers (target audience) are more likely to accept the product (get vaccinated). In other words, the target audience in Ghana is more likely to embrace the vaccination program when important others/opinion leaders ask them to do so. This finding is consistent with the findings of previous scholars who found important others as key influencers of behavior, particularly in the Sub-Saharan Africa region (Walker, 2015; Gichuru et al., 2018). For instance, Walker (2015) found that the target audience in Nigeria was more willing to obey Islamic leaders as opinion leaders on child marriage behavior. The findings of Gichuru et al. (2018) also show a positive result when religious leaders in Kenya were engaged to support HIV prevention programs for gays (Men Having Sex with Men). The current study provides evidence to show that engaging opinion leaders for the Covid-19 vaccination program will have a significant positive result.

Implication for theory and practice

The study contributes to knowledge by investigating the role behavioral change approach (social marketing) in addressing the Covid-19 vaccination myths to achieve herd immunity. The study shows that using social marketing will significantly address the conspiracy theories against the Covid-19 vaccination program, thereby, improve herd immunity. The study also contributes to the social marketing literature by integrating subjective norm of the TPB into the health belief model framework. This answer calls for more integrative perspectives in predicting and understanding behavior (Domegan et al., 2016; Truong et al., 2019). The study, therefore, contributes to the social marketing theory building by investing the mediating role of subjective norms between perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and performance of recommended behavior. The study's findings provide evidence to show that conveying the beliefs of the HBM through important others (subjective norm) as a mediator will significantly improve willingness to perform the behavior. Thus, the target audience will be more willing to patronize a recommended behavior (product) if it is promoted by important others revered by the target audiences. Social marketers can consider the significant role of subjective norm as a key mediator variable in designing effective behavioral change campaigns, particularly for the Covid-19 vaccination program.

In the current study, misconceptions and conspiracy theories against the Covid-19 vaccine were operationalized as barriers preventing people from getting vaccinated. A significant relationship was found between perceived barriers and vaccination behavior, suggesting that dealing with these barriers will significantly result in vaccination behavior. The result, however, shows that dealing with these barriers through key influencers yielded a much higher result. This implies that reducing these conspiracy theories and misconceptions will be much more effective if targeted through opinion leaders in various communities.

The path between perceived severity, perceived benefit, and vaccination behavior was fully mediated through the intervening variable of important others (subjective norms). This suggests that promoting the product (vaccination behavior) directly to target consumers will produce little or no significant impact in addressing the myths surrounding the Covid-19 vaccines and the success of the vaccination program. In other words, communicating the severity of the coronavirus

and the benefits of the recommended solution (vaccination) through key identified influencers in society. Thus, social marketers seeking to promote the Covid-19 vaccination should identify key influencers in various communities and cities to use them to promote the vaccination program. These individuals could be first vaccinated to encourage others to do the same.

Limitations and future research direction

The study investigated and found subjective norms as a significant mediator between the constructs of the HBM and Covid-19 vaccination behavior. Future studies should consider examining the mediating role of important others between the HBM and other behaviors. Future studies could also consider integrating subjective norm as a mediator in other behavioral change theories to predict target audiences' behavior. This study's findings are based on cross-sectional data, indicating static correlations among the variables at a specific point in time. To determine the pattern of change and the amount to which important others influence behaviors, future researchers may need to take a longitudinal approach.

Additionally, the current study generically examined the role of important others in influencing the vaccination behaviour without looking at how each referent may influence the behaviour. That is, which important others will influence the vaccination behaviour the most in the Ghanaian context? Will it be traditional leaders, religious leaders, political leaders, health professionals, or journalists that will most influence the target audience's vaccination behaviour? Knowing this will help the effective allocation of resources and most likely have the most significant impact in achieving the desired vaccination goal. Future studies should therefore identify various important others and examine their role in influencing the vaccination behaviour.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Isaac Sewornu Coffie https://orcid.org/0000-0003-4668-6397

References

Adedini, S. A., Babalola, S., Ibeawuchi, C., Omotoso, O., Akiode, A., & Odeku, M. (2018). Role of religious leaders in promoting contraceptive use in Nigeria: Evidence from the Nigerian Urban reproductive health initiative. *Global Health Science and Practice*, *6*(3), 500-514. https://doi.org/10.9745/GHSP-D-18-00135

Ahmad, S., Siddiqui, K. A., & AboAlsamh, H. M. (2020). Family SMEs' survival: the role of owner family and corporate social responsibility. *Journal of Small Business and Enterprise Development*, *27*(2), 281-297. https://doi.org/10.1108/jsbed-12-2019-0406

Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior* (pp. 11-39). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-69746-3_2

Anderson, J. C., & Gerbing, D. W. (1988). Structural Equation Modeling in Practice : A Review and Recommended Two-Step Approach. *Psychological Bulletin*, *103*(3), 411-423.

Catalan-Matamoros, D., & Elías, C. (2020). Vaccine hesitancy in the age of coronavirus and fake news: Analysis of journalistic sources in the Spanish quality press. *International Journal of Environmental Research and Public Health*, *17*(21), 1-15. https://doi.org/10.3390/ijerph17218136

Cooper, S., van Rooyen, H., & Wiysonge, C. S. (2021). COVID-19 vaccine hesitancy in South Africa: how can we maximize uptake of COVID-19 vaccines? *Expert Review of Vaccines*, *20*(8), 921-934.

Deshpande, S., Basil, M. D., & Basil, D. Z. (2009 Apr-Jun). Factors influencing healthy eating habits among college students: An application of the health belief model. *Health Marketing Quarterly*, *26*(2), 145-164. https://doi.org/10.1080/07359680802619834

Domegan, C., McHugh, P., Devaney, M., Duane, S., Hogan, M., Broome, B. J., Layton, R. A., Joyce, J., Mazzonetto, M., & Piwowarczyk, J. (2016). Systems-thinking social marketing: conceptual extensions and empirical investigations. *Journal of Marketing Management*, *32*(11–12), 1123-1144. https://doi.org/10.1080/0267257x.2016.1183697

Dror, A. A., Eisenbach, N., Taiber, S., Morozov, N. G., Mizrachi, M., Zigron, A., Srouji, S., & Sela, E. (2020). Vaccine hesitancy: the next challenge in the fight against COVID-19. *European Journal of Epidemiology*, *35*(8), 775-779. https://doi.org/10.1007/s10654-020-00671-y

D'Souza, C., Zyngier, S., Robinson, P., Schlotterlein, M., & Sullivan-Mort, G. (2011). Health Belief Model: Evaluating Marketing Promotion in a Public Vaccination Program. *Journal of Nonprofit & Public Sector Marketing*, *23*(2), 134-157. https://doi.org/10.1080/10495142.2011.572668

Dubé, E., Gagnon, D., & MacDonald, N. E. (2015). Strategies intended to address vaccine hesitancy: Review of published reviews. *Vaccine*, *33*(34), 4191-4203. https://doi.org/10.1016/j.vaccine.2015.04.041

Dubé, E., Laberge, C., Guay, M., Bramadat, P., Roy, R., & Bettinger, J. (2013). Vaccine hesitancy: An overview. *Human Vaccines and Immunotherapeutics*, *9*(8), 1763-1773. https://doi.org/10.4161/hv.24657

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39.

French, J., Deshpande, S., Evans, W., & Obregon, R. (2020). Key guidelines in developing a pre-emptive COVID-19 vaccination uptake promotion strategy. *International Journal of Environmental Research and Public Health*, *17*(16), 1-14.

Gichuru, E., Kombo, B., Mumba, N., Sariola, S., Sanders, E. J., & van der Elst, E. M. (2018). Engaging religious leaders to support HIV prevention and care for gays, bisexual men, and other men who have sex with men in coastal Kenya. *Critical Public Health*, *28*(3), 294-305. https://doi.org/10.1080/09581596.2018.1447647

GSS (2020). *Ghana demographic and health survey 2020*.

Health Policy Watch, I. (2021). *€93 Billion Spent By Public Sector On COVID Vaccines and Therapeutics in 11 Months*. https://healthpolicy-watch.news/81038-2/

Kautonen, T., Gelderen, M. V, & Tornikoski, E. T. (2013). Predicting entrepreneurial behaviour: a test of the theory of planned behaviour. *Applied Economics*, *45*(6), 607-707. https://doi.org/10.1080/00036846.2011.610750

Kestenbaum, L. A., & Feemster, K. A. (2015). Identifying and addressing vaccine hesitancy. *Pediatric Annals*, *44*(4), e71-e75. https://doi.org/10.3928/00904481-20150410-07

Knok, O. K., Li, K., Wan, I. W., Tang, A., Shan Wong, S. Y., & Lee, S. S. (2021). Influenza vaccine uptake, COVID-19 vaccination intention and vaccine hesitancy among nurses: A survey. *International Journal of Nursing Studies*, *114*(2), 224-241. https://doi.org/10.1016/j.ijnurstu.2020.103854

Lamptey, E., Serwaa, D., & Appiah, A. B. (2021). A nationwide survey of the potential acceptance and determinants of covid-19 vaccines in Ghana. *Clinical and Experimental Vaccine Research*, *10*(2), 183-190.

Loomba, S., de Figueiredo, A., Piatek, S. J., de Graaf, K., & Larson, H. J. (2021). Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA. *Nature Human Behaviour*, *5*(3), 337-348.

Luca, N. R., & Suggs, L. S. (2013). Theory and model use in social marketing health interventions. *Journal of Health Communication*, *18*(1), 20-40. https://doi.org/10.1080/10810730.2012.688243

Nwaze, E., & Mohammed, A. J. (2013). An impact evaluation of the engagement of traditional and religious leaders in the Nigerian polio eradication initiative. *Schorlarly Journal of Medicine*, *3*(5), 53-63.

Obirikorang, Y., Obirikorang, C., Acheampong, E., Odame Anto, E., Gyamfi, D., Philip Segbefia, S., Opoku Boateng, M., Pascal Dapilla, D., Brenya, P. K., Amankwaa, B., Adu, E. A., Nsenbah Batu, E., Gyimah Akwasi, A., & Amoah, B. (2018). Predictors of Noncompliance to Antihypertensive Therapy among Hypertensive Patients Ghana: Application of Health Belief Model. *International Journal of Hypertension*, *2018*(5), 4701097. https://doi.org/10.1155/2018/4701097

Okereke, M., Ukor, N. A., Adebisi, Y. A., Ogunkola, I. O., Iyagbaye, E., Owhor, G., & Lucero-Prisno, D. E. (2021). Impact of COVID-19 on access to healthcare in low- and middle-income countries: Current evidence and future recommendations. *International Journal of Health Planning and Management*, *36*(1), 13-17.

Rahi, M., & Sharma, A. (2020). Mass vaccination against COVID-19 may require replays of the polio vaccination drives. *EClinicalMedicine*, *25*(4), 100501.

Razmara, A., Aghamolaei, T., Madani, A., Hosseini, Z., & Zare, S. (2018). Prediction of safe driving Behaviours based on health belief model: The case of taxi drivers in Bandar Abbas, Iran. *BMC Public Health*, *18*(1), 380-388. https://doi.org/10.1186/s12889-018-5300-5

Reiter, P. L., Pennell, M. L., & Katz, M. L. (2020). Acceptability of a COVID-19 vaccine among adults in the United States: How many people would get vaccinated? *Vaccine*, *38*(42), 6500-6507.

Romer, D., & Jamieson, K. H. (2020). Conspiracy theories as barriers to controlling the spread of COVID-19 in the U.S. *Social Science and Medicine*, *63*(6), 113356.

Rundle-Thiele, S., David, P., Willmott, T., Pang, B., Eagle, L., & Hay, R. (2019). Social marketing theory development goals: an agenda to drive change. *Journal of Marketing Management*, *35*(1–2), 160-181. https://doi.org/10.1080/0267257x.2018.1559871

Rundle-thiele, S., Kubacki, K., & Gruneklee, N. (2017). Perceived benefits and barriers of physical activity : A social marketing formative study. *Health Marketing Quarterly*, *33*(2), 181-194. https://doi.org/10.1080/07359683.2016.1166872

Salmon, D. A., Dudley, M. Z., Glanz, J. M., & Omer, S. B. (2015). Vaccine hesitancy: Causes, consequences, and a call to action. *Vaccine*, *33*(4), D66-D71. https://doi.org/10.1016/j.vaccine.2015.09.035

Sarkodie, S. A., & Owusu, P. A. (2021). Global assessment of environment, health and economic impact of the novel coronavirus (COVID-19). *Environment*. *Development and Sustainability*, *23*(4), 5005-5015.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2017). *Partial least squares structural equation modeling* (7th ed.). Springer International Publishing. https://doi.org/10.1007/978-3-319-05542-8_15-2

Sulat, J. S., Prabandari, Y. S., Sanusi, R., Hapsari, E. D., & Santoso, B. (2018). The validity of health belief model variables in predicting behavioral change: a scoping review. *Health Education*, *118*(6), 499-512. https://doi.org/10.1108/he-05-2018-0027

Tajeri Moghadam, M., Raheli, H., Zarifian, S., & Yazdanpanah, M. (2020). The power of the health belief model (HBM) to predict water demand management : A case study of farmers ' water conservation in Iran. *Journal of Environmental Management*, *263*(4), 110388. https://doi.org/10.1016/j.jenvman.2020.110388

Truong, V. D., Saunders, S. G., & Dong, X. D. (2019). Systems social marketing: a critical appraisal. *Journal of Social Marketing*, *9*(2), 180-203. https://doi.org/10.1108/jsocm-06-2018-0062

Tweneboah-Koduah, E. Y. (2018). Social marketing: Using the health belief model to understand breast cancer protective behaviours among women. *International Journal of Nonprofit and Voluntary Sector Marketing*, *23*(2), 1-7. https://doi.org/10.1002/nvsm.1613

Tweneboah-Koduah, E. Y., Adams, M., & Acheampong, G. (2019). The role of theories in social marketing in predicting physical activity behavior among the youth. *Journal of Social Marketing*, *9*(4), 398-417. https://doi.org/10.1108/jsocm-01-2018-0005

Tweneboah-Koduah, E. Y., Adams, M., & Nyarku, K. M. (2020). Using Theory in Social Marketing to Predict Waste Disposal Behaviour among Households in Ghana. *Journal of African Business*, *21*(1), 62-77. https://doi.org/10.1080/15228916.2019.1597323

Tweneboah-Koduah, E. Y., Mann, V. E., & Adams, M. (2020). Using Motivation, Opportunity, and Ability Model in Social Marketing to Predict "Galamsey" Behavior in Ghana. *Social Marketing Quarterly*, *26*(1), 28-46. https://doi.org/10.1177/1524500419901254

Tyson, A., Johnson, C., & Funk, C. (2021). *U.S. Public Now Divided Over Whether To Get COVID-19 Vaccine*. Pew Research Center.

Ullah, I., Khan, K. S., Tahir, M. J., Ahmed, A., & Harapan, H. (2021). Myths and conspiracy theories on vaccines and COVID-19: Potential effect on global vaccine refusals. *Vacunas*, *22*(2), 93-97.

Walker, J.-A. (2015). Engaging Islamic Opinion Leaders on Child Marriage: Preliminary Results from Pilot Projects in Nigeria. *Review of Faith and International Affairs*, *13*(3), 48-58. https://doi.org/10.1080/15570274.2015.1075760

Weinstein, N. D. (2000). Perceived probability, perceived severity, and health-protective behavior. *Health Psychology*, *19*(1), 65-74. https://doi.org/10.1037//0278-6133.19.1.65

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample Size Requirements for Structural Equation Models: An Evaluation of Power, Bias, and Solution Propriety. *Educational and Psychological Measurement*, *76*(6), 913-934. https://doi.org/10.1177/0013164413495237

Author Biographies

Isaac Sewornu Coffie has completed his PhD in marketing with a specialization in social marketing at the University of Ghana. His teaching and areas of research interest are social marketing, corporate social responsibility and entrepreneurship.

Atsu Nkukpornu is currently a lecturer at the Cape Coast Technical University, Ghana. He has completed his PhD in marketing and entrepreneurship from the University of Ghana. His teaching and research area are entrepreneurship, social marketing and innovation.

William Adomako Kankam is a PhD in Management Science and Engineering from Jiangsu University, China. He is currently a lecturer at the Cape Coast Technical University, Ghana. His teaching and research areas are open innovation, social media marketing and social marketing.

Elikem Chosniel Ocloo holds a PhD in Management Science and Engineering from Jiangsu University, China and is a Senior Lecturer at Accra Technical University, Ghana. He has over ten years of industrial and academic experience and is an Associate Member of the Chartered Institute of Marketing Ghana.