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The moderating influence of celebrity endorsement on intention to engage in infection prevention behaviours

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Abstract

Although the use of celebrities for communication within social marketing to influence voluntary behaviour change has received significant attention, its application to promote infection preventive behaviours, such as frequent handwashing with soap, has received limited attention. Using the health belief model (HBM), the study examined the moderating effect of celebrity endorsement (CE) on the relationship between the predictors of HBM such as perceived severity, susceptibility, benefits, barriers, self-efficacy and target audiences' intention to avoid handshaking, frequently wash hands with soap and cover mouth with an elbow when coughing. Data from 562 respondents were analysed using PLS-SEM. The result shows that CE significantly moderate the relationship between target audiences' perception of severity, susceptibility, self-efficacy and cues to action and intention to perform the recommended infection preventive behaviours. Thus, when a celebrity is employed as a conduit for delivering a social marketing message, particularly about infection preventive behaviour, target audiences are more likely to take action to perform the recommended behaviour. Theoretically, the study shows that although the HBM has been extensively applied to explain health-related behaviours, using celebrities to endorse the various constructs of the HBM significantly enhances the predictive ability of the model.

Keywords: social marketing, infection preventive behaviours, health belief model, celebrity endorsement, health promotion

INTRODUCTION

Despite the significant achievements and advances in the field of medicine, science and sanitation and vaccines, infectious diseases (illnesses caused by harmful microorganisms such as bacteria, fungi, viruses and parasites) continue to be a major source of threat to global health and economic stability (Mohamad Shakir *et al.*, 2020; Chakaya *et al.*, 2021). According to the World Health Organization (WHO, 2023), infectious diseases are responsible for an estimated 9.2 million deaths worldwide each year, accounting for approximately 16% of all deaths. In 2021, for instance, Tuberculosis alone claimed over 1.6 million lives globally and was rated as the second leading infectious killer disease after Covid-19 and HIV/AIDS (WHO, 2023). Since its emergence in late 2019, Covid-19 disease has caused a global pandemic, with over 765,903, 278 confirmed cases and 7 million deaths worldwide as of May 2023 (Statista, 2023). As alluded to by scholars [e.g., (Cabrera-Álvarez *et al.*, 2022; Coccia, 2023)], one of the most important lessons taught by the outbreak of Covid-19 is how to take infection prevention behaviours seriously. With the increasing outbreak of emerging infectious diseases, the importance of infection prevention behaviour has become more crucial

Contribution to Health Promotion

- Educating target audiences about infectious diseases through celebrities will significantly influence their perception and willingness to perform infection preventive behaviours.
- To make infection preventive behaviour viable for target audiences, social marketers/infection-preventionist should focus on the benefits of performing these behaviours.
- Using celebrities will boost target audiences' confidence and self-efficacy to avoid handshaking, sanitise or wash hands frequently with soap.

than ever. Understanding factors that will influence peoples' intention to voluntarily comply with infection prevention behaviours such as frequent handwashing with soap is an important step in helping policymakers and health promoters to design effective interventions to limit the outbreak or spread of infectious diseases (Cabrera-Álvarez *et al.*, 2022).

According to scholars, infectious diseases are transmitted directly or indirectly (Kilpatrick *et al.*, 2018; Shoker *et al.*, 2021). The direct mode of transmission involves direct contact with infectious blood mostly through sexual intercourse or direct contact with the body fluid of an infectious person through kissing. Indirect transmission occurs when a healthy person touches surfaces contaminated by infectious persons through sneezing or coughing and then touch their nose, eyes or mouth. Examples include influenza, cold, coronavirus, stomach flu, norovirus, Ebola, etc.

The focus of the current study is on the indirect infectious diseases. This is because given their mode of transmission, they can largely be prevented through effective infection prevention behaviours (Atkins, 2016). These behaviours include frequent hand washing with soap, avoidance of handshaking, covering mouth with an elbow when coughing, wearing masks and frequently sanitizing hands with alcohol-based sanitizers. By practising infection preventive behaviour, individuals can reduce the likelihood of becoming infected or infecting others (Heo and Jang, 2021; Cabrera-Álvarez *et al.*, 2022). Infection prevention behaviour refers to actions taken by individuals to minimize their risk of contracting or spreading infectious diseases and in this case, indirect infectious diseases (Shoker *et al.*, 2021).

Although several efforts including social marketing efforts have been implemented in the past to improve the adoption of infection prevention behaviours (Van den Broucke, 2020; Greene and Wilson, 2022; Cole, 2023), limited attention has been paid to promoting the behaviour through celebrity endorsement (CE) (Rocha *et al.*, 2020). This notwithstanding its increasing usage in promoting socially desirable products among social marketing practitioners and academics, with studies demonstrating its effectiveness in social marketing campaigns on HIV stigmatization, child abuse and fruit intake among children (García-Conde *et al.*, 2020). Despite the increasing usage and acknowledgement of its effectiveness, past studies examining the CE phenomenon in social context have largely focused on cancer prevention, public service advertising (Chan and Zhang, 2019), HIV prevention (Casais and Proença, 2012), promoting sports and physical activity participation (Behnoosh *et al.*, 2017) with little evidence of its effectiveness in influencing infection prevention behaviour.

Past efforts have largely focused on regulation, enforcement, education and awareness creation (Atkins, 2016; Cho *et al.*, 2022). Communication efforts in the past have also focused largely on using government communication agencies to influence target audiences to perform the behaviour. In Ghana for instance, the Ministry of Information, the National Commission for Civic Education (NCCE) and the communication department of the Ministry of Health are the major means through which Ghanaians are educated and encouraged to perform health safety behaviours, including the recent Covid-19 safety behaviours (Tweneboah-Koduah and Coffie, 2022). In India, the official mouthpiece for communicating infectious disease control is the National Centre for Disease Control (NCDC) (Shoker *et al.*, 2021). However, research has shown that governmental agencies' communication efforts are largely less effective in influencing the performance of recommended behaviours (Lamptey *et al.*, 2021; Okada *et al.*, 2023). For instance, the survey by Ghana Health Service (GHS, 2021) shows a high non-compliance with the safety measures when governmental agencies were responsible for communicating Covid-19 safety behaviours. From the Japanese perspective, the findings of Okada *et al.* (2023) also shows that target audiences have limited trust in governmental agencies as a source of information about Covid-19.

Using the health belief model (HBM), the study examined the moderating effect of CE on the relationships between the various constructs of HBM and target audiences' intention to avoid handshaking, frequently wash hands with soap and cover their mouth with an elbow when coughing. Although the HBM posits that perceived severity, susceptibility, benefits, barriers and self-efficacy are important predictors of health behaviours, past studies examining these variables in the context of infection prevention mostly show

an insignificant relationship, particularly between perceived severity and susceptibility and intention to adhere to the infection prevention behaviours (Luquis and Kensinger, 2019; Guidry *et al.*, 2021; Tweneboah-Koduah and Coffie, 2022). For example, the findings of Guidry et al. (2021) shows that susceptibility and perception of severity of Covid-19 were less impactful in predicting the Covid-19 safety behaviours. The study by Bates *et al.* (2020) also shows that the HBM constructs predicted only 14% of variance in Ecuadorians' intentions to prevent triatomine infection with perceived susceptibility and severity having no significant influence on intention to prevent the disease. From a less developed African country perspective, the findings of Tweneboah-Koduah and Coffie (2022) also shows perceived susceptibility and severity as insignificant predictors of Covid-19 safety behaviours among Ghanaians. The insignificant relationships, particularly between susceptibility, severity and intention to perform infection prevention behaviours suggest that there is a need to examine factors that could moderate the relationship between these variables and intention to perform infection prevention behaviours.

We are of the view that given the level of public interest in celebrities and the love they enjoy, which has made them an authority for various groups, especially young people, they could play a vital interactive role in shaping target audiences' perception about susceptibility and severity of infectious diseases and intention to adopt infection prevention behaviours. Additionally, since promotion is one of the key marketing tool health promoters and social marketers use to influence target audiences to voluntarily adopt a behaviour, endorsing health campaigns by celebrities may play a significant interactive role in influencing target audiences' intention to perform infection prevention behaviour. Furthermore, examining the interactive influence of celebrity endorsement is equally important because as stated earlier, past findings (e.g., Van den Broucke, 2020; Okada *et al.*, 2023; Park *et al.*, 2023) have shown that the current communication efforts by governmental agencies on infection prevention behaviours have little or no significant influence on target audiences' intention to perform those behaviours.

LITERATURE REVIEW

Social marketing as a discipline began in the early 1970s when Kotler and Zaltman (1971) realized that the same marketing principles used to sell products and services could be used to sell behaviours, ideas and attitudes. The concept is defined as the use of marketing principles and techniques to influence target audiences to voluntarily accept, reject, modify or abandon a behaviour for the benefit of individuals, groups, or society as a whole (Andreasen, 1994). Although the key features of social marketing are based on the principles of marketing, its application is unique to social issues. The concept has been applied to varied social issues in different contexts and has been proven as an effective mechanism for changing human behaviour (Rundle-Thiele *et al.*, 2017; Tweneboah-Koduah, 2018). For instance, in the UK, the work of Thomas (2009) demonstrates the effectiveness of Liverpool's social marketing initiative to address obesity. From an emerging economies perspective, the work of Tweneboah-Koduah (2018) provides empirical evidence demonstrating the effectiveness of using social marketing to encourage breast self-examination (BSE) in Ghana. The next sections discuss social marketing mix.

Social marketing mix (Ps)

In social marketing, product refers to the desired behaviour the marketer wants target audiences to adopt or reject, encompassing value propositions or benefits associated with the behaviour change (Coffie *et al.*, 2023; Schartel Dunn and Nisbett, 2020). A critical analysis and understanding of the social product is essential for effective strategy design. In this context, the product involves performing behaviours such as social distancing, avoidance of handshaking, elbow greeting and frequent handwashing with soap. Promotion involves persuasive messages to convince or persuade the target audience to adopt or reject a behaviour for the benefit of the individual or society at large. Price refers to the cost the target audience has to incur to receive or enjoy the benefits of the social product (behaviour), which can be psychological or monetary (Coffie *et al.*, 2023). The lower the perceived cost, the higher the likelihood that target audiences will form an intention to perform the recommended behaviour. Place in social marketing refers to accessibility, where the target audience can easily access the necessary resources to perform the recommended behaviour. In this context, place refers to the availability and easy accessibility of handwashing points in vantage points, particularly in public spaces.

Theoretical background and hypotheses development

The current study is conducted from the HBM perspective to predict or understand the target audience's intention to perform infection prevention behaviours mentioned earlier in the study. The HBM explains that an individual's willingness to perform a health-promoting behaviour is dependent on the individual's beliefs and perception of six major constructs—perceived susceptibility, perceived severity of the health condition, perceived benefits, perceived barriers, self-efficacy and

cues to action (Rosenstock, 1974; Tweneboah-Koduah, 2018; Luquis and Kensinger, 2019). Susceptibility or vulnerability refers to people's perception of their chances of contracting a health problem (in this case, an infectious disease). Perceived severity is the individual's judgement of how dangerous they think it is to contract an infectious disease (Tapera *et al.*, 2019; Yildirim and Kocaağalar Akince, 2022). The higher the condition is perceived to be dangerous, the higher the possibility that target audiences will take step to prevent it. Perceived benefits are rewards an individual expects to receive from performing the recommended health behaviour (i.e. the higher the benefits, the higher individual's preparedness to take action to perform the recommended health behaviour) (Tweneboah-Koduah, 2018). Perceived barriers are obstacles that might prevent people from taking action to perform the desired health behaviour. Thus, the lower the obstacles (perceived or real), the higher the possibility of people taking action to perform the recommended behaviour and vice versa (Luquis *et al.*, 2019). Self-efficacy is the ability to overcome obstacles to performing healthy behaviour. Cues to action are anything that helps in making the threat of a disease more salient. They are external stimuli that prompt individuals to engage in a particular behaviour (Pettinico and Debevec, 2020). In the context of infection prevention behaviours, cues to action can include reminders, prompts or social cues that encourage individuals to take steps to prevent the spread of infectious diseases.

Thus, in the context of infection prevention behaviours, if people feel they have a high chance of contracting an infectious disease (susceptible), they are more likely to engage in the recommended preventive behaviours. If they believe that the condition is very dangerous (perceived severity) to contract but can reduce its impact through the preventive behaviours and that the benefits of observing these behaviours will outweigh the barriers of complying with them, they will be more willing to engage in these preventive behaviours.

The HBM in infection prevention behaviour

Several studies have examined the constructs of the HBM and target audiences' intention to perform the infection prevention behaviour (Guidry et al., 2021; Park and Oh, 2022; Tweneboah-Koduah and Coffie, 2022). Applying the model to understand factors associated with preventive behaviours for Covid-19 among South Korean adolescents, the findings of Park and Oh (2022) reveals lower perception and indirect effect of vulnerability and severity on Covid-19 preventive behaviours. The work of Tweneboah-Koduah and Coffie (2022) also shows that in exception of perceived susceptibility and severity, the remaining constructs of the model had a positive and significant influence intention to wash hand frequently, social distance and avoid handshaking. Twum *et al.* (2021) also found an insignificant relationship between these variables (perceived susceptibility and severity) and target audiences' intention to take the Covid-19 vaccination. In the context of influenza prevention and vaccination among Jordan health workers, the work of Alhalaseh *et al.* (2020) shows an insignificant relationship between perceived susceptibility, severity, cues to action and intention to vaccinate. These findings show that perception of vulnerability and severity, which are two critical variables for intention to perform infection prevention behaviour seems to be low among target audience.

Based on the above discussions, the following hypotheses were developed:

H1: Perceived susceptibility of infectious diseases will have a, positive and significant influence with intention to perform infection preventive behaviours.

H2: Perceived severity of infectious diseases will have a, positive and significant influence with intention to perform infection preventive behaviours.

H3: The perceived benefits of performing infection preventive behaviours will have a positive and significant influence on intention to perform of infection preventive behaviours.

H4: Perceived barriers for engaging in infection preventive behaviours will have a positive and significant influence on intention to perform infection preventive behaviours.

H5: Target audiences' self-efficacy to perform infection preventive behaviours will have a positive and significant influence on intention to perform infection preventive behaviours.

H6: Cues to action will have a direct and significant effect on intention to perform the infection preventive behaviours.

Celebrity endorsement

The use of celebrities in promoting goods and services has evolved into a successful marketing communication tool over the years (Gilal *et al.*, 2020). The term 'celebrity' is widely used to refer to those who are regularly in the public eye and have a high profile, notably in the media, sports and entertainment worlds Appiah-Nimo *et al.*, 2023. (Kamiński *et al.*, 2021; Appiah-Nimo *et al.*, 2023). CE is a marketing strategy where a celebrity is hired to promote a product, service or

behaviour (Zhou and Kraak, 2022). The goal of celebrity endorsement is to leverage on a celebrity's popularity, influence and credibility to increase the awareness and adoption of the promoted product or behaviour (Peterson *et al.*, 2018; Morimoto, 2020; Zhou and Kraak, 2022).

The CE phenomenon has been extensively examined in various context by past studies with findings providing evidence of its effectiveness in influencing purchase behaviour of target customers as a marketing communication tool (Osei-Frimpong *et al.*, 2019; Roy *et al.*, 2021). For instance, the work of Nguyen (2021) shows that though Vietnamese were very sensitive to Chinese products and have 'a mind-set that Chinese products are clones', the use of Son Tung, a young Vietnamese singer as an endorser for a Chinese OPPO phone significantly created a positive attitude and inspiration among young consumers thereby triggering consumer purchase behaviour for the product. In the context of destination marketing, the findings of Roy *et al.* (2021) shows that celebrity endorsement is an effective communication tool that has a significant influence on tourist intention to visit tourist sites. From an emerging market perspective, the work of Osei-Frimpong *et al.* (2019) shows that a celebrity endorser who is perceived as attractive, trustworthy and credible has a positive influence on consumers' purchase intention, perception of quality and loyalty. Given the effectiveness of CE in influencing the intention of target markets, marketers are increasingly adopting the concept in their marketing communication efforts (Gilal *et al.*, 2020; Morimoto, 2020).

Celebrity endorsement in social marketing

According to Casais and Proença (2012) just as celebrities are important agents in marketing, they can also be used to achieve the effectiveness of social marketing campaigns. Past studies that have examined the CE phenomenon in promoting social campaigns demonstrate its effectiveness (Woods *et al.*, 2017; Behnoosh *et al.*, 2017; Schartel Dunn and Nisbett, 2020; Ferrari, 2021). The work of Schartel Dunn and Nisbett (2020) for instance demonstrate that the use of celebrity endorsers in social marketing campaign motivates audiences to action. Their finding further suggest that target audience are more likely to take action to perform a recommended behaviour promoted by a spokesperson they align themselves with. The findings of Ferrari (2021) also shows that using celebrities to educate the public about mental illness led to a reduction in public stigma against mental illness. In comparing the effect of non-celebrity and celebrity endorsement on target audience intention to engage in sports and physical activity, the findings of Behnoosh *et al.* (2017) revealed that campaign by celebrity endorsers had a more positive and favourable result on audience intention compared to non-celebrity endorsers. From a Sub-Saharan African perspective in Ghana, the work of Appiah-Nimo *et al.* (2023) shows that the use of celebrity endorsement in public service advertisements plays a positive and significant role in addressing social issues. As stated earlier in the introduction, despite the increasing usage and acknowledgement of its effectiveness, its application in the context infection prevention behaviours have received limited attention.

There are several ways in which CE can enhance people's intention to perform infection preventive behaviours (Peterson *et al.*, 2018; Gilal *et al.*, 2020; Morimoto, 2020). First, CE can increase the awareness and salience of the behaviour. Celebrities are often seen as role models and trendsetters, and their endorsement can draw attention to the behaviour and its importance. For example, a celebrity avoiding handshake from people and endorsing the elbow-to-elbow greeting may increase the self-efficacy and confidence of target audiences that they can do same. Second, since CEs are often associated with success, fame and positive outcomes, their endorsement can create a positive association between the behaviour and these desirable attributes. For example, when a celebrity endorses the use of hand sanitizer, the followers are likely to associate the use of hand sanitizer to the way famous or successful people behave and can encourage more people to use hand sanitizer. Finally, since celebrities are largely seen as credible and trustworthy individuals, their endorsement can enhance trustworthiness of health messages and relevance of preventive behaviours (Casais, 2012; Macnab and Mukisa, 2019).

Based on the above discussions, the following hypotheses were formulated and depicted in Figure 1.

H7: CE will have a significant moderating effect on the relationship between perceived susceptibility and intention to perform infection preventive behaviour.

H8: CE will significantly moderate the relationship between perceived severity of infectious diseases and intention to perform infection preventive behaviours.

H9: CE will moderate the relationship between perceived benefits of performing infection preventive behaviours and intention to perform infection preventive behaviours.

H10: CE will significantly moderate the relationship between perceived barriers and intention to perform infection preventive behaviours.

H11: CE will significantly moderate the relationship between self-efficacy and intention to perform the infection preventive behaviours.

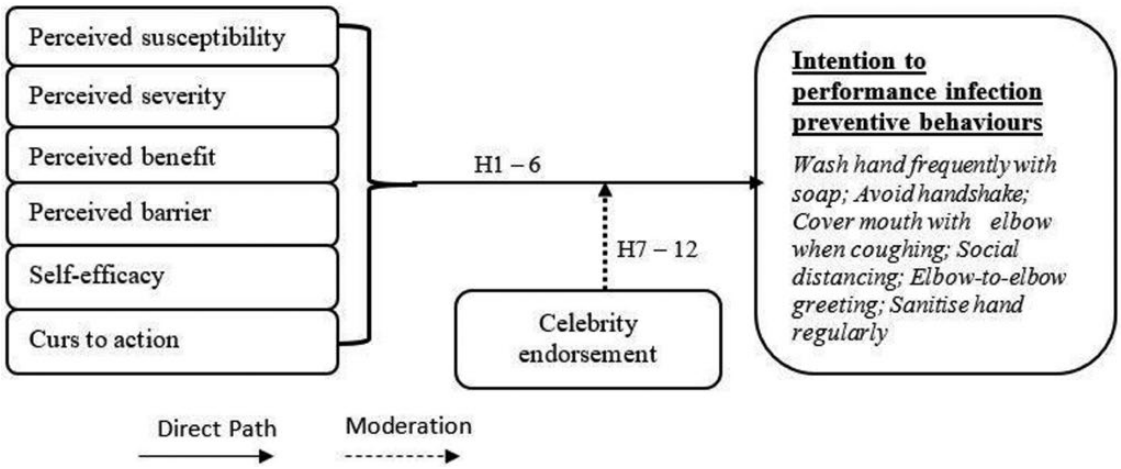

Fig. 1: Conceptual framework.

H12: CE will significantly moderate the relationship between cues to action and intention to perform the infection prevention behaviours.

Methodology

Setting

Two regional capital cities in Ghana (Accra and Kumasi) were purposively selected for the study because according to the Ghana Health Service report (GHS, 2021), these cities have consistently recorded the highest number of infectious diseases since 2018. In each of these cities, the respondents were selected from the central business centre. The central business centres were chosen because they serve as a one-stop shopping place for thousands of people from different economic backgrounds in these cities.

Sample size and sampling technique

Due to the lack of a sampling frame, a convenience sampling technique was used to collect data from the respondents based on their availability and willingness to participate in the survey (Tweneboah-Koduah *et al.*, 2020). According to Kothari (2004) and Taherdoost (2016), though probability sampling techniques are required for quantitative studies, a non-probabilistic approach could be used in situations such as difficulty in assessing a sampling frame. Based on the recommendations of scholars (e.g. Wolf *et al.*, 2013), a sample size of 300 respondents were selected from each of the two cities making a total of 600 sample size for the study. The purpose of the survey was explained to the respondents and were assured of their anonymity. Those who voluntarily opted to participate in the survey were given the questionnaires to answer which takes about 10 to 15 min to complete. At the end of the twelve-week data collection period and screening, a total sample of 562 valid responses were used for the analysis.

Measurement items

Structured questionnaires based on the HBM's constructs were used to collect data from the respondents. The measurement items were adapted from prior research with changes made to them to suit the current study. Perceived severity, susceptibility and perceived barrier were each measured with four items adapted from (Tapera *et al.*, 2019; Moghadam *et al.*, 2020; Tweneboah-Koduah and Coffie, 2022; Yildirim and Kocaağalar Akince, 2022). Perceived benefit and self-efficacy were measured with five items each that were adapted from (Luquis and Kensinger, 2019; Moghadam *et al.*, 2020). The influence of celebrity endorsement was measured with seven items adapted from Cuomo *et al.* (2019); Gilal *et al.* (2020) and Morimoto (2020). The dependent variable (intention to perform infection preventive behaviours such as frequent handwashing, avoid handshaking, social distance) was measured with eight items. See Appendix A for details concerning the measurement items. All the items were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A panel of experts reviewed the items to assess content validity. The content validity index for clarity was 0.81, indicating that the scales have good content validity. The questionnaire was then pilot tested with 50 respondents, and minor revisions were made in the final version based on their feedback. A single

estimation was conducted using Smart PLS-SEM to answer all the research hypotheses.

DATA ANALYSIS AND RESULTS

The two-step approach for structural equation modelling (Anderson and Gerbing, 1988) was followed for the data analysis. First, the reliability and validity of the measurement items was assessed using Average Variance Extract (AVE), Cronbach Alpha (α), Composite Reliability (CR) and factor loadings of the items. Second, the structural model specifying the hypothesized paths was assessed after validity and reliability was achieved.

Measurement model

Four items with factor loadings of less than 0.7 were deleted (PR3, PR4, PB1, PS4). The results in Table 1 shows that reliability and validity of the measurement items was achieved since α, CR and factor loadings of the items were above the recommended 0.7 threshold (Sarstedt *et al.*, 2020). Convergent validity is also achieved as the AVE values were higher than the recommended 0.5 threshold. Discriminant validity (uniqueness of the measurement items in measuring the constructs) was determined using the Fornel and Lacker (1981) criterion.

The structural model

After an acceptable measurement model, the hypothesized paths proposed in the study were tested using PLS-SEM to ascertain the significance of the relationships. First, the predictive ability of the model was assessed using the R^2 values. As explained by Kline (2015), an R^2 value of 0.25 indicates a weak variance explanation, 0.50 a moderate explanation, and 0.7 indicates a high explanation of variance. As shown in Figure 2, the study's model substantially provides 78% of variance in target audiences' intention to perform infection prevention behaviour.

The results of the structural analysis as displayed in Table 2 shows that the proposition in H1, which suggest that the relationship between perceived susceptibility to infectious diseases and target audience intention to perform infection preventive behaviours will be positive and significant was rejected (β = −0.007, t = 0.244, p > .05). Similarly, the proposition in H2 which suggest a positive significant relationship between perceived severity and intention to perform infection prevention behaviours was also rejected (β = 0.011, t = 0.220, p > .05). However, H3 (β = 0.136, t = 3.003, p < .001), H4 (β = −0.054, t = 2.463, p < .001), H5 (β = 0.140, t = 3.320, p < .001) and H6 (β = 0.322, t = 5.979; p < .001) were accepted.

Table 1: Measurement model

Item	Code	Factor loadings	α	CR	AVE
Perceived susceptibility					
	PS1	0.954	0.945	0.965	0.901
	PS2	0.966			
	PS3	0.927			
Perceived Severity					
	PSV1	0.910	0.893	0.925	0.756
	PSV2	0.865			
	PSV3	0.848			
	PSV4	0.854			
Perceived benefit					
	PB2	0.965	0.981	0.986	0.947
	PB3	0.976			
	PB4	0.978			
	PB5	0.974			
Perceived Barrier					
	PBR1	0.950	0.848	0.928	0.866
	PBR2	0.911			
Self-efficacy					
	SE1	0.892	0.939	0.954	0.806
	SE2	0.925			
	SE3	0.928			
	SE4	0.904			
	SE5	0.838			
Cues to action					
	CA1	0.882	0.770	0.866	0.684
	CA2	0.769			
	CA3	0.826			
Celebrity endorsement					
	CE1	0.883	0.965	0.972	0.833
	CE2	0.742			
	CE3	0.925			
	CE4	0.961			
	CE5	0.956			
	CE6	0.960			
	CE7	0.943			
Intention to perform infection prevention behaviour					
	IPB1	0.903	0.949	0.958	0.742
	IPB2	0.922			
	IPB3	0.912			
	IPB6	0.873			
	IPB7	0.843			
	IPB8	0.890			

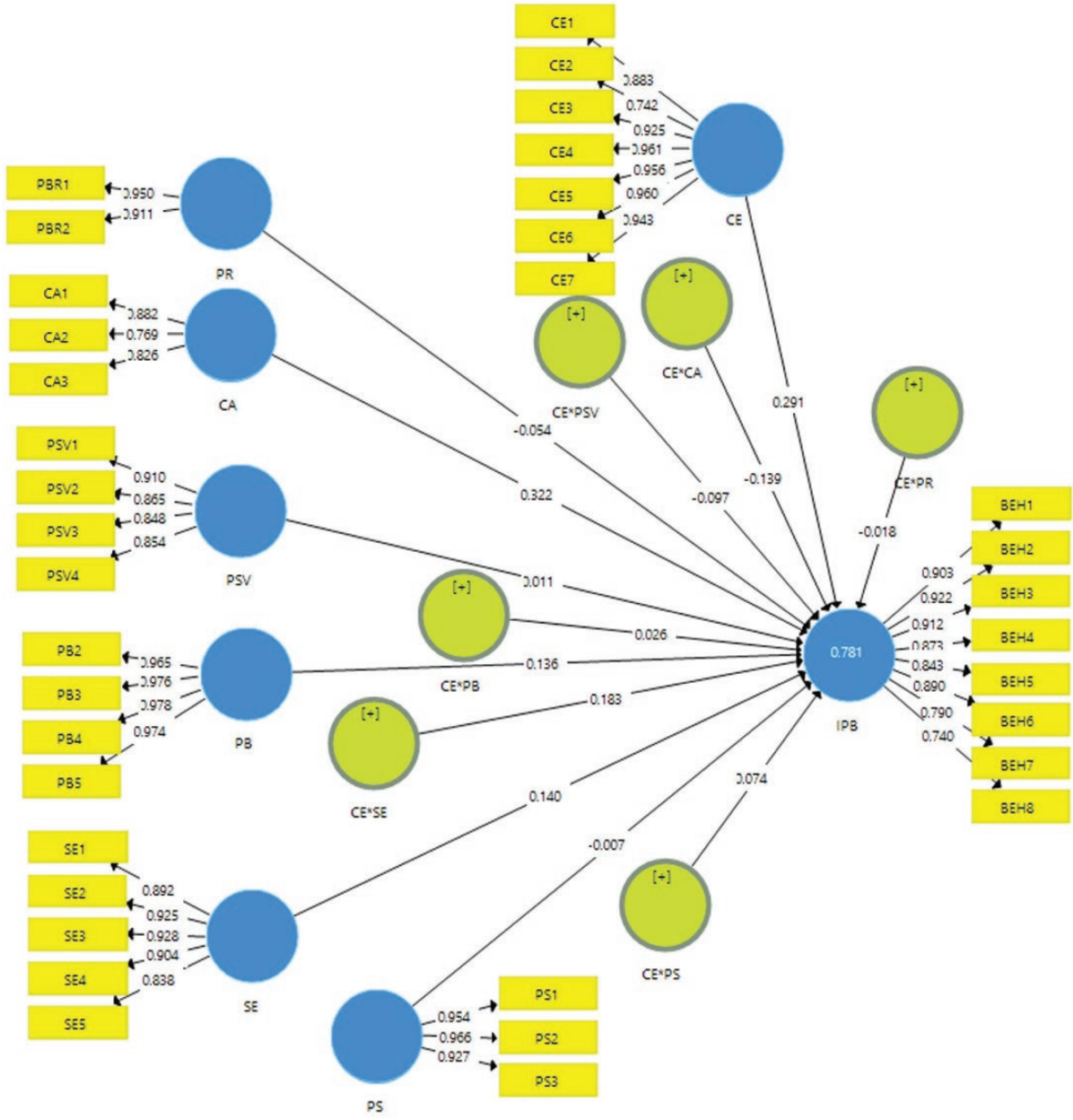

Fig. 2: Structural model.

Moderation analysis

The result of the moderation analysis is also displayed in Table 2. The result shows that CE significantly moderate the relationship between perceived severity, susceptibility, self-efficacy and cues to action providing support for H7 (β = 0.074, t = 2.849, p < .05), H8 (β = 0.097, t = 2.268, p < .05), H11 (β = 0.183, t = 4.964, p < .05) and H12 (β = 0.139, t = 2.957, p < .05).

DISCUSSION

The aim of this study was to empirically examine the moderating effect of CE on the relationships between the constructs of HBM (PSV, PS, PB, PR, SE and CA) and target audiences' intention to perform infection preventive behaviours. Thus, can celebrity endorsement be used as an effective communication tool to influence target audiences' intention to perform infection preventive behaviour?

Table 2: Results of direct hypothesized structural path and moderation analysis

Hypothesis	Hypothesized path	Beta	*T*-statistics	*p*-value	
Direct hypothesized structural path					
H1	**PS -> IPB**	–0.007	0.244	**.808**	
H2	**PSV -> IPB**	0.011	0.220	**.826**	
H3	**PB -> IPB**	0.136	3.003	**.003**	
H4	**PR -> IPB**	–0.054	2.463	**.014**	
H5	**SE -> IPB**	0.140	3.320	**.001**	
H6	**CA -> IPB**	0.322	5.979	**.000**	
Moderation analysis					
H7	CE*PS -> IPB	0.074	2.849	.005	Accepted
H8	CE*PSV -> IPB	0.097	2.268	.024	Accepted
H9	CE*PB -> IPB	0.026	0.707	.480	Rejected
H10	CE*PR -> IPB	–0.018	0.676	.499	Rejected
H11	CE*SE -> IPB	0.183	4.964	.000	Accepted
H12	CE*CA -> IPB	0.139	2.957	.003	Accepted

The result of the current study disagrees with past findings (e.g. Tweneboah- Tweneboah-Koduah, 2018; Tweneboah-Koduah and Coffie, 2022; Yildirim and Kocaağalar Akince, 2022). Although perceived susceptibility and severity are two critical factors necessary for target audiences to form an intention to perform a recommended behaviour, past studies have largely shown an insignificant relationship between these two variables and intention to perform infection prevention behaviours (Luquis and Kensinger, 2019; Guidry et al., 2021; Tweneboah-Koduah and Coffie, 2022). Our result however, shows that although there is an insignificant direct relationship between perceived susceptibility, severity and intention to perform infection preventive behaviours, the introduction of CE as a moderator has a positive and significant influence on the relationship between these variables. This implies that target audiences are more likely to change their perception of the severity of infectious diseases and form an intention to perform the behaviour when celebrities endorse the behaviour. As indicated by Schartel Dunn and Nisbett (2020), the trust imposed in celebrities by their followers has made them a kind of social authority and our finding suggests that endorsement by a celebrity will have a significant influence on how target audience perceive severity and their vulnerability to infectious diseases and thereby, their willingness to engage in infection prevention behaviours such as frequent handwashing. The result, thus, demonstrate the effectiveness of CE in promoting infection prevention behaviour. This agrees with Schartel Dunn and Nisbett (2020) and Ferrari (2021) that target audiences are more likely to accept health communications endorsed by a celebrity.

The result further reveals a direct, positive and significant relationship between perceived benefit and intention to perform the behaviour. This suggest that the higher the target audience perceives that they will benefit for performing the infection prevention behaviour, the higher the likelihood that they will take steps to perform it. The benefits include staying healthy, reduced risk of illness, cost savings from hospital bills, enhanced productivity (more days to work), slow the development of antibiotic resistance, reduced discomfort, pain and potential long term consequences. Social marketing interventions should therefore highlight these benefits. This finding resonate with the work of Tweneboah-Koduah (2018) that target audience voluntarily performed BSE when they perceived higher benefit for performing the behaviour.

The result further shows a negative but significant relationship between perceive barrier and intention to perform the behaviour suggesting that the higher the barrier, the lower the possibility that the target audience will take step to perform the behaviour (Luquis and Kensinger, 2019; Moghadam *et al.*, 2020).

Additionally, the result also shows that although self-efficacy and cues to action have a direct, positive and significant influence on intention to perform the behaviour, the introduction of CE as a moderating variable made the relationships stronger. This suggests that when a celebrity endorses infection prevention behaviours, the self-efficacy, confidence and desirability of target audiences to perform the behaviour will significantly increase. Thus, our study

differs from past studies (e.g. Luquis *et al.*, 2019) by indicating a stronger relationship with CE. Our findings however, provides empirical support for the argument made by Schartel Dunn and Nisbett (2020) that the use of celebrities for social advertising is a valuable tool for transmitting social marketing messages.

CONCLUSION

Past efforts to encourage the performance of infection prevention behaviours among target audiences have paid little attention to the role of celebrity endorsement. Using the HBM, the study examined the interactive role of CE on the relationship between perceived susceptibility, and severity, perceived benefit, perceived barriers, cues to action and self-efficacy and target audience intention to perform infection prevention behaviours. The result shows that CE plays a positive and significant interactive role between the variables mentioned above and target audiences' intention to perform infection prevention behaviour. The result provides some valuable theoretical and practical implications.

Theoretical implications of the study

The study contributes to the development of theory in social marketing and infection prevention by examining and shedding light on the moderating role of CE on the relationships between the constructs of HBM and the intention to perform infection prevention behaviour Rundle-Thiele *et al.*, (2019). Although the HBM has been extensively applied to explain health-related behaviours, our result statistically shows that using celebrities to endorse the various constructs of the HBM significantly enhances the predictive ability of the model. Second, the HBM posits that for people to take action to perform a recommended behaviour to prevent a health condition or disease, they must believe that; (i) the disease is severe/dangerous, (ii) they are susceptible to it, (iii) must perceive benefit for performing the recommended behaviour and (iv) believe that they are capable of overcoming barriers to the performance of the recommended behaviour. The current study shows that communicating or educating target audiences about these variables through celebrities yields a better result in encouraging target audiences to perform the recommended behaviour. Thus, the positive and significant moderating effect of CE implies that the more celebrities get involved in promoting infection preventive behaviours, the higher the possibility that target audiences will take steps to perform the recommended behaviour.

Practical implications

Practically, the study made some recommendations for social marketers, infection preventionist and policymakers seeking to promote the performance of infection prevention behaviours among target audience. First, the positive relationship between perceived benefit and willingness to perform the behaviour implies that exchange is likely to occur when the target audience perceives a high benefit or value in the product (the recommended behaviour). Thus, to make the product (infection preventive behaviour) viable for target audiences, social marketers should focus on the benefits of performing these behaviours such as staying healthy and avoiding hospital bills. Second, since promotion is one of the key marketing tools social marketers use to persuade their target to voluntarily adopt a recommended behaviour, the result shows that using CE as a promotional tool will significantly influence target audiences' perception of severity of infectious diseases and their susceptibility to contracting these diseases, thereby encouraging the performance of the recommended behaviour. Additionally, based on the findings of the study, using celebrities will boost target audiences' confidence and self-efficacy to avoid handshaking and use an elbow for greeting, wash their hands frequently with soap or sanitize their hand frequently.

In the current study, price is conceptualized as perceived barriers that target audiences must overcome to perform the recommended behaviours. The negative significant relationship between perceived barriers and intention to engage in infection prevention behaviours implies that the lower these prices (perceived barriers), the higher the likelihood that the target audience will take steps to obtain the product. For the current study, the perceived barriers have been conceptualized as cultural beliefs about handshaking, social gathering and conspiracy theories about infectious diseases. Thus, dealing with these psychological costs associated with performing the behaviour is necessary to achieve the performance of the behaviour. Social marketers should also project the benefits/value of the product as being higher than the psychological cost of obtaining the product. Since accessibility (place) plays a key in shaping the intention and actual performance of a recommended behaviour, social marketers or policymakers should influence managers of public and private businesses to establish handwashing points and automatic hand sanitizers in vantage points.

Limitations of the study and future direction

Irrespective of the numerous contributions of this paper, the study has some shortcomings that point to areas where more research should be conducted. Though the study finds the use of celebrity endorsement as a significant moderating variable in the

relationship between perceived severity, susceptibility, self-efficacy and cues to action and intention to perform infection preventive behaviours, the attributes or characteristics of a celebrity needed to deliver the social message effectively have not been identified in this study. Further studies are needed to ascertain attributes or characteristics required of celebrities to transmit social marketing messages successfully. As stated by Macnab and Mukisa, not all celebrities have a reputation or image that makes them suitable to endorse health promotion (Macnab and Mukisa, 2019). The current study is conducted from an emerging market context. Conducting future studies from other contexts will help enrich the findings of the current study. The study focused on prevention of indirect infectious diseases from the perspective of the HBM and CE. Future studies could use HBM or other behavioural change theories or a combination of theories with CE to predict behaviour change towards the prevention direct infectious diseases.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Health Promotion International* online.

CONFLICT OF INTEREST

The authors have no conflict of interest

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AUTHOR CONTRIBUTIONS

I.S.C.: Project administration, review and editing. T.E.Y.: Methodology and validation. E.C.O.: Conceptualisation and data curation. V.M.: Formal analysis of data and drafting of the original manuscript.

ETHICAL APPROVAL

Ethical approval for the study was obtained from the ethical committee of the Accra Technical University (ATUEAC: NO: 1112).

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APPENDIX

Survey on Infection Prevention Behaviour

Dear Participant,

Thank you for your interest in participating in this study. We greatly appreciate your time and valuable input. The purpose of this research study is to explore people's intention to perform infection prevention behaviours such as frequent hand washing with soap, frequent sanitizing hands with alcohol base sanitizers etc. By understanding the factors that influence individuals' intentions to engage in such behaviours, we aim to develop effective strategies to promote infection prevention and improve public health.

Your responses will contribute to our understanding of this important topic. Please, be rest assured that your participation in this study is entirely voluntary and all your responses will be kept strictly confidential. Your anonymity will be maintained throughout the study, and your personal information will remain confidential.

For each of the following statements, please indicate your level of agreement or disagreement. **1 = strongly disagree; 2 = agree; 3 = neutral; 4 = agree; 5 = strongly agree**

No.	Item					
	Perceived severity	**1**	**2**	**3**	**4**	**5**
1	Infectious diseases such as TB, coronavirus, cold, are very dangerous to contract					
2	Infectious diseases such TB, cold, stomach flu, Ebola etc can kill me easily.					
3	Because there is cure for most infectious diseases, it is not dangerous to contract.					
4	It is normal to get infectious diseases					
	Perceived susceptibility	**1**	**2**	**3**	**4**	**5**
1	It is easy for me to get infected with infectious diseases.					
2	The possibility of me contracting infectious disease is very high.					
3	I believe I am at danger of contracting infectious diseases.					
4	I am concern about my likelihood of contracting infectious disease.					
	Perceived benefit	**1**	**2**	**3**	**4**	**5**
1	Avoiding handshake with people will keep me safe from catching infectious diseases.					
2	Performing infection prevention behaviours such as washing hand frequently with soap will reduce the spread of infectious diseases.					
3	Infection prevention behaviours such as sanitizing my hand frequently will reduce my risk of getting infectious diseases.					
4	Adopting preventive such as elbow greeting is beneficial to myself and the public in general					
5	I will help protect my family and contribute to stop spread of infectious diseases if I perform infection prevention behaviours.					
	Perceived barriers	**1**	**2**	**3**	**4**	**5**
1	My friends and society will tag me as unsociable and disrespectful if I refuse to shake hands with them.					
2	It is difficult to remember to carry sanitizers around everywhere I go					
3	I have to show love to my friends by attending social gatherings					
4	It is difficult to wash hand effectively with soap					
	Self-efficacy	**1**	**2**	**3**	**4**	**5**
1	I am able to refuse hand shake from people and avoid large gatherings					
2	I can insist on greeting with my elbow					
3	I can remember to keep sanitizer in my bag or hook it on my belt hole					
4	I am able to remember to sanitize my hand frequently					
5	I wash my hands with soap frequently and before eating.					
	Cues to action	**1**	**2**	**3**	**4**	**5**
1	I remember to sanitize my hands when I see pictures of people sanitizing their hand.					
2	When I see hand sanitizers fixed in public places, it prompts me to sanitize my hands.					
3	When I hear or see					

No.	Item					
	Celebrity endorsement	**1**	**2**	**3**	**4**	**5**
1	Celebrity endorsement will influence my perception and believe about how dangerous infectious diseases are					
2	Celebrity endorsement will increase my confidence and ability to perform infection prevention behaviour.					
3	I think celebrity endorsement of elbow greeting and frequent sanitizing with alcohol base sanitizer will make me adopt the behaviour.					
4	I think celebrity endorsement of celebrity endorsement of frequent hand washing with soap will influence my intention to wash hand frequently with soap					
5	Celebrity endorsement will change my perception and believe about my possibility of getting infectious disease					
6	Celebrity endorsement of avoiding hand shake with people will increase my confidence to also avoid hand shake from people.					
7	I think celebrity endorsement of infectious diseases and how to prevent them would get my attention easily.					
	Intention to perform infection prevention behaviour	**1**	**2**	**3**	**4**	**5**
1	I intend to wash my hand with soap frequently					
2	I will wear nose mask in public places when I have infectious diseases					
3	I will cover my mouth with my elbow when coughing or sneezing					
4	I will sanitize my hand frequently with alcohol base sanitizer					
5	I intend to use my elbow to greet people					
6	I will avoid shaking hands with people to protect myself from getting infectious diseases					
7	I am motivated to adopt and continue preventive behaviours to protect myself and others					
8	I will avoid large social gatherings					