Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Telematics and Informatics Reports 7 (2022) 100012

Contents lists available at ScienceDirect

Telematics and Informatics Reports

journal homepage: www.elsevier.com/locate/teler

Influence of diverse kinds of persuasive messages on intention to stay home during COVID-19 pandemic: Moderating role of media type

Marjan Basirat[a], Pejman Ebrahimi[b,*], Parisa Bouzari[c], Seyed Mahdi Sharifi[d], Maria Fekete-Farkas[e]

[a] Ph. D Student in Media Management, Faculty of Management, University of Tehran, Iran
[b] Doctoral School of Economic and Regional Sciences, Hungarian University of Agriculture and Life Sciences(MATE), Gödöllő 2100, Hungary
[c] MSc Supply Chain Management , Institute of Agricultural and Food Economics, Hungarian University of Agriculture and Life Sciences (MATE), Gödöllő 2100, Hungary
[d] Associate Professor in Media Management, Faculty of Management, University of Tehran, Iran
[e] Institute of Economic Sciences, Hungarian University of Agriculture and Life Sciences (MATE), Gödöllő 2100, Hungary

ARTICLE INFO

Keywords:
COVID-19
Novel coronavirus
Social lockdown
Persuasion
Persuasive messages
Media messages

ABSTRACT

This study highlights the influence of diverse kinds of persuasive messages on intention to stay home during COVID-19 pandemic. The COVID-19 pandemic is believed to be the top modern societal challenge necessitating extensive collective action and collaboration. The statistical population included Iranian individuals by answering our online survey questionnaires at diverse phases of the COVID-19 pandemic. 406 completed questionnaires were gathered and analyzed. Note that, according to the official reports, Iran encountered COVID-19 disease since February 19, 2020. Data collection was started on July 18, 2020 (at the beginning of second wave of COVID-19 in Iran) and lasted until October 30, 2020. Various social network platforms including Instagram, WhatsApp, Facebook and Telegram were used for distribution of the questionnaires. According to the results, perceived severity and perceived self-efficacy had an insignificant direct influence on intention to stay home. From another perspective, perceived vulnerability ($\beta = 0.261$, CI = 0.059; 0.242]) and perceived response efficacy ($\beta = 0.502$, CI = 0.347; 0.656]) positively and significantly affected the intention to stay home. Moreover, no significant difference was found between these two kinds of media messages in research sample. Our findings showed that "perceived response efficacy" has the highest importance score of 0.502; if the perceived response efficacy performance is boosted by one unit point by individuals during COVID-19 pandemic, its overall intention to stay home will increase by 0.502. Besides, our results showed that lowest performance (78.104) is associated with perceived vulnerability highlighting an excellent opportunity for improvement in this area.

1. Introduction

COVID-19 is believed to be the deadliest pandemic round the world [42]. This disease is highly contagious and it is transmitted rapidly and easily through symptomatic and asymptomatic carriers [39]. The COVID-19 pandemic is believed to be the top societal challenge in recent years necessitating extensive collective action and collaboration. Undoubtedly, some actions can help restrict pathogen transmission, however, self-isolation is a significant step in this regard [26]. Until the comprehensive and common use of vaccinations, extreme behavioral change and societal coordination are believed to be the best strategies to hamper the spread of the virus. There is no doubt that the behaviors for hampering the spread of the virus are not easy to follow since they require cautious hand washing, wearing facial masks, and most importantly, complying to the extreme social distancing measures. Since, this disease is so deadly and contagious and self-isolation is considered as the most effective behavior to slow down the spread of the virus [63] on one hand, and staying home can causes financial problems for people and impact their physical and mental health [2,25] on the other hand, creating effective messages on the part of the public health officials for motivating behavior change is a challenge [25]. Therefore, decision makers are looking for the most effective ways to convince people to obey the rules. In addition, the general public is not usually completely aware of the direct significances of environmental hazards, thus the mass media can provide clues about such risks for individuals [11]. A Japanese study [41] focused on the impact of different kinds of persuasive messages for encouraging staying home during the COVID-19 pandemic and social lockdown. Other previous studies [7,25,36] as Table 1 illustrates,

* Corresponding author.
E-mail addresses: marjanbasirat@ut.ac.ir (M. Basirat), Ebrahimi.Pejman@stud.uni-mate.hu (P. Ebrahimi), Bouzari.Parisa@stud.uni-mate.hu (P. Bouzari), sharifee@ut.ac.ir (S.M. Sharifi), Farkasne.Fekete.Maria@uni-mate.hu (M. Fekete-Farkas).

https://doi.org/10.1016/j.teler.2022.100012
Received 29 June 2021; Received in revised form 4 January 2022; Accepted 7 July 2022

Table 1
Previous researches related to COVID-19 and intention to stay home.

No.	Author	year	Title	Source	Findings
1	Tsuyoshi Okuhara, Hiroko Okada and Takahiro Kiuchi	2020	Examining persuasive message type to encourage staying at home during the COVID-19 pandemic and social lockdown: A randomized controlled study in Japan	Patient Education and Counseling	Messages from a physician, which conveyed the crisis of overwhelmed hospitals being overwhelmed and the consequent risk of people being unable to receive treatment, increased the intention to stay at home to a greater extent than other messages from a governor, a public health expert, a patient with COVID-19, and a resident of an outbreak area.
2	Michael A. Callow, Daniel D. Callow, and Charles Smith	2020	Older Adults' Intention to Socially Isolate Once COVID-19 Stay-at-Home Orders Are Replaced With "Safer-at-Home" Public Health Advisories: A Survey of Respondents in Maryland	Journal of Applied Gerontology	Attitude toward social isolation was affected by perceived benefits and barriers to social distancing measures, perceived severity of COVID-19, and political affiliation. Behavior intention was influenced by attitude, subjective norms, political affiliation, and messaging strategies.
3	Peter D. Lunn, Shane Timmon, Cameron A. Belton, Martina Barjakova´, Hannah Julienne, Ciaran ´ Lavin	2020	Motivating social distancing during the COVID-19 pandemic: An online experiment	Social Science & Medicine	Messages that invoke thoughts of infecting vulnerable people or large numbers of people can motivate social distancing and, hence, help to limit the spread of COVID-19.
4	Joseph Heffner, Marc-Lluís Vives and Oriel FeldmanHall	2021	Emotional responses to prosocial messages increase willingness to self-isolate during the COVID-19 pandemic.	Personality and Individual Differences	Both threat and prosocial messages were equally effective in stimulating willingness to engage in disease prevention health behaviors. However, the efficacy of the prosocial message, compared to the threat message, was more dependent on the magnitude of the evoked emotional response on both arousal and valence dimensions.

mostly focus on the source and characteristics of persuasive messages and identification of the best type of media to send these messages was not covered by these studies. As one of the most important challenges for decision makers is to choose the best carriers to send persuasive messages, further research is needed to identify the best type of media to improve efficiency. Accordingly, this study focuses on the role of media type in persuasive messages for encouraging individuals to stay home during this pandemic. The influence of diverse kinds of persuasive messages on intention to stay home during COVID-19 pandemic and moderating the roles of media types are studied in this paper.

This paper is in the following structure: First, we review the literature of media messages and encouraging people to stay home in pandemic. Then we develop four hypotheses and examine whether they influence the intention to stay home. The third part explains the measures and data collection with structural equation modeling. Finally, paper discusses about results and make some suggestion for future researchers.

2. Literature review and hypotheses development

Countries, one by one, started to take containment and mitigation measures following the pandemic outbreak while information about the virus' transmission dynamics, clinical characteristics, or effective treatments was scarce. The best strategies to control the risk of infection with SARS-CoV-2 (Centers for Disease Control and Prevention [CDC], n.d.-c) were handwashing, social distancing (hereinafter called physical distancing [WHO, 2020d]), and mask wearing. Studies on COVID-19 has gathered significant momentum, but, information is still rapidly developing, further complicating health communication messaging [64]. Following the worldwide reactions to the Coronavirus Disease 2019 (COVID-19) pandemic, our societies have been witnessing dramatic changes to human behavior because public officials are paying special attention to the health of their citizens and the influence on the economy with stay-at-home and social distancing instructions [35]. Since social distancing and decreasing social interactions with others are believed to save millions of lives during the COVID-19 pandemic [18], public health advisors believe that managing the spread of COVID-19 is dependent on the individuals to acclimatize and modify their habits for conforming to the new social distancing measures quickly. By staying home, we mean following the rules Okuhara et al [41] suggested. Cancelling or postponing plans such as "meeting people", "eating out" and "attending events" [41]. Due to negative consequences of social distancing measures like higher unemployment rates, less work productivity and unexpected effects on the individuals' mental well-being, strategies to hamper the spread of COVID-19 are not parallel to daily life functioning [25]. However, new reports show that people are significantly different in terms of implementing measures for hampering the pathogen transmission [36]. Governments, public bodies, private organizations, and individuals are able to easily instruct people on the reasons for keeping the distance from others, some platforms for sharing messages are believed to be better than others [36]. Undoubtedly, media can be the source of persuasive messages to influence people's behavior. This study tries to show of "perceived severity", "perceived vulnerability", "perceived response" and "perceived self-efficiency" influence the intention to stay home. Table 1 is illustrated based on previous researches in the field of COVID-19.

2.1. Perceived severity and intention to stay home

Studies have confirmed the variations in the risk perceptions of COVID-19 and their association with both engagement in health-protective behaviors and poor mental health outcomes, but information on the way individuals perceive the risk of COVID-19 relative to other infectious diseases is scarce [63]. In the first study on the risk perceptions and engagement in health-protective behaviors, including staying-at-home, for the COVID-19 pandemic, 6991 adults from 10 countries across Europe, America, and Asia were investigated. The study identified the main predictors of COVID-19 risk perception including personal experience with the virus, individualistic and prosocial values, hearing about the virus from friends and family, trust in government, science, and medical professionals, personal knowledge of government strategy, and personal and collective efficacy [12]. Other studies reported that feeling personally at risk of COVID-19 infection is probably linked to a greater inclination to perform disease prevention health behaviors such as social distancing in the early stages of the pandemic [7,67]. The few studies focusing on individuals during the early stages of a pandemic reported linked the perceived personal risk of infection and the health effects of infection to involvement in social distancing and other health-protective behaviors [34]. Earlier investigation have shown that assessing psychological and behavioral responses in pandemic situations is significant to know how perceived risk forms involvement in health-protective behaviors, since this information could inform the content and tone of public health messaging [6]. Substantial resistance to social distancing measures has been reported in some countries, with widespread protests linked to perceptions that lockdown measures influencing civil freedoms. Following the social distancing measures is dependent on the seriousness of COVID-19 infection and differences in perceptions of individual risks of infection [63]. Stapleton [62] showed why individuals understand the instructions such as stay-at-home during the COVID-19 pandemic, but they prefer non-compliance. She argues that speakers (rule-givers) should pay attention to their credibility, authority and ability to mediate consequences, rule plausibility, setting acceptable motivative augmental control, if the behavior specified in the rule clashes with habits, and if the message provokes non-compliance [62]. The main reaction to the epidemic was stay-at-home instructions restricting social mobility as a mechanism to hamper the spread of COVID-19 infection [63], individuals have not been assured on how the perceived severity influences the intention to stay home. For investigating the possible influence of perceived severity on intention to stay home during pandemic, this hypothesis is proposed:

H1: Perceived severity influences the intention to stay home in COVID-19 pandemic condition.

2.2. Perceived vulnerability and intention to stay home

According to optimism bias, individuals often judges the risk of experiencing negative health conditions poorly and miscalculate their probability of infection relative to the average person [56]. According to Health Belief Model (HBM), if individuals perceive themselves as being vulnerable to a pathologic condition with possible serious consequences, then they may be motivated more to embrace pro-health mindsets and health behaviors [8]. For instance, one may assume that excluding themselves from circumstances that could increase risk of exposure, as going out, will be helpful for COVID-19 avoidance. As such, they may be motivated more to stay home. According the model, people are more likely to embrace a health behavior (i.e., stay home) if they feel they are at high risk of being infected (perceived vulnerability), the disease leads to significant health risks (perceived severity), involvement in the preventive measures is beneficial and they are exposed to persuasive cues and action [49].

The mass media can potentially influence public rational about provocative environmental and science issues, particularly for emergent topics for which exists unsolidified public opinion accompanied by incomplete awareness or inaccurate knowledge [4]. When risk messages are presented in the form of vivid and affect-laden circumstances, the addressee tend to perceive greater personal vulnerability [59]. For investigating the possible effect of perceived vulnerability on intention to stay home during pandemic, this hypothesis is proposed.

H2: Perceived vulnerability influences the intention to stay home in COVID-19 pandemic condition.

2.3. Perceived response efficacy and intention to stay home

As it was mentioned before, staying-at-home is the most effective reaction to hamper the spread of COVID-19 infection [63]. Studies also prove that virus transmission is decreased by implementing social distancing [1]. However, it is not easy to be separated from loved ones, to lose freedom, or to be uncertain about the status of the disease [2]. Consequently, people are entitled to be justified for conforming to the rules, including social distancing. However, it is hard to imagine that self-preservation would bring about the required behavioral changes from a societal perspective, particularly among younger adults at low risk of serious harms. On average, people were not worried much about their own health than about the influence of prolonged restrictions and, particularly, the health of family and friends [36]. In simple terms, effective messages just instruct people on preventing of infections and nothing is shared about the significance of infection avoidance in the entire society. The suggestions are not for messages only from public health authorities, but from all types of organizations and people promoting social distancing [36]. It is believed that the perceived benefits of social distancing behaviors, along with the perceived seriousness of COVID-19 to one's health positively influenced the mindset about social distancing measures. Moreover, as it was anticipated, perceived barriers to social distancing measures negatively influenced the mindset about social isolation [7]. Within media messages, affective response is significantly involved in judgment and decision making [59] and the expected benefits of a behavior is important in this process.

For investigating the possible influence of perceived response efficacy on intention to stay home during pandemic, this hypothesis is suggested.

H3: Perceived response efficacy influences the intention to stay home during COVID-19 pandemic.

2.4. Perceived self-efficacy and Intention to stay home

According to Theory of Planned Behavior (TPB), behavior intention is more prominent if the person's attitude toward the behavior is satisfactory, when important people in someone's life approve of that behavior, and when the person assumes he/she can perform the behavior [7]. Studies show that in coronavirus messaging, other-focused (vs. self-focused) appeals for an array of health behaviors intensifies the intentions to practice such behaviors [31]. -The reason is that other-focused (vs. self-focused) appeals function more as moral arguments. Thus, consistent with the moral matching hypothesis, message persuasiveness depends on how much the addressee saw public health as a moral issue. Specifically, the more people advocate public health, the other-focused arguments will be compelling more for them and they aim more to practice the advocated behaviors [37].

Studies show that perceived benefits and barriers to social distancing measures, influence attitude toward social isolation [7]. Thus, affect is significantly involved in encouraging behavior and decisions. Since affect is capable of guiding risk perception and decision-making, knowing how individuals are exposed to and make sense of affective cues about the environment seems vital. As the general public is not complete aware of the direct significances of environmental threats, the mass media can provide every one with affective cues about such risks for these individuals [11].

Luttrell & Petty recommended during a global pandemic, messages emphasizing the profits of social distancing for the health and well-being

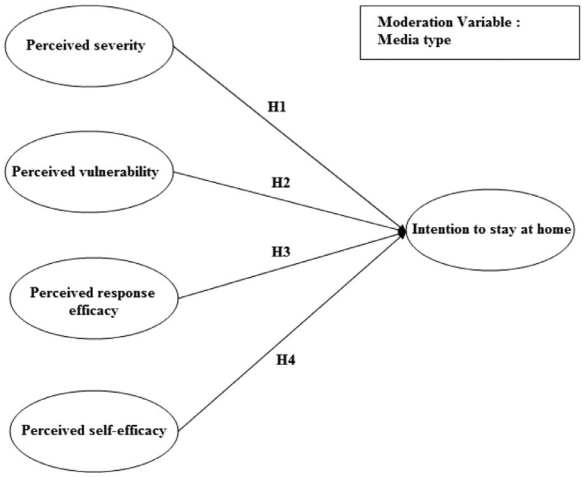

Fig. 1. Research Model.

of others might be more influential than messages underlining social distancing's profits for one's own health, chiefly for people who consider public health as a relatively moral issue [37]. For testing the possible influence of self-efficacy on intention to stay home during pandemic, this hypothesis is suggested.

H4: Perceived self-efficacy influences the intention to stay home during COVID-19 pandemic.

2.5. Media type

The severity of COVID-19 risk is declared in different ways. On one hand, descriptions of increases in hospitalizations and deaths enhance the COVID-19 severity perception; On the other hand, comparisons with the flu and rural states not yet experiencing COVID-19 downplays the risk [28]. During this period of time, whether the control policies are activated by governments or the implementation of these norms is voluntary, the effectiveness of containment measures depends on the people's perception of contagious risks [66]. As a result, the current COVID-19 risk perception can affect the adoption of recommended protective behaviors such as staying home.

In the time of health emergencies, receiving valid information can affect individual's behaviors. A study which examines the relationship between media usage and taking protective actions shows that higher use of media and higher rate of their trustfulness is related with a higher COVID-19 threat perception, higher response-efficacy and self-efficacy, and larger use of protective behaviors [65]. The results of researches in Hong Kong and Vietnam communities [29,33] also indicate associations between COVID-19 risk perception and taking protective behaviors like social distancing and usage of media.

Since understanding the role of media during the pandemic can help policymakers to develop better strategies, it is necessary to examine the possible effect of media type on practicing protective behaviors such as staying home during COVID-19 pandemic. For testing the possible influence of media type on intention to stay home during pandemic, this hypothesis is suggested.

H5: Media type can moderate the effect of perceived severity, perceived vulnerability, perceived response efficacy and perceived self-efficency on intention to stay home during COVID-19 pandemic. The research model is shown in Fig. 1.

3. Measures and data collection

All measures were modified based on preceding studies [41,46,51]. 15 items were applied on a 5-point Likert scale from "Strongly disagree = 1" to "Strongly agree = 2", three items for each variable.

Table 2
Demographic attributes

Respondent Profile		(N= 406)	
Attributes	Distribution	Frequency	Percent
Gender	Male	292	71.9
	Female	114	28.1
Age	19 and below 19 years old	20	4.9
	20 to 29	130	32.0
	30 to 39	130	32.0
	40 to 49	72	17.7
	50 to 59	42	10.3
	60 and up	12	3.0
Education	Below diploma	14	3.4
	Diploma	62	15.3
	Associate degree and Bachelor	152	37.4
	Master	134	33
	PhD	44	108
Media Type	Online social media	306	75.4
	TV & Radio	100	24.6
	Magazine	0	0

The statistical population of the study involved Iranian individuals answering online survey questionnaires in diverse phases of the COVID-19 pandemic.

The minimum sample size is not arbitrary in the PLS-SEM technique. PLS-SEM models are run with a small sample size using bootstrapping techniques, but their outcomes and accuracy strongly depend on the sample size [10,21]. Consequently, according to the specifications of PLS-SEM models and using SPSS Sample Power sampling software an optimal sample size was established. This research uses the convenience sampling approach in gathering the data. While this approach is commonly used in quantitative studies to overcome bias [3,15]. (The Harman's single-factor has been carried out with five variables. The five factors were then loaded into a single factor. The analysis shows that the largest variance explained by the newly created factor is 41.10%, which is below the threshold value of 50% [44].

The largest number of variables was 4 in the set multivariate regression model by considering a confidence level of 95%, a power of increment of 0.95, and an increment to R-squared of 0.05. A minimum sample size of 358 was considered based on the research model. Foe ensuring validity in sampling, and obtaining more data in the COVID-19 gloomy condition, gathering data was done uninterruptedly for obtaining more questionnaires. Finally, 406 completed questionnaires underwent analysis. Prior to proceeding to the formal data collection process, a pilot study was done for ensuring the content validity and reliability from 25 sample size. Note that, according to the official reports, Iran encountered COVID-19 disease since February 19, 2020. Data collection was started on July 18, 2020 (at the beginning of second wave of COVID-19 in Iran) and lasted until October 30, 2020. Related links were posted and shared on social networks for obtaining good feedback from respondents. Various social network platforms including Instagram, WhatsApp, Facebook and Telegram were used for distribution of the questionnaires. The highest feedback was received through the Instagram platform (55.5%) and Telegram groups (24.5%). Response rates were also low through Facebook (2.5%) platform. In the research sample, 28.1% and 71.9% of the respondents were males and females, in the respective order. The majority of the respondents (32%) were in the age groups of 20-29 years and 30-39 years. Moreover, 37.4% of the respondents had Associate and Bachelor's degrees. 33% of respondents had master's degree revealing high levels of education of majority of respondents. Respondents were instructed to pay attention to the real circumstances of COVID-19 pandemic impact while answering the questions with transparency and loyalty. Based on the type of media, majority of respondents (75.4%) have been influenced by online social media compared to 26.4% respondents who followed TV and Radio programs. A complete description of the respondents' demographic information is depicted in Table 2.

Table 3
Measurement models, Convergent validity, and Reliability

Variables and items	Outer loadings	VIF
Intention to stay home		
(AVE=0.774, C. alpha=0.853, Rho_A=0.859, CR=0.911)		
1. Do you like to abandon or delay plans such as "meeting people," "eating out," and "attending events" due to the new coronavirus infection **(second wave)**?	0.909	2.528
2. Do you like to decrease the time for shopping in stores outside your home due to the new coronavirus infection **(second wave)**?	0.886	2.206
3. Do you like to evade packed spaces due to the new coronavirus infection **(second wave)**?	0.842	1.875
Perceived severity		
(AVE=0.778, C. alpha=0.730, Rho_A=0.863, CR=0.875)		
4. In your opinion, how grave your health will be if you are infected with the new coronavirus **(second wave)**?	0.939	1.494
5. In your opinion, how grave the social situation will be if the new coronavirus spreads **(second wave)**?	0.821	1.494
Perceived vulnerability		
(AVE=0.711, C. alpha=0.702, Rho_A=0.743, CR=0.830)		
1. How likely is it for you to be infected with the new coronavirus **(second wave)**?	0.788	1.227
2. How likely is it for you to be infected with the new coronavirus **(second wave)** in comparison with someone of the same sex and age?	0.895	1.227
Perceived response efficacy		
(AVE=0.728, C. alpha=0.813, Rho_A=0.819, CR=0.889)		
1. Can you save your life from the new coronavirus infection **(second wave)** and stop the spread of infection . . . by abandoning or delaying your appointments such as "meeting people," "eating out," and "attending events"?	0.828	1.739
2. . . . by decreasing the time you spend shopping at stores outside your home?	0.884	1.989
3. . . . by evading packed spaces?	0.847	1.722
Perceived self-efficacy		
(AVE=0.644, C. alpha=0.722, Rho_A=0.728, CR=0.844)		
1. Can you abandon or delay your appointments such as "meeting people," "eating out," and "attending events" due to the new coronavirus infection **(second wave)**?	0.847	1.621
2. Can you decrease the time you spend shopping in stores outside your home due to the new coronavirus infection **(second wave)**?	0.823	1.596
3. Can you avoid the crowded spaces due to the new coronavirus infection **(second wave)**?	0.733	1.255

Notes: AVE, Average of Variance Extracted; C. alpha, Cronbach's alpha; Rho_A, rho_A reliability indices for each construct; CR, Composite Reliability; VIF, Variance Inflation Factor in items level.

4. Results

For the model estimation, the partial least squares structural equation modeling (PLS-SEM) method was applied [21]. PLS-SEM presents satisfactory features upon dealing with complex models, non-normal data, small samples [20]. Measurement models were assessed by SmartPLS 3 (version 3.3.2) software [48]. It is possible to apply PLS-SEM to both reflective and formative measurement models [55]. Reflective measurement models were verified based on CTA analysis (p-value > 0.05) ([13,19,20]; Joseph F Hair Jr, Sarstedt, Ringle, & Gudergan, 2017; [30]). Therefore, reflective measurement models were considered for the assessments. PLS-SEM offers fixed latent variable scores required for running an IPMA. The latter compares the structural model's total impact on a predictor variable with the predictors' average latent variable scores [14,20,47]. Table 3 depicts that means and standard deviations on the five-point scale ranging from1–5, the variances in intention to stay home (M = 3.387,SD = 1.120), perceived severity (M = 3.561, SD = 0.897), perceived vulnerability(M = 3.774, SD = 1.150), perceived response efficacy (M=4.005, SD=0.911) and perceived self-efficacy (M=4.065, SD=0.814) were significant. Accordingly, participants in this sample were different substantially in terms of the extent to which they perceived the significance of stay home during COVID-19 pandemic. Consequently, the sample was well usable to test our hypotheses.

4.1. Evaluation of measurement models

As Table 3 depicts, all Cronbach values, CR and rho_A values were above the threshold of 0.7, showing internal consistency and reliability ([9,16,22,32,40,52]). All the outer loading values were above the 0.7 threshold [21,27,53,55]). However, the AVE scores were above the cut-off point of 0.50 showing the internal consistency of the measurement model [20]. The AVE and outer loadings values also showed the measurement model's convergent validity [50]. Prior to performing the analysis, it was essential to first ensure that collinearity was not a critical problem [54]. The full VIFs are assessed (for all the items). The VIF values were below the threshold value of 5, indicating that collinearity is not a concern. Meanwhile, values less than 3 are considered ideal values ([17,21]). Table 2 depicts the result of the outer VIFs values. According to the reports by Hair et al. [23] and Henseler et al. [27], we evaluated the discriminant validity using the correlations' Heterotrait-Monotraitratio (HTMT) (Table 4). All the HTMT ratios were below 0.85, signifying that the measurement model achieved discriminant validity.

Table 4
Heterotrait-Monotrait Ratio (HTMT)

Construct	1	2	3	4	5
Intention to stay home					
Perceived response efficacy	0.843				
Perceived self-efficacy	0.770	0.761			
Perceived severity	0.671	0.788	0.819		
Perceived vulnerability	0.842	0.733	0.818	0.754	

4.2. Structural model assessment

For obtaining better and more precise results, outlier data were tested prior to testing the hypotheses. FIMIX approach was applied for testing the unobserved heterogeneity of the statistical population and robustness check in PLS-SEM. Actually, FIMIX-PLS is chiefly valuable

Table 5
Results of research hypotheses and model fit

Hypotheses	Direct effect	SD	T-statistics	P value	Low CL	High CL	Decision	Permutation test p-value
H1	0.019	0.056	0.342	0.732	-0.085	0.122	Not supported	0.073
H2	0.261	0.047	5.534***	0.000	0.059	0.242	Supported	0.174
H3	0.502	0.081	6.177***	0.000	0.347	0.656	Supported	0.706
H4	0.024	0.060	0.405	0.686	-0.098	0.137	Not supported	0.131
Model fit	R^2	R^2 Adjusted	Q^2 predic					
Intention to stay home	54.1%	53.7%	0.413					

Note: t>1.96 at * p<0.05; t>2.58 at **p<0.01; t>3.29 at ***p<0.001; two-tailed test

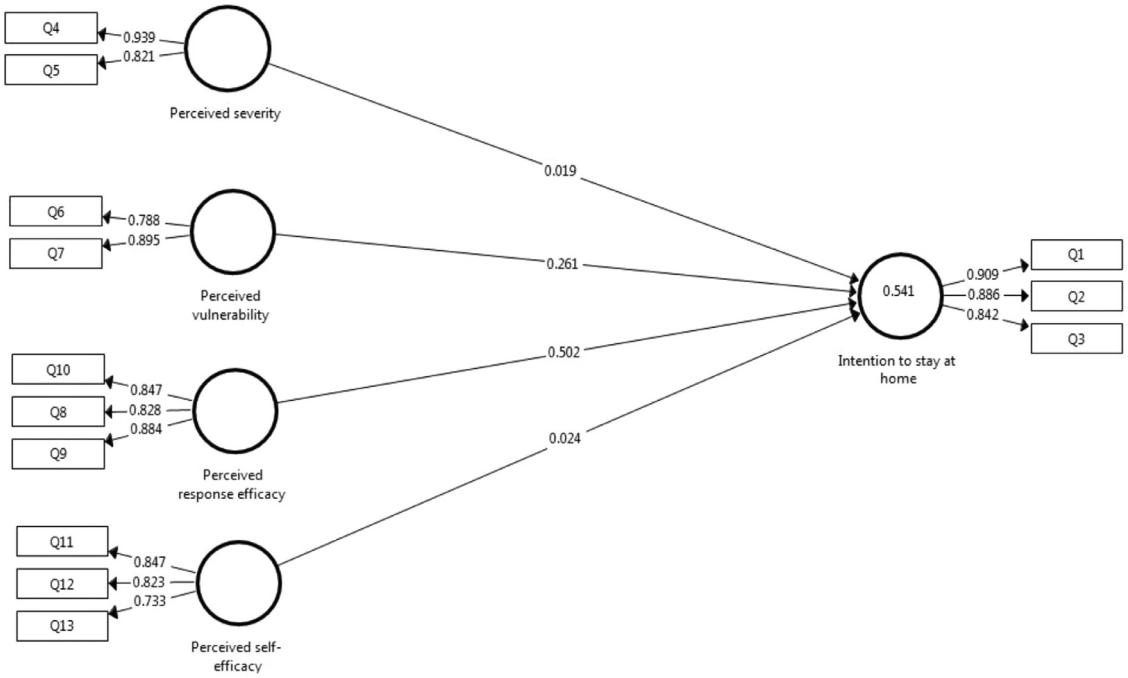

Fig. 2. Path coefficients.

here by making model selection criteria helping to know how many segments to retain from the data (Joe F Hair Jr, Sarstedt, Matthews, & Ringle, 2016; [38]). One of the best criteria for this goal is Entropy Statistic Normed (EN) and the value of EN in this research is 0.976, which is a positive and acceptable value (Joseph F Hair Jr et al., 2017; [45]). Perceived severity had insignificantly influenced intention to stay home (β = 0.019, CI = [-0.085; 0.122]). Thus, H1 is rejected. Perceived vulnerability positively and significantly influenced intention to stay home (β = 0.261, CI = 0.059; 0.242]). Thus, H2 is supported. Perceived response efficacy positively and significantly influenced the intention to stay home (β = 0.502, CI = 0.347; 0.656]). Therefore, H3 is supported. Perceived self-efficacy insignificantly influenced the intention to stay home (β = 0.024, CI = [-0.098; 0.137]). Thus, H4 is rejected (Table 5,Figs. 2 and 3).

For evaluating the model's in-sample fit, we calculated the R^2. The model explained 54.1% of the variance in intention to stay home. Furthermore, the out-of-sample predictive power was determined using the PLSpredict procedure with ten folds and ten repetitions [57,58]. Q^2 predict value of intention to stay home was good and above zero. Therefore, the model had predictive relevance. We considered the intention to stay home as the only model's target construct. As linear model (LM) had a better root mean square error (RMSE) for all target construct's indicators in comparison with the PLS-SEM benchmark (Table 6), the model had high predictive power. Furthermore, NFI index or Bentler and Bonett indexes were used here (NFI for this model is 0.716). NFI led to the values between 0 and 1. The closer NFI to 1, show the better fitness of the model [5].

Table 6
PLS predict assessment of the manifest variable intention to stay home

Items	$RMSE_{PLS\text{-}SEM}$	$RMSE_{LM}$	ΔRMSE
Q1	0.637	0.646	- 0.009
Q2	0.535	0.552	- 0.017
Q3	0.649	0.693	- 0.044

Notes: RMSE = root mean squared error; gray-shaded results = PLS-SEM's predictive power is lower than the LM benchmark.

4.3. Moderating role of media type

The measurement invariance of the composite models (MICOM) procedure suggested by Hair et al. [24] was used in this study. MICOM includes three stages: (i) configural invariance assessment, (ii) compositional invariance assessment, and (iii) the evaluation of equal means and variances. Step 1 deals with setting the configural invariance for ensuring that each latent variable in the PLS path model has been specified equally for all the groups. Configural variance exists when constructs are equally parameterized and estimated across groups. An initial qualitative evaluation of the latent variables' specification across all the groups is compulsory (Joseph F Hair Jr et al., 2017). In step 2, if the test yields a p-value larger than 0.05, compositional invariance can be assumed. In step 3, full measurement invariance is established if no significant differences are observed in mean values and (logarithms of) variances across

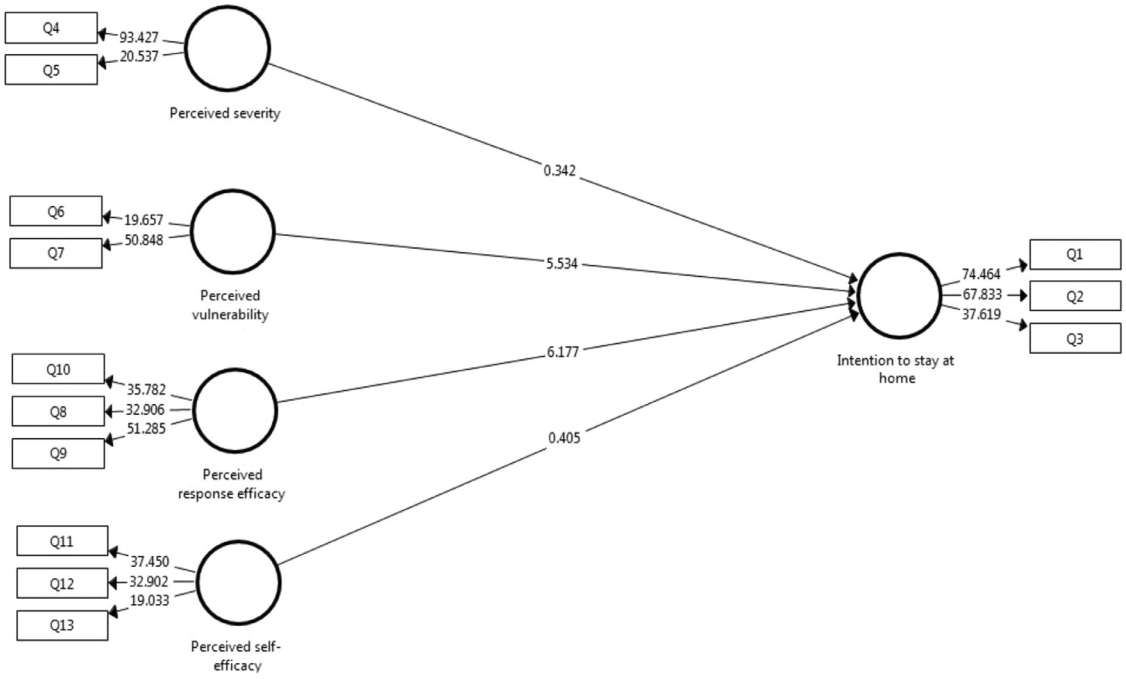

Fig. 3. T-statistics model.

Table 7
MAICOM test

Step 2. Compositional invariance test using permutation			
	C=1	95% CI	CIE?
Intention to stay home	1.000	[0.998; 1.000]	Yes
Perceived response efficacy	0.999	[0.998; 1.000]	Yes
Perceived self-efficacy	0.999	[0.991; 1.000]	Yes
Perceived severity	0.999	[0.985; 1.000]	Yes
Perceived vulnerability	0.973	[0.977; 1.000]	No
Step 3. Equal mean assessment			
	D=0	95% CI	EMV?
Intention to stay home	0.146	[-0.228; 0.225]	No
Perceived response efficacy	0.130	[-0.235; 0.222]	No
Perceived self-efficacy	0.091	[-0.239; 0.221]	No
Perceived severity	0.236	[-0.231; 0.211]	Yes
Perceived vulnerability	0.067	[-0.219; 0.204]	No
Step 3. Equal variance assessment			
	R=0	95% CI	EV?
Intention to stay home	-0.334	[-0.518; 0.410]	No
Perceived response efficacy	-0.335	[-0.782; 0.577]	No
Perceived self-efficacy	-0.197	[-0.674; 0.542]	No
Perceived severity	-0.509	[-0.642; 0.534]	No
Perceived vulnerability	-0.183	[-0.524; 0.469]	No

Notes: C=1: correlation value=1; CI: confidence interval; CIE: compositional invariance established?; D=0: difference in the composite's mean value (=0); CI: confidence interval; EMV: equal Mean values; R=0: logarithm of the composite's variances ratio (R=0); CI: confidence interval; EV: equal variances.

the groups. The results (Table 7) revealed evidence of partial measurement invariance allowing us to compare the standardized coefficients across the two groups of media. For evaluating the moderating role of media type (H5), permutation test approach was applied for comparing online social media and TV & Radio in the model (no respondents was influenced by magazine). This study divided online social media (75.4% respondents) and TV & Radio (24.6% respondents) based on received online questionnaires. Considering p-value>0.05 and confidence intervals, no significant difference is observed between these two types of media in research sample.

Table 8
Importance-performance map analysis

Latent variables	Importance	Performance
Perceived response efficacy	**0.502**	83.294
Perceived self-efficacy	0.024	79.777
Perceived severity	0.019	**83.569**
Perceived vulnerability	0.261	78.104

Note: All total effects (importance) larger than 0.10 are significant at $\alpha \leq 0.10$ level. The bold values indicate the highest importance (total effect) and highest performance value.

4.4. Importance-performance map analysis (IPMA)

IPMA is a very beneficial analytical tool in PLS-SEM that graphically spreading the standard path coefficient estimates in a more practical approach [47]. More precisely, IPMA offers a contrast of importance (i.e. total effect of predecessor constructs in predicting a target construct) and performance (i.e. average latent variable scores). Therefore, IPMA is beneficial for identifying predecessors with a relatively low performance but a high importance for the target constructs. In this study, our target construct is intention to stay home predicted by four predecessors.

It is depicted that "perceived response efficacy" has the highest importance score of 0.502; if people during COVID-19 pandemic boost their perceived response efficacy performance by one unit point, its overall intention to stay home will increase by 0.502. Additionally, our results show that lowest performance (78.104) is related to perceived vulnerability revealing a great opportunity for development in this area. A complete list of importance-performance values in Table 8.

5. Discussion

Given the outbreak of the novel coronavirus, the impact of diverse kinds of persuasive messages on intention to stay home was investigated in this paper. The novel coronavirus (SARS-CoV-2) pandemic is a highly disruptive event considerably influencing the daily life round the world. People infected with COVID-19, the disease caused by SARS-CoV-2, are

found in >200 countries [39]. Since social lockdown is the only prevailing strategy for hampering the pandemic prior to the availability of vaccines for treating COVID-19, behavioral change in individuals, especially staying = home seems vital [41]. According to, Okada and Kiuchi (2020), our findings showed that perceived severity and perceived self-efficacy insignificant influenced the intention to stay home. From another perspective, perceived vulnerability and perceived response efficacy positively and significantly influenced the intention to stay home revealing that when people feel susceptible, they are more likely to follow the instructions and stay home.

According to the results, "perceived response efficacy" has the highest importance score. Generally, people are more likely to help specific victims who are identified, relative to victims described merely statistically [36]. This effect happens even for a specific anonymous victim, if merely thinking about a specific person persuades stronger caring feelings [60]. Since individuals were significantly less worried about their own health than about the health of family and friends [36], using persuasive messages highlighting the inevitability of staying home to protect others would be more effective. According to some investigations, posters highlighted how one person's behavior might bring about the infection of an identifiable, susceptible person, or considerable numbers of other people, amplified caution, as measured by stated intentions for behaviors and assessments of acceptable behaviors [36]. These findings are supported by other recent evidence on messages underlining risks to others and the immediate influence of present behavior (Jillian Jordan, Erez Yoeli, & David Rand, 2020; [43,61]).

From the managerial perspective, IPMA matrix is capable of revealing very significant notes. For instance, perceive response efficiency has the highest importance in research variables to influence the intention to stay home. Thus, decision makers must consider perceive response efficiency more for persuading people to stay home during COVID-19 pandemic.

This study also studied the role of media type delivering the persuasive messages. The findings reveal that the type of media does not influence the intention to stay home. People receive the persuasive messages through diverse kinds of media anyway. People feel the risk, but diverse motives (maybe missing the loved ones or economic problems) force them to go out and not to stay home. More investigations are needed for clarifying this paradox.

References

[1] F. Ahmed, N. Zviedrite, A. Uzicanin, Effectiveness of workplace social distancing measures in reducing influenza transmission: a systematic review, BMC Public Health 18 (1) (2018) 1–13.

[2] H.O. Ahmed, The impact of social distancing and self-isolation in the last corona COVID-19 outbreak on the body weight in Sulaimani governorate-Kurdistan/Iraq, a prospective case series study, Ann. Med. Surg. 59 (2020) 110–117.

[3] M. Alshurideh, B. Al Kurdi, S.A. Salloum, I. Arpaci, M. Al-Emran, Predicting the actual use of m-learning systems: a comparative approach using PLS-SEM and machine learning algorithms, Interact. Learn. Environ. (2020) 1–15.

[4] S.J. Ball-Rokeach, The origins of individual media-system dependency: a sociological framework, Commun. Res. 12 (4) (1985) 485–510.

[5] P.M. Bentler, D.G. Bonett, Significance tests and goodness of fit in the analysis of covariance structures, Psychol. Bull. 88 (3) (1980) 588.

[6] A. Bish, S. Michie, Demographic and attitudinal determinants of protective behaviours during a pandemic: A review, Br. J. Health Psychol. 15 (4) (2010) 797–824.

[7] M.A. Callow, D.D. Callow, C. Smith, Older adults' intention to socially isolate once COVID-19 stay-at-home orders are replaced with "Safer-at-Home" public health advisories: a survey of respondents in Maryland, J. Appl. Gerontol. 39 (11) (2020) 1175–1183.

[8] V.L. Champion, C.S. Skinner, The health belief model, Health Behav. Health Educ. 4 (2008) 45–65.

[9] W. Chaouali, N. Souiden, C.M. Ringle, Elderly customers' reactions to service failures: the role of future time perspective, wisdom and emotional intelligence, J. Serv. Mark. (2020).

[10] J. Cohen, A power primer, Psychol. Bull. 112 (1) (1992) 155.

[11] K.E. Cooper, E.C. Nisbet, Green narratives: how affective responses to media messages influence risk perceptions and policy preferences about environmental hazards, Sci. Commun. 38 (5) (2016) 626–654.

[12] S. Dryhurst, C.R. Schneider, J. Kerr, A.L. Freeman, G. Recchia, A.M. Van Der Bles, S. van der Linden, Risk perceptions of COVID-19 around the world, J. Risk Res. 23 (7–8) (2020) 994–1006.

[13] P. Ebrahimi, M. Ahmadi, A. Gholampour, H. Alipour, CRM performance and development of media entrepreneurship in digital, social media and mobile commerce, Int. J. Emerg. Mark. (2019).

[14] P. Ebrahimi, A. Hajmohammadi, D. Khajeheian, Place branding and moderating role of social media, Curr. Issues Tourism 23 (14) (2020) 1723–1731.

[15] P. Ebrahimi, D. Khajeheian, M. Fekete-Farkas, A SEM-NCA Approach towards Social Networks Marketing: Evaluating Consumers' Sustainable Purchase Behavior with the Moderating Role of Eco-Friendly Attitude, Int. J. Environ. Res. Public Health 18 (24) (2021) 13276.

[16] P. Ebrahimi, S.M. Mirbargkar, Green entrepreneurship and green innovation for SME development in market turbulence, Eurasian Bus. Rev. 7 (2) (2017) 203–228.

[17] P. Ebrahimi, B. Shafiee, A. Gholampour, L. Yousefi, in: Impact of organizational innovation, learning orientation and entrepreneurship on SME performance: the moderating role of market turbulence and ICT *Competitiveness in emerging markets*, Springer, 2018, pp. 447–480.

[18] Ferguson, N., Laydon, D., Nedjati Gilani, G., Imai, N., Ainslie, K., Baguelin, M., Cuomo-Dannenburg, G. (2020). Report 9: Impact of non-pharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand.

[19] A. Gholampour, M.H.M. Jamshidi, A. Habibi, N. Motamedi Dehkordi, P. Ebrahimi, The Impact of Hospital Information System on Nurses' Satisfaction in Iranian Public Hospitals: the Moderating Role of Computer Literacy, J. Inf. Technol. Manag. 12 (4) (2020) 141–159.

[20] J.F. Hair, J.J. Risher, M. Sarstedt, C.M. Ringle, When to use and how to report the results of PLS-SEM, Eur. Bus. Rev. (2019).

[21] J.F. Hair Jr., G.T.M. Hult, C. Ringle, M. Sarstedt, A primer on partial least squares structural equation modeling (PLS-SEM), Sage publications, 2016.

[22] J.F. Hair Jr., G.T.M. Hult, C. Ringle, M. Sarstedt, A primer on partial least squares structural equation modeling (PLS-SEM), Sage Publications, Thousand Oaks, CA, USA, 2016.

[23] J.F. Hair Jr., M. Sarstedt, L.M. Matthews, C.M. Ringle, Identifying and treating unobserved heterogeneity with FIMIX-PLS: part I–method, Eur. Bus. Rev. (2016).

[24] J.F. Hair Jr., M. Sarstedt, C.M. Ringle, S.P Gudergan, Advanced issues in partial least squares structural equation modeling, saGe publications, 2017.

[25] J. Heffner, M.-L. Vives, O. FeldmanHall, Emotional responses to prosocial messages increase willingness to self-isolate during the COVID-19 pandemic, Pers. Indiv. Differ. 170 (2021) 110420.

[26] Heffner, J., Vives, M.L., & FeldmanHall, O. (2020). Emotional responses to prosocial messages increase willingness to self-isolate during the COVID-19 pandemic.

[27] J. Henseler, C.M. Ringle, M. Sarstedt, A new criterion for assessing discriminant validity in variance-based structural equation modeling, J. Acad. Mark. Sci. 43 (1) (2015) 115–135.

[28] S. Hopfer, E.J. Fields, Y. Lu, G. Ramakrishnan, T. Grover, Q. Bai, G. Mark, The social amplification and attenuation of COVID-19 risk perception shaping mask wearing behavior: a longitudinal twitter analysis, PLoS One 16 (9) (2021) e0257428.

[29] T.L. Huynh, The COVID-19 risk perception: a survey on socioeconomics and media attention, Econ. Bull. 40 (1) (2020) 758–764.

[30] E. Janavi, M. Soleimani, A. Gholampour, M. Friedrichsen, P. Ebrahimi, Effect of Social Media Adoption and Media Needs on Online Purchase Behavior: The Moderator Roles of Media Type, Gender and Age, J. Inf. Technol. (2020).

[31] Jordan, J., Yoeli, E., & Rand, D. (2020). Don't get it or don't spread it? Comparing self-interested versus prosocially framed COVID-19 prevention messaging. PsyArXiv.

[32] D. Khajeheian, P. Ebrahimi, Media branding and value co-creation: effect of user participation in social media of newsmedia on attitudinal and behavioural loyalty, Eur. J. Int. Manag. 14 (3) (2020) 254–273.

[33] K.O. Kwok, K.K. Li, H.H.H. Chan, Y.Y. Yi, A. Tang, W.I. Wei, S.Y.S. Wong, Community responses during early phase of COVID-19 epidemic, Hong Kong, Emerg. Infect. Dis. 26 (7) (2020) 1575.

[34] Q. Liao, P. Wu, W. Wing Tak Lam, B.J. Cowling, R. Fielding, Trajectories of public psycho-behavioural responses relating to influenza A (H7N9) over the winter of 2014-15 in Hong Kong, Psychol. Health 34 (2) (2019) 162–180.

[35] Lin, Z., & Meissner, C.M. (2020). *Health vs. wealth? public health policies and the economy during covid-19* (0898-2937). Retrieved from

[36] P.D. Lunn, C.A. Belton, C. Lavin, F.P. McGowan, S. Timmons, D.A. Robertson, Using Behavioral Science to help fight the Coronavirus, J. Behav. Public Admin. 3 (1) (2020).

[37] A. Luttrell, R.E. Petty, Evaluations of self-focused versus other-focused arguments for social distancing: an extension of moral matching effects, Soc. Psychol. Pers. Sci. (2020) 1948550620947853.

[38] L.M. Matthews, M. Sarstedt, J.F. Hair, C.M. Ringle, Identifying and treating unobserved heterogeneity with FIMIX-PLS, Eur. Bus. Rev. (2016).

[39] R. Moffat, C. Yentes, B. Crookston, J. West, Patient Perceptions about Professional Dental Services during the COVID-19 Pandemic, JDR Clin. Transl. Res. (2021).

[40] A. Moghadamzadeh, P. Ebrahimi, S. Radfard, A. Salamzadeh, D. Khajeheian, Investigating the Role of Customer Co-Creation Behavior on Social Media Platforms in Rendering Innovative Services, Sustainability 12 (17) (2020) 6926.

[41] T. Okuhara, H. Okada, T. Kiuchi, Examining persuasive message type to encourage staying at home during the COVID-19 pandemic and social lockdown: a randomized controlled study in Japan, Patient Educ. Couns. 103 (12) (2020) 2588–2593.

[42] B. Paital, K. Das, S.K. Parida, Inter nation social lockdown versus medical care against COVID-19, a mild environmental insight with special reference to India, Sci. Total Environ. (2020) 138914.

[43] S. Pfattheicher, L. Nockur, R. Böhm, C. Sassenrath, M.B. Petersen, The emotional path to action: empathy promotes physical distancing and wearing of face masks during the COVID-19 pandemic, Psychol. Sci. 31 (11) (2020) 1363–1373.

[44] P.M. Podsakoff, S.B. MacKenzie, J.-Y. Lee, N.P. Podsakoff, Common method biases in behavioral research: a critical review of the literature and recommended remedies, J. Appl. Psychol. 88 (5) (2003) 879.
[45] M. Ramaswami, S. Rao, A. Van Der Bliek, R.B. Kelly, K. Krishnan, Genetic studies on dynamin function in Drosophila, J. Neurogenet. 9 (2) (1993) 73–87.
[46] T. Reuter, B. Renner, Who takes precautionary action in the face of the new H1N1 influenza? Prediction of who collects a free hand sanitizer using a health behavior model, PLoS One 6 (7) (2011) e22130.
[47] C.M. Ringle, M. Sarstedt, Gain more insight from your PLS-SEM results, Ind. Manag. Data Syst. (2016).
[48] C.M. Ringle, S. Wende, J.-M. Becker, SmartPLS 3. Boenningstedt, SmartPLS GmbH (2015).
[49] I.M. Rosenstock, Historical origins of the health belief model, Health Educ. Monogr. 2 (4) (1974) 328–335.
[50] T. ROSHANDEL-ARBATANI, H. Kawamorita, S. Ghanbary, P. Ebrahimi, Modelling media entrepreneurship in social media: SEM and MLP-ANN Approach, AD-minister (34) (2019) 35–57.
[51] G.J. Rubin, R. Amlôt, L. Page, S. Wessely, Public perceptions, anxiety, and behaviour change in relation to the swine flu outbreak: cross sectional telephone survey, BMJ (2009) 339.
[52] Sanchez, G. (2013). Pls path modeling with r trowchez editions. Berkeley, CA, USA.
[53] A. Sarkar, L. Qian, A.K. Peau, Structural equation modeling for three aspects of green business practices: a case study of Bangladeshi RMG's industry, Environ. Sci. Pollut. Res. 27 (28) (2020) 35750–35768.
[54] M. Sarstedt, J.F. Hair Jr., J.-H. Cheah, J.-M. Becker, C.M. Ringle, How to specify, estimate, and validate higher-order constructs in PLS-SEM, Aust. Mark. J. (AMJ) 27 (3) (2019) 197–211.
[55] M. Sarstedt, C.M. Ringle, J.F. Hair, Partial least squares structural equation modeling, Handb. Mark. Res. 26 (1) (2017) 1–40.
[56] T. Sharot, The optimism bias, Curr. Biol. 21 (23) (2011) R941–R945.
[57] G. Shmueli, S. Ray, J.M.V. Estrada, S.B. Chatla, The elephant in the room: predictive performance of PLS models, J. Bus. Res. 69 (10) (2016) 4552–4564.
[58] G. Shmueli, M. Sarstedt, J.F. Hair, J.-H. Cheah, H. Ting, S. Vaithilingam, C.M. Ringle, Predictive model assessment in PLS-SEM: guidelines for using PLSpredict, Eur. J. Market. (2019).
[59] P. Slovic, M.L. Finucane, E. Peters, D.G. MacGregor, Risk as analysis and risk as feelings: some thoughts about affect, reason, risk, and rationality, Risk Anal. 24 (2) (2004) 311–322.
[60] D.A. Small, G. Loewenstein, Helping a victim or helping the victim: Altruism and identifiability, J. Risk Uncertainty 26 (1) (2003) 5–16.
[61] M. Sobol, A. Blachnio, A. Przepiórka, Time of pandemic: Temporal perspectives related to compliance with public health regulations concerning the COVID-19 pandemic, Soc. Sci. Med. 265 (2020) 113408.
[62] A. Stapleton, Choosing not to follow rules that will reduce the spread of COVID-19, J. Context. Behav. Sci. 17 (2020) 73–78.
[63] R. Stephenson, T.M. Chavanduka, M.T. Rosso, S.P. Sullivan, R.A. Pitter, A.S. Hunter, E. Rogers, Contrasting the Perceived Severity of COVID-19 and HIV Infection in an Online Survey of Gay, Bisexual, and Other Men Who Have Sex With Men During the US COVID-19 Epidemic, Am. J. Men's Health 14 (5) (2020) 1557988320957545.
[64] J.A. Stolow, L.M. Moses, A.M. Lederer, R. Carter, How fear appeal approaches in COVID-19 health communication may be harming the global community, Health Educ. Behav. 47 (4) (2020) 531–535.
[65] B. Vai, S. Cazzetta, D. Ghiglino, L. Parenti, G. Saibene, M. Toti, F. Benedetti, Risk perception and media in shaping protective behaviors: insights from the early phase of COVID-19 Italian outbreak, Front. Psychol. 11 (2020).
[66] J.J. Van Bavel, K. Baicker, P.S. Boggio, V. Capraro, A. Cichocka, M. Cikara, J.N. Druckman, Using social and behavioural science to support COVID-19 pandemic response, Nat. Hum. Behav. 4 (5) (2020) 460–471.
[67] Wise, T., Zbozinek, T.D., Michelini, G., & Hagan, C.C. (2020). Changes in risk perception and protective behavior during the first week of the COVID-19 pandemic in the United States.