

Health Engagement and Positive Attitude towards COVID-19 Vaccination: Moderating Effect of Character Strengths

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Abstract

Objective: Previous research has shown that health engagement accounts for a substantial variance in positive attitudes about the COVID-19 vaccine in public. However, these studies are hardly able to explain intrapersonal characteristics. Thus, we examined the moderating effect of four character strengths (kindness, critical thinking, fairness, and prudence) in the relation between health engagement and positive attitudes to the COVID-19 vaccine.

Method: The population consisted of all university students living in Mashhad. A sample of 600 individuals was recruited through convenience sampling. The participants completed a battery of questionnaires including a health engagement questionnaire, Values in Action-Inventory of Strengths, and attitudes towards vaccination questionnaire during the COVID-19 pandemic. A hierarchical regression model and slope analysis were used to examine the moderation effect.

Results: The findings indicated a positive and significant correlation between health engagement and a positive attitude towards vaccination ($r=.23$; $p<.01$). The character strengths were significantly and positively associated with health engagement ($r=.18$; $p<.01$), and a positive attitude toward vaccination ($r=.30$; $p<.01$). Moreover, the moderating effect of character strengths on the relationship between health engagement and a positive attitude towards vaccination was significant ($t=-4.08$; $p<.001$).

Conclusion: Therefore, the character strengths could moderate the effect of health engagement on a positive attitude towards vaccination. It can be concluded that character strengths have a moderating effect on making health-related decisions in stressful conditions such as the COVID-19 pandemic.

Keywords: Health engagement, COVID-19 pandemic, Character strengths, Positive attitude to vaccination,.

Introduction

During the COVID-19 pandemic, health workers and policymakers were under a burden to persuade public opinion to vaccinate (Kamkari & Eskandari, 2022). Evidence shows that the rate of vaccine acceptance-even before the COVID-19 pandemic low in Iran and many different countries (Ansari-Moghaddam et al., 2021; Lane et al., 2018).

Previous research indicated that individual health engagement in managing health-related issues might be a significant factor in preventive behaviors such as vaccination (Halvorsen et al., 2020). However, psychological resources like character strengths can moderate the positive effect of health engagement on the positive attitudes toward COVID-19 vaccination. The present study aimed to investigate whether character strengths acted as a facilitator factor to strengthen the impact of health engagement on the positive attitudes towards COVID-19 vaccination.

Health engagement and attitude towards COVID-19 vaccination

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Health engagement is a psychological variable that refers to the degree to which individuals are proactive in managing health-related issues (Halvorsen et al., 2020). Individuals' health engagement can affect preventive behaviors during the COVID-19 pandemic (Castellini et al., 2020; Nania et al., 2020; Graffigna et al., 2020). Previous research indicated a positive and significant relationship between health engagement and attitudes toward vaccination (Graffigna et al., 2020). The positive and significant relationship between positive attitudes toward COVID-19 vaccination with perceived severity and susceptibility was also shown in previous research (Graffigna et al., 2020). Health engagement has a significant relationship with positive attitudes toward vaccination with mediation of perceived severity and susceptibility to COVID-19 (Graffigna et al., 2020). Furthermore, other studies demonstrated that false beliefs, conspiracy theories, and irrational concerns about the effectiveness of vaccination can negatively impact attitudes toward COVID-19 vaccination (Lo et al., 2021; Machida et al., 2021; Murphy et al., 2021). Thus, it seems that some personal psychological characteristics affect health engagement and attitude toward vaccination. *Moderating role of character strengths*

Character strengths are positive and morally valued personality traits and the routes to manifest virtues (Peterson & Seligman, 2004). Twenty-four character strengths are under six universal virtues (Peterson & Seligman, 2004). Previous research demonstrated a positive correlation between character strengths and resilience (Martinez-Marti & Ruch, 2017). The moderating role of character strengths in the relation between perceived stress and depressive symptoms was also indicated among adolescents during the COVID-19 pandemic (Liu & Wang, 2021).

It is documented that individuals with critical thinking are more prone to examine phenomena from all sides and look for evidence to accept any claim (Rashid

& Anjom, 2008). Seeking health information and health-promoting behaviors are among the central components of health engagement (Graffigna et al., 2020). So, critical thinking as a character strength might help individuals better understand the health information about COVID-19 and challenge false beliefs about vaccination.

Kindness as a character strength refers to altruistic love and respect for others (Rashid & Anjom, 2008). The role of empathy and altruism in adherence to lockdown regulations during the COVID-19 pandemic was shown in the previous study (Bellato, 2020). One study demonstrated that resistant and hesitant individuals toward COVID-19 vaccination have lower trust in scientists, more negative attitudes toward migrants, lower levels of altruism, higher levels of social dominance and authoritarianism, and higher levels of conspiratorial beliefs (Murphy et al., 2021). The role of prudence in attitude to vaccination is complicated. Logically, individuals with high prudence could be more prone to take vaccination than others, but prior studies demonstrated that concerns about the severity of adverse events after vaccination are a major driver to postpone vaccination (Carrieri et al., 2021; Chang, 2018; Qian et al., 2020). On the other hand, the perceived risks of contracting the disease during outbreaks encourage vaccination (Oster, 2018; Philipson, 1996). We assume that prudence in combination with other character strengths like critical thinking could make a proper estimation of risk taking without vaccination. Thus, the character strengths of critical thinking, fairness, kindness, and prudence are logically related to health engagement and attitude toward vaccination.

Given the information mentioned above, the main aim of the present study is to examine the mediating role of four character strengths in the relation between health engagement and attitudes toward COVID-19 vaccination (Fig.1).

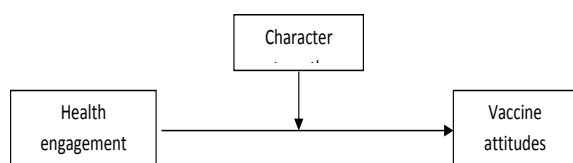


Fig.1. the hypothesized moderating model

Method

Participants

Adequate sample size for moderation analysis was reported around three hundred to six hundred individuals in previous studies (Fritz & MacKinnon, 2007; Sim et al., 2020). However, Hayes (2022) recommends a practical approach to collect as much sample size as the resources allow. Accordingly, with the start of COVID-19 vaccination in 2021, six hundred participants ranging from 18 to 33 (Mean of age=23, SD of age = 2.5; female=453) were recruited from university students living in Mashhad (Iran). All participants signed the consent form and completed the online survey. Seventy-five percent of participants were female, and seventy-three percent of all participants were undergraduate students. The demographic variables are demonstrated in Table 1.

Measures

Checklist of Demographic characteristics

Age, gender and level of education were included in a checklist of demographic characteristics.

Health engagement

Health engagement was measured through a 5-item questionnaire on a 7-point Likert scale developed and used in previous research (Graffigna, Barello, 2018). The measurement showed good reliability and validity in the Iranian population (Changizi, Ghahremani, Ahmadloo Kaveh., 2022). Cronbach's alpha was 0.77 and 0.62 in Italian and Iranian

populations, respectively (Graffigna & Barello, 2018; Changizi et al., 2022). Internal consistency was also acceptable in the present study ($\alpha=0.75$).

Attitudes toward vaccination

Attitudes toward vaccination are assessed with two questions on a 5-point Likert scale from 1 (negative attitude) to 5 (positive attitude). Similar questions in other studies demonstrated good reliability and validity in Italian and Iranian populations (Graffigna et al., 2020; Ansari-Moghaddam et al., 2021). Internal consistency was acceptable in the present study ($\alpha=0.6$).

Character strengths

The VIA-IS was developed by Peterson and Seligman (2004) to measure twenty-four character strengths. Items are rated on a Likert scale ranging from 1 (not at all like me) to 5 (very much like me). It has three versions of 240, 120, and 73 items. The version with 120 items was used in the present study. Four subscales of kindness, critical thinking, fairness, and prudence were used in the present study. Previous research demonstrated good reliability and validity for this measure (McGrath, 2014; Littman-Ovada & McGrath, 2015). Internal consistencies for the subscales of this inventory were 0.75 to 0.85 in previous research (McGrath, 2014; Littman-Ovada & McGrath, 2015). Cronbach's alpha for the subscales was 0.55 to 0.64 in this study.

Analytic strategy

Hierarchical regression was used to examine moderation analysis in past studies (Hayes, 2022; Liu & Wans, 2021). The software of SPSS-24 was utilized to conduct the following statistical analyses. First, descriptive and correlational analyses for

Table1: Demographic variables

	Gender		Education		
	Male	Female	B.A	M.Sc	Ph.D
Frequency	147	453	441	99	60
Percent	24.5	75.5	73.5	16.5	10

Table 1: Mean, standard deviations and bivariate correlations

Study variables	1	2	3	4	5
1.Sex	-				
2.Education	-.30**	-			
3.Health Engagement	.01	-.03	-		
4.Vaccine attitude	-.05	-.02	.23**	-	
5. Character strengths	.05	-.06	.18**	.30**	-
Max	2	3	33	10	100
Min	1	1	7	2	22
M	-	-	20.90	7.0	73.52
SD	-	-	4.40	2.04	12.54

the studied variables were conducted. Second, all continuous variables were standardized to conduct hierarchical multiple regression. Assumptions of regression, including normality, linearity, homoscedasticity, and lack of multicollinearity, were met in the present study. To do hierarchical regression, demographic variables were entered in the first step of the regression model as control variables. The main effects of health engagement and character strengths were entered in the second step. The interactive effect of health engagement and character strengths (health engagement \times character strengths) were entered in the third step. The simple slope analysis proposed by Aiken and West (1991) was also conducted to analyze the moderating role of character strengths.

Results

Preliminary analyses

Descriptive statistics and bivariate correlations of all studied variables are presented in Table 2. There was a significant relationship between health engagement and vaccine attitude ($r=0.23$, $p<0.01$). Character strengths were significantly and positively related to health engagement ($r=0.18$, $p<0.05$) and vaccine attitude ($r=0.30$, $p<0.01$).

Note. $N=600$. Gender was coded 1 for male and 2 for females.

* $p<0.05$. ** $p<0.01$.

Moderating effect of character strengths

The findings of the hierarchical multiple regression analysis (table 2) demonstrated that the interactive effect of health engagement and character strengths

Table 2: Hierarchical regression model for the interactive effect of health engagement and character strengths predicting vaccine attitude

Predictors	Vaccine attitude											
	Model 1($\Delta R^2=.003$)				Model 2($\Delta R^2=.12$)				Model 3($\Delta R^2=.02$)			
	β	SE	t	p	β	SE	t	p	β	SE	t	p
Sex	-.05	.1	-1.32	.18	-.06	.09	-1.53	.12	-.05	.09	-1.34	.17
Education	-.02	.06	-.42	.67	.02	.06	.59	.55	.03	.06	.88	.37
Health engagement					.18	.03	4.86	.001	.19	.03	5.09	.001
Character strengths					.27	.03	6.95	.001	.26	.03	6.72	.001
Health E \times Ch. Strengths									-.15	.03	-4.08	.001

Note. $N=600$.

on vaccine attitude was significant ($\beta = -.15, p < .001$). Green (1991) defines a guideline for a medium effect size of $\Delta R^2 = .07$ in the social and behavioral sciences. Thus, the effect size of predictor variables in the second step is relatively large and in the third step is small. Similar effect sizes for moderation analysis were found in previous research (Bodner, 2017; Liu & Wang, 2021).

To conduct a simple slope analysis, we conducted several steps. First, low levels and high levels of character strengths were defined as 1 SD below and above the mean. Then, we conducted the effects of high levels and low levels of character strengths on the relationship between health engagement and vaccine attitude. The results showed that high levels of health engagement (mean + 1 SD) might be associated with a higher positive attitude to the COVID-19 vaccine in individuals with high levels of character strengths ($\beta = .93, p < .001$) than in those with lower levels of character strengths ($\beta = -.45, p < .001$). Thus, the character strengths might buffer the effect of health engagement on individuals' attitudes toward the COVID-19 vaccine.

As expected, the findings demonstrated that health engagement was significantly and positively associated with a positive attitude towards vaccination. Health engagement, as suggested in a previous study, strengthens positive attitudes towards COVID-19 vaccination (Graffigna et al., 2020). The results of the present study also indicated that four character strengths of fairness, kindness, critical thinking, and prudence were positively and significantly associated with health engagement and positive attitudes about vaccination. Importantly, character strengths moderated the relationship between health engagement and vaccine attitudes. Character strengths are positive psychological traits manifested in thoughts, actions, and feelings (Zhang & Chen, 2018). Based on the broaden and

build theory (Fredrickson, 2001) and the key resource theory (Hobfoll, 2002; Thoits, 1994), positive psychological resources help promote mental health and adaptation to adversities like the COVID-19 pandemic. Prior studies have also indicated that high levels of character strengths were associated with good adaptation to the consequences of lockdown (Bellato, 2020) and depressive symptoms (Liu & Wang, 2021) during the pandemic. Furthermore, it is demonstrated that high levels of character strengths were associated with problem-solving and adaptation abilities (Hellman & Gwinn, 2017; Marco et al., 2016). Consistently, a positive attitude to vaccination could be due to proper adaptation and problem-solving skills.

The present study found that character strengths could moderate the relationship between health engagement and vaccine attitude. Prior studies indicated that all character strengths are significantly associated with positive emotions (Green, 2021; Koch et al., 2020). In the context of the broaden and build model, positive emotions could broaden a momentary supply of thoughts and actions, which in turn, gradually build personal resources in intellectual and psychological aspects. Moreover, the moderating effect of character strengths might be explained through the health behavior model. Based on this model, individuals are likely to take action when they perceive susceptibility or severity of a condition, believe that an available act outweighs the barriers, and the action is known to be beneficial in reducing the risks. The character strengths of critical thinking, fairness, prudence, and kindness might improve the effect of health engagement on vaccine attitude by promoting the perceived susceptibility and severity of COVID-19 conditions and the benefits of vaccination. The results of the present study have some theoretical and practical implications. Our research indicated the facilitating role of character strengths in the relationship between health engagement and a positive attitude towards COVID-

19 vaccination, provides a basis for further relevant studies.

Moreover, our findings have a direct implication for increasing health engagement and positive attitudes towards vaccination through cultivating four character strengths of kindness, fairness, critical thinking, and prudence during COVID-19 or other pandemics. Developing character strengths in the daily file has a facilitating role in following health recommendations.

There are several limitations in the present study. First, a cross-sectional study (like this one) cannot determine the causal relationship between character strengths, health engagement, and attitude toward vaccination. We recommend employing a longitudinal design to examine the moderating effect of character strengths in future studies. Second, the data based on self-reporting can be affected by personal bias. We suggest using the observational method to measure the variables in future studies. Finally, we considered four character strengths in the present research rather than focusing on all character strengths. Although using the four character strengths as study variables has the advantage of shedding light on critical thinking, kindness, prudence, and fairness, the effects of other character strengths should be explored in future studies.

In summary, character strengths as positive characteristics could facilitate the effect of health engagement on the attitude about COVID-19 vaccination. Developing four character strengths of kindness, fairness, critical thinking, and prudence might be a practicable way of facilitating health engagement and a positive attitude to vaccination.

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