





ORIGINAL ARTICLE

Impact of public health education on undue fear of COVID-19 among nurses: The mediating role of psychological capital

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ABSTRACT: This study looked into the mechanism through which health education can reduce the fear of being infected with COVID-19 because health education helps individuals to improve their knowledge and attitudes towards a disease. The spread of COVID-19 has escalated the level of fear among public and nurses. Nevertheless, the mechanism that contributes to minimize the fear towards this pandemic remains unexplored. A cross-sectional survey was adopted to test the relationships among public health education, psychological capital, and fear of COVID-19. In total, 243 responses were obtained via online survey from nurses. The results revealed that public health education can reduce one's fear of COVID-19. Psychological capital emerged as a strong explanatory mechanism for the phenomenon. Drawing on spillover theory, public health education seems to reduce fear of COVID-19 with the mediating role of psychological capital. Limitations and future directions are at the end of this paper. The study outcomes revealed that organizations should focus on educating nursing staff to overcome fear of COVID-19. One way to induce positivity among nursing staff is by holding trainings.

KEY WORDS: fear of COVID-19, psychological capital, public health education.

INTRODUCTION

The COVID-19 outbreak, which started from China in December 2019 (Huang *et al.* 2020), has been an ongoing pandemic that has threatened the world with devastating consequences (Wallace *et al.* 2020). Paules *et al.* (2020) asserted that initially COVID-19 was

perceived as an ordinary form of pneumonia, common cold, or flu; but within months, COVID-19 infected massive number of people and has led many to death. On 30 January 2020, the World Health Organization (WHO) declared public health emergency of international apprehension to countries with susceptible health structures (Sohrabi *et al.* 2020). As of 27 October, more than 1 155 553 people have lost their lives and more than 43 147 494 people worldwide are victims of this pandemic (World Health Organization 2020). The widespread of COVID-19 has threatened many human lives and built high fears in human, especially among healthcare workers (Javadi & Sajadian 2020). Therefore, exceptional and up-to-date health education is crucial for human survival in such stressful environment (Pisal *et al.* 2007).

High fear of COVID-19 increases stress and negative emotions in human lives, especially amidst nurses

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who are taking care of effected patients. As such, this present study proposes that health education is an integral factor to control and reduce fear among nurses. Some reasons that build fear in this context are as follows: getting affected by COVID-19 (Javadi & Sajadian 2020), absence of an effective vaccine, poor medical treatment facilities (Dhama *et al.* 2020), and the rapid spread of COVID-19 (Chinazzi *et al.* 2020). Due to fear of catching the disease and unavailability of resources, healthcare workers including nurses face certain psychological disorders, including stress, alcohol abuse, insomnia, phobia, anxiety, and post-trauma stress (Satici *et al.* 2020).

Nurses are at high risk of catching infection. This pressure is due to the number of deaths among healthcare workers. Based on the recent data from the National Emergency Operations Center, at least 31 healthcare workers, including 20 doctors, one medical student, two nurses, and eight allied staff, have lost their lives fighting COVID-19 in Pakistan (Anadolu Agency 2020). This increasing death rate among doctors, nurses, and paramedical staff due to COVID-19 can cause fear among healthcare workers (Natasha, Mansoor & Junaid 2020). Healthcare workers have closer contact with COVID-19 patients, thus a reason for their greater stress level than the public (Neto *et al.* 2020). However, if nurses have better knowledge and education to cope with the pressing situation, fear of COVID-19 can be minimized. This present study proposes psychological capital as the mediating mechanism between health education and fear of COVID-19. In the light of positive organizational behaviour, psychological capital is a personality construct and refers to 'one's positive psychological state of development' (Luthans *et al.* 2007). When individuals have high psychological capital, they can easily cope with stressful environment (e.g., nurses dealing with COVID-19 patients) and take it as challenge (Karatepe & Avci 2017). Therefore, this present study proposes health-related education reduces fear of COVID-19 in nurses through positive psychological capital.

PROPOSED HYPOTHESES

Through the lens of spillover theory (Jacobs *et al.* 1969), the current study proposed the following hypotheses:

H1: Public health education significantly reduces the fear of COVID-19 among nurses

H2: Psychological capital mediates the relationship between public health education and fear of COVID-19

LITERATURE REVIEW

Public health education and fear of COVID-19

Public health education refers to educating people about health issues (McKenzie *et al.* 2009). Yanovitzky *et al.* (2005) grouped 69 statements into 14 public health education elements, which included positive and active engagement in life, health-directed behaviour, skill and technique acquisition, constructive attitudes and approaches, self-monitoring and insight, health services navigation, social integration, support, and emotional well-being. Many researchers have highlighted the importance of public health education in addressing the consequences and the impact of diseases. It also helps to improve the recovery conditions of patients (Ahmad Sharoni *et al.* 2016; Freudenberg 2005; Nutbeam 2000; Yanovitzky *et al.* 2005), as Jordan *et al.* (2008) clearly suggested public health education helps to manage the spread of diseases. On the base of these studies, we assume that public health education may reduce fear of COVID-19 among nurses that would be tested in this study.

Moreover, in the current COVID-19 pandemic nurses play crucial role to serve the affected peoples. Unfortunately, nurses are becoming fearful due to the rapid spread of COVID-19 and the increasing number of death tolls has triggered fear and panic across the globe, but this needs empirical evidence, because doctors and nurses were refrained to go to their homes in order to stop the spread of COVID-19 (Shigemura *et al.* 2020). Wells and Sturm (1995) claimed that when living environment changes, people become anxious and fearful. It is alarming to read news that several suicidal cases have been reported in several countries due to the fear of outbreak (Kelvin & Rubino 2020). Managing mental health of nurses is an immediate need (Xiang *et al.* 2020), which may be made possible by educating them. In the current COVID-19 crisis, the world needs fearless nurses, to help and take care of affected people. More interestingly if in this situation, nurses become affected due to fear of COVID-19, it will also affect the general public as well. Therefore, the current study proposes that,

H1: Public health education can help to reduce the fear of COVID-19 among nurses

Psychological capital as a mediator

In order to minimize the fear of COVID-19 among nurses, we proposed psychological capital as a mediator, as Youssef and Luthans (2007) examined that psychological capital emphasizes on human strength and positive psychological state, which can help individuals to strive and succeed. Psychological capital is characterized by four psychological features, namely optimism, resilience, hope, and self-efficacy (Luthans *et al.* 2007). The first attribute is optimism, which is defined as a psychological attribute that reflects the favourable and positive expectations of individuals regarding their future (Carver *et al.* 2010). The second attribute, resilience, is about coping and adaptation abilities of individuals towards difficulties and risks (Luthans & Youssef 2004). The third attribute, hope, is related to the expectations of individuals that motivate them to put more effort to attain their goals (Luthans & Youssef 2004). According to Bandura (1997), the fourth attribute of psychological capital called self-efficacy is related to one's belief in his/ her abilities to perform specific tasks. These four attributes may help to reduce fear of COVID-19 among nurses.

Moreover, we build argument on spillover theory, in the current COVID-19 Pandemic, public health education may help to increase psychological capital and ultimately it may reduce fear of COVID-19 among nurses, as previous researchers stated that psychological capital helps to reduce anxiety, stress, and depression (Guo *et al.* 2018; Luthans & Youssef 2004; Raja *et al.* 2020). Thus, we assume that the psychological capital may reduce fear in the current pandemic. Moreover, Yim, Seo, Cho, and Kim (2017) proposed that psychological capital may be developed through contextual or situational variables. Thus, based on the built arguments the current study proposed public health education may help to improve the psychological capital among nurses.

Based on the above discussion, this study hypothesized that,

H2: Psychological capital mediates the relationship between public health education and fear of COVID-19

METHODOLOGY

The population of this study included nurses from two major cities located in Pakistan: Rawalpindi and

Islamabad. The exact number of the population is unknown, especially nurses who are attending COVID-19 patients. Hence, a non-probability sampling technique (i.e. purposive sampling technique) was performed to collect accurate and fair data for the study. A comprehensive procedure was adopted, and all authors were involved for data collection. First, we secure ethical approval from institution (Departmental Ethics Review Committee, Capital University of Science and Technology, Islamabad Pakistan), and then, we approached the hospital heads through personal references to fix an online meeting. During the meeting, the study objectives were presented for ethical permission, while assuring that the study was voluntary and all data will be treated confidentially throughout the research phase. As a result, the hospital heads agreed and helped to provide the email addresses of their nurses who were treating COVID-19 patients. Finally, the human resource department shared the identity of those nurses who were engaged with COVID-19 Patients.

Furthermore, we approached the targeted respondents and emailed a cover letter along with questionnaires; in the cover letter, we briefly explained the introduction of the authors and their institution, and then, we clearly explained the study objectives and nature of the study (i.e. voluntary study). Moreover, they were assured that their responses would be kept strictly confidential and not revealed, and lastly, we mentioned that if you voluntarily agree to participate, please fill the attached questionnaires. We emailed questionnaire to 400 nurses, only 265 nurses completed the questionnaire, and 39 responses were discarded due to missing values (e.g. if some respondents did not mention about demographic variables or any other scale item, then they were excluded from final analysis). Finally, 243 were considered for further analysis. Moreover, to confirm the sample size adequacy, we used G*power analysis, designed by Faul *et al.* (2009). And the result displayed minimum 113 sample size that is less than our actual sample; thus, our sample size is justified. Finally, the gathered data were then imported to Excel sheet and later exported to SPSS for further analysis. The response rate was 66%, which is justifiable in the Pakistani context (Khan *et al.* 2020). Among the participants, 39% were males and 61% were females. In total, 64% of them had nursing diploma and the rest held bachelor's degree in nursing, 43.7% of the nurses were between 22 and 29 years of age, 42.2% were between 30 and 39 years of age, 14.1% were between 40 and

49 years of age, and the remaining 3.4% were equal and above 50 years of age.

MEASUREMENTS

The study variables were measured on a five-point Likert scale, the interpretation of the fear of COVID-19 was measured on a scale (1 = not at all, 5 = very much), and public health education and psychological capital were measured on a scale (1 = Strongly Disagree, 5 = Strongly Agree). Questionnaires were adapted and distributed in the English language. The vast majority of employees in Pakistan have functional knowledge of English. Earlier studies have also collected data in English and did not face any language issues (Irshad, Khat-tak, Hassan, Majeed, & Bashir 2020).

Health Education Impact Questionnaire

The 42-item survey by Osborne, Elsworth, and Whitfield (2007) measured using five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) was adapted to test the impact of public health education. Sample items of the survey include 'I do at least one type of physical activity every day for staying healthy in this pandemic', 'My health problems do not ruin my life', and 'I get my needs met from available healthcare resources'.

Fear of COVID-19

The fear of COVID-19 was measured using a 10-item survey developed by Ruiter *et al.* (2001) for breast self-examination. The survey items were modified to suit the present study objectives within the context of Pakistan. Some of the items are 'I feel relaxed (in the present COVID-19 outbreak worldwide)', 'I feel uncomfortable (in the present COVID-19 outbreak worldwide)', and 'I feel nervous (in the present COVID-19 outbreak worldwide)'.

Psychological capital

The 24 items devised by Luthans *et al.* (2007) were adapted to test psychological capital on 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Some sample items include 'I feel confident analyzing a long-term problem to find a solution', 'If I should find myself in a jam, I could think of many ways to get out of it', and 'I usually manage difficulties one way or another during training'.

Control Variables

The one-way ANOVA revealed no significant effect of the demographics on fear of COVID-19 with the following values: employee's gender ($F = 0.34, P > 0.05$), age ($F = 0.41, p > 0.05$), qualification level ($F = 0.19, P > 0.05$), and experience ($F = 0.63, P > 0.05$).

STATISTICAL PLAN

We performed a number of statistical tests to analyse the data. Firstly, we ran confirmatory factor analysis (CFA) to ensure that the factor structure of our data is consistent with the theoretical model. Secondly, we used composite reliability and average variance, extracted to ensure the discriminate and convergent validity. In order to examine the relationships among the proposed variables, we tested and analysed descriptive statistics, Pearson's correlation, and mediation by using Preacher and Hayes (2005), model 4 of process macros.

MEASUREMENT MODEL

The CFA of all the three constructs (public health education, psychological capital, and fear of COVID-19) was determined to identify the fitness of the hypothesized 3-factor model prior to testing, directing, and mediating the correlations. Based on Table 1, the 3-factor model did display fitness (CFI = 0.905, IFI = 0.906, TLI = 0.902, RMSEA = 0.032). The loadings of all items were well above 0.4, which is the satisfactory criterion. Table 1 also shows that the proposed two- and one-factor models depict poor fit with the dataset.

CORRELATION ANALYSIS

The correlation analysis presented in Table 2 exemplifies that public health education has a significant and positive correlation with psychological capital ($r = 0.40, P < 0.001$), but significantly negative relationship with fear of COVID-19 ($r = -0.39, P < 0.001$). Meanwhile, psychological capital displayed a significantly negative correlation with fear of COVID-19 ($r = -0.34, P < 0.001$).

CONVERGENT AND DISCRIMINANT VALIDITY

The construct, convergent, and discriminant validity had been measured using composite reliability (CR) and average variance extracted (AVE). The results

TABLE 1: *Confirmatory factor analysis*

Models	Factors	χ^2	df	RMSEA	IFI	TLI	CFI
Hypothesized model	Three-factor model	1724.4132**	831	0.032	0.905	0.906	0.902
Two-factor model	Two factors	3224.653**	719	0.075	0.811	0.813	0.806
All in one factor	Single-factor model	4233.544**	874	0.088	0.690	0.693	0.681

N = 243; * $P < 0.05$ ** $P < 0.01$, χ^2 = chi-square df, degree of freedom; CFI, Comparative Fit Index; TLI, Tucker–Lewis index; IFI, Incremental Fit Index; RMSEA, root-mean-square error of approximation.

TABLE 2: *Correlation, descriptive analysis, and alpha reliabilities*

Variable	Min	Max	Mean	SD	CR	AVE	MSV	α	1	2	3
1 Public health education	2.31	4.60	2.82	0.455	0.92	0.57	0.12	0.90	–		
2 Psychological capital	1.40	4.80	3.14	0.636	0.88	0.52	0.24	0.87	0.40**	–	
3 Fear of COVID-19	1.50	4.25	3.41	0.727	0.80	0.51	0.17	0.79	–0.39**	–0.34**	–

N = 243; * $P < 0.05$; ** $P < 0.01$; CR, composite reliability; AVE, average variance extraction; MSV, maximum shared variance; SD, standard deviation; Min, minimum; Max, maximum; α , alpha reliabilities.

tabulated in Table 2 show that the CR values for all the three variables exceeded the threshold value of 0.70 for CR. The average variance extracted (AVE) values must be >0.50, but the AVE results for the three variables were >0.50. Therefore, the AVE and CR values are above threshold and confirmed the convergent validity. Moreover, the maximum shared variance (MSV) values of three variables were less than their AVE values, showing the presence of discriminant validity, results presented in Table 2.

HYPOTHESES TESTING

Direct and Indirect Effects

Table 3 presents the direct and mediation analysis results. Upon adhering to Preacher and Hayes (2005), model 4 of process macros was used to test the proposed hypotheses. The first hypothesis (H1) of this study proposes that public health education is

negatively associated with fear of COVID-19. After controlling the effect of gender and age, the direct effect of public health education was significantly negative on the fear of COVID-19 ($\beta = -0.50, P < 0.001$), which led to the acceptance of Hypothesis 1.

The second hypothesis (H2) of this study proposes that psychological capital mediates the relationship between public health education and fear of COVID-19. The assumption of the mediation was satisfied, as public health education exhibited a significantly positive effect on psychological capital ($\beta = 0.56, P < 0.001$), while psychological capital showed a significantly negative effect on fear of COVID-19 ($\beta = -0.24, P < 0.001$). The indirect effect of public health education on fear of COVID-19 through the mediation of psychological capital with bootstrapping results revealed significantly negative effect (indirect effect = $-0.13, 95\% \text{ LLCI} = -0.24, 95\% \text{ ULCI} = -0.04$). Hence, the results confirm that public health education can improve psychological capital, and

TABLE 3: *Direct and indirect effect*

Direct effect	Estimate	SE	t
Public health education → Fear of COVID-19	–0.50**	0.10	–4.93
Public health education → Psychological capital	0.56**	0.08	6.84
Psychological capital → Fear of COVID-19 (95% bias-corrected confidence interval method)	–0.24**	0.07	–3.33
Indirect effect	Effect	S.E	LL, –UL
Public health education → Psychological capital → Fear of COVID-19	–0.13**	0.05	–0.24, –0.04

N = 243, * $P < 0.05$; ** $P < 0.01$; LL, lower limit; SE, standard error; UL, upper limit.

psychological capital can decrease fear of COVID-19. These results lead to the acceptance of Hypothesis 2 proposed in this study.

DISCUSSION

The findings revealed strong empirical support to the theoretical assumptions. First, the results showed that public health education significantly reduced the fear of COVID-19 among nurses through health education. This outcome is in line with that reported by Stolor, Moses, Lederer, and Carter (2020). The result is an extension of that depicted by Bibi (2019), whereby awareness of basic health issues, such as hypertension, cholesterol, and cardiovascular disease, can reduce the risk of one's vulnerability towards these diseases. Similarly, awareness of the recent COVID-19 pandemic has enabled the general public and healthcare workers to realize that preventive measures can indeed work effectively.

According to Haack *et al.* (2019), guideline awareness and knowledge in several domains (i.e. healthcare system, own physical condition, psychological capital, and dealing with health problems) can be helpful in COVID-19 eradication. Therefore, the Ministry of Health, along with the management of leading hospitals, should organize awareness programs so that sufficient knowledge can be disseminated to nurses in the battle with coronavirus. The WHO asserted that health education serves as a mechanism of sharing learning experiences with individuals and communities to influence their attitudes and behaviour for their welfare and well-being. The fear of falling ill or catching the disease is not easy to absorb (Minkyung & Dukyoo 2020). In Pakistan, the nurses appear to be aware of the essential health prerequisites (e.g. sanitization, and use of protective gloves and gowns) and take precautionary measures by using eye/face protection shields, goggles, and National Institute for Occupational Safety and Health (NIOSH)-certified disposable N95 filter face piece respirators. These had somewhat diminished their fear of COVID-19. As such, it is proposed that public health education and psychological capital serve as helping mechanism to reduce the fear of COVID-19.

Similarly, the results exhibit strong support for hypothesis two (the role of psychological capital as a mediator between health education and fear of COVID-19). Basic health awareness builds psychological capital in the form of positivism, hope, efficacy, and resilience in individuals, thus making them self-

sufficient to respond to specific issues. Furthermore, psychological capital improves well-being (Hernández-Varas *et al.* 2019). Education aims to develop human capital, such as psychological capital, self-efficacy, optimistic outlook, and resilience (Luthans *et al.* 2007) which in return helps to reduce the fear of COVID-19, because psychological conditions of an individual help to reduce fear (Han 2020).

Psychological capital indicates the defence mechanism of human beings, which is strengthened by their awareness of general health issues, thus making them capable to respond effectively. In agreement with previous studies (Carmona-Halty *et al.* 2019; Luthans *et al.* 2019), the present findings revealed that psychological capital is the ultimate choice – an effective explanatory mechanism that delivers as much as it receives. Once psychological capital is strengthened through knowledge and awareness, desirable outcomes are reaped. Thus, this present study justifies the assumptions of spillover theory as well, mainly because knowledge, courage, positivism, and resilience displayed spillover effect on unlimited positive outcomes. Knowledge and awareness lead individuals to live better and to strive better.

Limitations and Future directions

The COVID-19 pandemic will continue to affect our lives for the coming few years. Thus, it is important to increase public health awareness among nurses. Most of the developing countries are already in problem due to limited health facilities. However, one cannot deny that nurses tend to start with better health knowledge than the rest of the population. Although this present study targeted all sectors to gain genuine feedback, unfortunately the response was poor due to small sample size. This calls for future studies to increase the sample size to generalize the results. Additionally, this study only emphasized on one variable, while future work may work with multiple outcomes and several other mediating variables, including well-being, culture, beliefs, knowledge, risk communication, trust, work environment, negative emotions, anxiety, and burnout. Essentially, there are many other factors other than those assessed in this study, which can be studied in the future.

CONCLUSION

The COVID-19 pandemic has adversely affected the mental health of healthcare individuals. They are becoming more anxious and fearful about its dreadful

effects. This study proves that the fear of COVID-19 can be reduced significantly by spreading awareness and educating nurses in Pakistan. The study outcomes revealed that public health education can exert a positive influence on reducing the fear of COVID-19. Additionally, psychological capital helps to lower this fear by acting as a mediator. The spillover theory strongly supports this model. In the light of this study, it can be assumed that countries can opt to address this issue by spreading awareness. This is because countries that have spread awareness through education have successfully coped with this deadly disease. Researchers also need to explore other factors that can influence nurses to reduce the fear towards COVID-19, such as work environment, poverty, and trust.

IMPLICATIONS

In the midst of COVID-19 pandemic, updated health knowledge is crucial for survival, especially among healthcare workers attending COVID-19 patients. Hence, it is essential for the nursing management to educate and equip nursing staff with the complete details of COVID-19. It helps to secure them and others on how they can avoid this disease by taking necessary measures, thus indirectly reducing the fear of infection. As fear destroys human psychological well-being, the nursing management must frequently update and share knowledge about COVID-19. Lockdown and restricted gatherings have psychologically affected many, including nurses. However, adequate knowledge in tackling infection can help reduce fear. Building psychological capital via training, counselling, and education can help the nursing management to maintain the attendance and moral among nursing staff to survive the pandemic and save others as well.

ETHICAL APPROVAL STATEMENT

Obtained (shared with the editor).

INFORMED CONSENT

Consent was obtained.

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