

Optimism Bias, Fear, and Compliance with COVID-19 Related Protective Behaviors Among Healthy and Diabetic Young Adults

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On March 11th, 2020, COVID-19 was declared a pandemic; and caused more than 4 million deaths worldwide. In Pakistan, government efforts to minimize the spread of disease emphasized protective behaviors including social distancing, hand washing, self-isolation, and seeking medical attention if experiencing symptoms. However, the local populace remained largely disengaged, seemed unaware, and failed to adhere to official preventive guidelines from the government. This study investigated the relationship among optimism bias, fear of COVID-19, and compliance with COVID-19-related protective behaviors among a sample of healthy and high-risk young adults diagnosed with Type 1 Diabetes. Fifty healthy and 50 diabetic young adults aged 18-23 years were administered the Optimism Bias Measurement (Druică et al., 2020), Fear of COVID-19 Scale (Ahorsu et al., 2020), and the Preventive COVID-19 Infection Behavior Scale (Chang et al., 2020). The results revealed that optimism bias had a significant negative, and fear of COVID-19 had a significant positive correlation with compliance with COVID-19-related protective behaviors. Moreover, healthy young adults had significantly higher optimism bias, but lower fear and compliance as compared to diabetic young adults. Overall, the findings will facilitate public health policymakers and social scientists to better understand the factors that can influence compliance with preventive protocols enforced against the pandemic in Pakistan.

Keywords. Healthy young adults, type 1 diabetes, optimism bias, fear of COVID-19, compliance with protective behaviors

Being hailed as one of the greatest humanitarian crises since World War II, the COVID-19 pandemic had an impact on nearly all aspects of global societies across 220 countries, including over 200

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million confirmed cases and 4.84 million related deaths worldwide. A brief look over the near past in the 20th and 21st centuries reveals that different governments have always necessitated protective measures to combat similar pandemics. Fortunately, such preventive procedures have been factually proven as effective steps in releasing some burden off the healthcare systems by containing the spread of the virus (Balinska & Rizzo, 2009). Similarly, at the onset of the Coronavirus, Pakistan's government too continued to enforce precautionary protocols, including social distancing, hand washing, self-isolation, and seeking medical attention if experiencing symptoms.

The effectiveness of preventive measures enforced against a pandemic by any government depends on the degree to which people comply with such measures. However, significant differences in the extent of compliance have been observed among various groups. Most importantly, research has identified young adults as a group that exhibits relatively lower compliance to health provisions proposed to limit and regulate the spread of the virus, especially in the case of social distancing (Barari et al., 2020; Cohen et al., 2020; Park et al., 2020a; Roy-Chowdhury et al., 2020). In mid-March 2020, a vital appeal by the 'World Health Organization' (WHO) requested increased compliance with safety measures by young adults (Nebehay, as cited in Nivette et al., 2020). The appeal was pivotal because although, young adults may often show none to minor symptoms of COVID-19 (Center for Disease Control & Prevention [CDC], 2020; Pan et al., 2020), yet the likelihood of them spreading the virus remains high as they have relatively larger social circles and considerably are active socially (Andrews et al., 2020; Cohen et al., 2020; Wrzus et al., 2013).

To explain differences among the compliance-related behavior of various individual groups, research has identified some factors. Based on research evidence, a higher degree of compliance with safety protocols in individuals can be attributed to their higher levels of perceived susceptibility of getting sick, anxiety, perceived severity of the disease, and confidence in the effectiveness of protective behaviors (Bish & Michie, 2010). To put it simply, individuals' compliance with safety measures against health risks is determined by their cognitive and emotional responses. Many theories, including the 'health belief model' (Hochbaum et al., as cited in Alsulaiman & Renter, 2018), 'protection motivation theory' (Rogers, 1975, 1983), 'the extended parallel process model' (Witte, 1992), 'the prime theory of motivation' (West & Michie, 2019), and 'the theory of planned behavior' (Ajzen, 1985) describe how people change their behaviors in response to a health threat. In summary, these theories propose that an

individual engages or complies with health-related safety measures when they assume a certainly high susceptibility to that disease, have anxiety about the threat, perceive that the threat is severe, weigh the costs and benefits of adopting and performing a precautionary behavior and evaluates their ability to cope with a threat. These theories suggest that cognitive and emotional responses determine the behavioral changes produced in response to a health threat.

It is worth pointing out that the aforementioned theories identify one's perceived susceptibility to disease: the belief that one is likely to be infected as a crucial component of health-related behavioral changes. However, intriguingly, a cognitive mechanism known as the Optimism Bias can impede such threat appraisals fairly. Optimism bias, a concept first demonstrated by [Weinstein \(1980\)](#), is referred to as "one's tendency to believe that the self is less likely to go through negative events, as compared to an average person." Optimism bias is also referred to as a "cognitive bias where some people believe that they are less likely to experience negative events than positive events."

Optimism bias manifests that individuals often misconstrue their risk assessment of self-versus others. They estimate their own risk or vulnerability to the disease to be much lower than that of others. This is particularly evident in how people underrate the chances of being infected in the case of health threats, such as a pandemic. A study on optimism bias with respect to COVID-19 showed that in the U.K., adults generally underestimated their chances of experiencing COVID-19-related risks compared to the possibilities for other people of the same age and gender ([Asimakopoulou et al., 2020](#)).

Optimism bias, a tendency to perceive one-self as less susceptible to negative experiences or events might result in very disadvantageous outcomes, especially in the case of high-risk situations such as a pandemic. Research completed in Mexico on young adults who have asthma revealed that those who perceived themselves as less likely to get infected with COVID-19 were also accordingly less likely to adhere to preventive guidelines for COVID-19 ([Vázquez-Nava et al., 2020](#)). Similarly, a recent study in the USA investigated optimism bias's role in information-seeking intentions and behavioral responses during COVID-19. This study revealed a negative correlation between optimism bias and risk perception and a positive correlation between risk perception and affective risk responses, that is, fear and worry ([Park et al., 2020a](#)).

The optimism bias stems from its potential benefits for mental well-being; it is associated with happiness, contentment, better

performance, persistence, increased motivation, and greater success (Taylor & Brown, 1988). On the other hand, in situations of health threat such as a pandemic, optimism bias or people's belief that they are less likely to get infected with the virus can play a detrimental role as it might keep them from actively complying with health-related protective behaviors (Bränström et al., 2005; Weinstein & Lyon, 1999). Even during the current pandemic, an abundance of research has shown that individuals who underestimate their personal risk of catching an infection tend to comply less with protective behaviors (Dryhurst et al., 2020; Fragkaki et al., 2021; Park et al., 2020b; Wise et al., 2020).

While understanding the role of optimism bias in compliance-related behavior in people, it is imperative to mention its negative relation with the emotion of fear. Fear of COVID-19 is defined as a natural emotional response toward the high transmission, infection, and mortality caused by COVID-19 virus (Ahorsu et al., 2020). Lench and Levine (2005) conducted a study on undergraduate students to investigate the relationship among emotions, risk judgment, control, and memory and found that the presence of fear decreased optimism bias to a certain extent. This result was further validated as research by Dewberry et al. (2010) also found an inverse relationship between the two. Historically, fear has been thought of as a motivational stimulator or an affective response against danger, real or perceived (Rogers, 1975). Moreover, fear is viewed as an evolutionary adaptive emotional response that instigates a survival instinct by prompting appropriate safety responses in dangerous situations (Olsson & Phelps, 2007). Therefore, in a high-risk situation such as a pandemic, fear in an individual is normative, widespread, expectable, and understandable (Shultz et al., 2016). As people tend to retain fearful messages for a long (Hale & Dillard, 1995; Schneider et al., 2001; Sturges & Rogers, 1996), the health domain continues to make use of fear appeals to increase people's awareness of their vulnerability and hence, to persuade them accordingly to control their behavior. More importantly, a recent study has also highlighted the functional role of fear with regards to the increased adoption of safety measures during COVID-19 (Harper et al., 2021). However, fear closely relates to or eventually culminates in anxiety as an emotional response when the threat is perceived as uncontrollable and unavoidable (Öhman, 2000).

In addition to the presence of fear, personal experiences of negative events in life also affect the degree of optimism bias in people. Laventhal (1975, as cited in Taylor, 1983) proposed that a "sense of personal control," an essential factor of the optimism bias, is likely to be shattered by a presence of an illness. Similarly, several

other studies suggest that individuals having past personal experience with threats such as problems with one's health (Weinstein, 1987), natural disasters (Burger & Palmer, 1992; Helweg-Larsen, 1999), and road accidents exhibit less optimism bias (Mckenna & Albery, 2001). The findings remain persistent even in the present age, as during COVID-19, an abundance of research found that individuals with pre-existing medical conditions reported higher levels of perceived risk and worry (Alonzi et al., 2020; Malesza & Kaczmarek, 2020) and exhibited lower levels of optimism bias and resultantly engaged in increased compliance with the relevant safety protocols (Camacho-Rivera et al., 2020; Joensen et al., 2020; Korajlija & Jokic-Begic, 2020; Özdin & Özdin, 2020; Pal et al., 2020; Wu et al., 2021).

During the current pandemic in Pakistan, the question of whether there are any differences in the extent to which young individuals with or without pre-existing medical conditions exhibit optimism bias, fear, and compliance with preventive protocols becomes relevant. Research identifies young adults as a group demonstrating fewer adherences to safety protocols. However, the CDC (2020) has declared that individuals of any age with a certain underlying or pre-existing medical condition, such as lung disease or diabetes, are at a greater risk of experiencing dire complications if they catch the Coronavirus. This should not be confused with the statement that people with such underlying conditions are more likely to catch the virus. If they do catch it in the first place, their complications might be disastrously adverse compared to someone without such an underlying condition. However, CDC (2020) has also mentioned that the COVID-19 infection and its potential complications can be prevented through active compliance with protective guidelines.

Detailed and sound empirical research has helped us identify the relationship between optimism bias, fear, and compliance with preventive measures, however, to the best of our knowledge, the available literature in the context of Pakistan does not show research conducted on these variables altogether and that too more specifically on both healthy and high-risk diabetic young adults. Therefore, it becomes imperative to study and understand factors that can influence compliance with the preventive protocols enforced against the pandemic in Pakistan. Moreover, the sample of young adults was chosen keeping in view that due to the overemphasis of media on age and vulnerabilities of the elderly population, a framing effect among young adults might play an essential role in shaping their opinion and influencing their behavior regarding compliance with protective behaviors during the current pandemic. The purpose of this study was to add to study the role of optimism bias and fear in relation to

compliance with COVID-19-related protective behaviors and examine differences between these variables across healthy and high-risk young adults diagnosed with Type 1 Diabetes.

Hypotheses

1. Optimism bias with respect to COVID-19 has a negative relationship with compliance with COVID-19-related protective behaviors in young adults.
2. Fear of COVID-19 is positively related to compliance with COVID-19-related protective behaviors.
3. There is a negative correlation between fear of COVID-19 and optimism bias related to COVID-19.
4. Healthy young adults have a significantly higher optimism bias as compared to young adults with Type 1 Diabetes.
5. Fear of COVID-19 and compliance with COVID-19-related protective behaviors are significantly lower in healthy young adults than in young individuals with Type 1 Diabetes.

Method

This was a cross-sectional study that employed a quantitative research method. This study examined optimism bias and fear with respect to COVID-19, as well as evaluated their relationship with compliance to protective behaviors between the two sample groups: healthy young adults and young adults diagnosed with Type 1 Diabetes. Research consisted of following two phases:

Phase 1

Phase 1 was the pre-testing of the study measures with an aim to assess the participants' comprehension and understanding of the scale items. Ten participants currently enrolled in undergraduate degree programs (with age ranging from 18 to 23 years) were approached during the third wave of Coronavirus. They were requested to highlight any items / terms that were difficult to understand so that timely modifications could be made prior to the main study. All of them reported having complete understanding of the items of study measures.

Phase 2

Phase 2 was the main study conducted to test the hypotheses of the research.

Sample

Two samples were chosen for this research via purposive sampling. The first sample of young individuals diagnosed with Type 1 Diabetes consisted of 50 participants (men = 15, women = 35) with a mean age of 21.1 years ($SD = 1.59$). This sample was drawn from a private clinic, in Lahore. The second sample of healthy young adults ($n = 50$; men = 17, women = 33) enrolled university students, with a mean age of 20.6 years ($SD = 1.41$), was drawn from a private university in Lahore. To ensure homogeneous sampling, participants in both sample groups were selected if they had completed or were currently enrolled in an undergraduate degree program and had a middle or upper-middle socio-economic status. Individuals diagnosed with Type 1 Diabetes were considered a high-risk group in this study. Moreover, young individuals without any pre-existing physical or psychiatric illness and diabetic adults without any comorbid physical conditions were included in the study. Young adults who were married, had already contracted the COVID-19 infection at least once and/or had an immediate family member who contracted the COVID-19 infection were excluded from the present study.

Table 1 shows that the majority of the participants are women, currently enrolled in bachelor's degree Program, and belong to the nuclear family system among both groups of healthy and diabetic individuals. Majority of participants from both groups report having a relative in the family tested positive for COVID-19.

Table 1
Demographic Characteristics of Participants (N=100)

Characteristics	Diabetic	Healthy
	Young Adults ($n = 50$)	Young Adults ($n = 50$)
	n (%)	n (%)
Age (range = 18-23 years)	-	-
Gender		
Men	15 (30%)	17 (34%)
Women	35 (70%)	33 (66%)
Education		
University Graduate	18 (36%)	7 (14%)
Currently enrolled in bachelor's degree Program	32(64%)	43(86%)
Monthly Income		
50,000-100,000	12 (24.0%)	6 (12.0%)
100,000-200,000	26 (52%)	24(48%)

Continued...

Characteristics	Diabetic Young Adults (n = 50)	Healthy Young Adults (n = 50)
	n (%)	n (%)
200,000-300,000	12 (24.0%)	20 (40%)
Above 300,000	-	-
Family Structure		
Nuclear	39 (78%)	41 (82%)
Joint	11 (22%)	9 (18%)
Psychological illness		
Yes	-	-
No	50 (100%)	50 (100%)
Presence of any other Physical illness		
Yes	-	-
None Other than Diabetes	50 (100%)	50 (100%)
Psychotropic medication		
Yes	-	-
No	50 (100%)	50 (100%)
Have you ever contracted or tested positive for COVID-19?		
Yes	-	-
No	50 (100%)	50 (100%)
Has any of your family members contracted or tested positive for COVID-19?		
Yes	-	-
No	50 (100%)	50 (100%)
Has any of your relatives contracted or tested positive for COVID-19?		
Yes	40 (80%)	41 (82%)
No	10 (20%)	9 (18%)

Instruments

Demographic Information Questionnaire. A demographic information questionnaire was provided to gain information about sociodemographic variables. The questionnaire also included questions that asked the participants if they suffered from any other physical or mental illness if they knew about COVID-19 and if they or their immediate family members had ever contracted COVID-19.

Optimism Bias Measurement. Optimism bias was measured using the “Optimism Bias Measurement” developed by [Druică et al. \(2020\)](#), which assesses optimism bias concerning one’s perceived susceptibility of contracting COVID-19 infection. This was a three-

item scale and the statements were: 'It is very likely for me to get infected with COVID-19'; 'It is very likely for someone to get infected with COVID-19'; and 'I feel that I have higher chances to get sick from COVID-19 compared to other people'. These statements were adapted from the measurements previously used to assess perceived susceptibility to disease and had Cronbach alpha reliability.77 as reported by the authors. Responses are recorded on a seven-point Likert-type on one of the following options: "1 = *strongly disagree*, 2 = *disagree*, 3 = *somewhat disagree*, 4 = *neutral*, 5 = *somewhat agree*, 6 = *agree*, 7 = *strongly agree*". This scale measures participants' perceived risk for themselves first, and then the risk they perceive for another person (First index), and then again, their perceived risk for themselves (Second index). The scores on items 1 and 3 were reverse coded so high scores are indicative of low optimism bias with regards to COVID-19 and vice versa (for detailed scoring, see [Fife-Schaw & Barnett, 2004](#)).

Fear of COVID-19 Scale (FSV-19S). For measuring fear of COVID-19, FSV-19S developed by [Ahorsu et al. \(2020\)](#) was used. This scale has seven items. Participants rate their responses on a 5-item Likert-type scale and the response categories included "1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree* and 5 = *strongly agree*". Sample items are: "I am most afraid of Corona. It makes me uncomfortable to think about Corona". The total score is obtained by adding up all the scores on each item. Low scores represent low levels of fear, and high scores are indicative of high levels of fear. This scale has been found to have a Cronbach alpha reliability of .88 and was validated on the Iranian sample ([Ahorsu et al., 2020](#)).

Preventive COVID-19 Infection Behavior Scale (PCIBS). PCIBS was developed by [Chang et al. \(2020\)](#) according to preventive guidelines recommended by the World Health Organization to avoid the infection of COVID-19. PCIBS consists of five items; responses are recorded on a 5-point Likert-type scale with response categories ranging from 1 = *almost never* to 5 = *almost always*", suggesting how frequently an individual performs that behavior. Sample items are: "How often do you regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water? How often do you avoid touching eyes, nose, and mouth?" A high score indicates that the individual engages in that preventive behavior frequently. Authors have reported high alpha coefficients ($\alpha = .82$) of the scale ([Chang et al., 2020](#)).

Procedure

Participants were approached after seeking permission from the relevant authorities and institutions. High-risk individuals diagnosed with Type 1 Diabetes were approached on a one-to-one basis (after receiving approval from the Private clinic) while adhering to Standard Operating Procedures (SOPs) during the third wave of COVID-19. Furthermore, healthy young adults enrolled in a university's undergraduate program were shared the scale booklet using Google Forms, through email, and WhatsApp. To ensure the ethical aspect of the research, the participants were briefed upon the study's objectives, voluntary nature of their participation, anonymity and confidentiality and their right to withdraw any time. They were thanked for their cooperation in the end of data collection.

Results

The data were entered manually in the Statistical Package of Social Sciences - 23.0 version (SPSS-23). Descriptive analysis was performed to analyze the demographic characteristics of the sample groups and conduct the reliability analysis of the research measures. Pearson's Correlation Matrix was used to study the relationship between optimism bias, fear of COVID-19, and compliance with COVID-19-related protective behaviors. Furthermore, an independent sample *t-test* was carried out to compare the mean scores of the two sample groups: healthy and diabetic young adults.

Table 2

Descriptive Statistics and Psychometrics of Study Measures (N=100)

	Scales	<i>k</i>	<i>M</i>	<i>SD</i>	α	Range		Skewness	Kurtosis
						Actual	Potential		
1	OBM	3	15.60	4.1	.79	3-21	3-21	.65	-.80
2	FSV-19	7	20.22	5.28	.80	8-31	7-35	-.35	-.45
3	PCIB	5	17.99	5.2	.91	5-25	5-25	-.58	-.89

Note. OBM = Optimism Bias Measurement; FSV-19S = Fear of COVID-19 Scale; PCIBS = Preventive COVID-19 Infection Behavior Scale.

Table 2 shows the values of skewness and kurtosis which indicates that the data is normally distributed. Values of alpha coefficients show that all study measures have satisfactory to high internal consistency.

Table 3
Correlation Among Study Variables (N=100)

Variables	1	2	3
1. Fear of COVID-19	-	-.55**	.70**
2. Optimism bias	-	-	-.78**
3. Preventive behaviors for COVID-19	-	-	-

**
 $p < .01$.

Table 3 indicates a significant negative relationship between fear of COVID-19 and optimism bias related to COVID-19. Results also show that with an increase in the fear of COVID-19, compliance with COVID-19-related protective behaviors also increases. Moreover, results revealed significant negative relationship between optimism bias and compliance with COVID-19-related protective behaviors.

Table 4
Difference between Healthy and Diabetic Young Adults on Study Measures (N=100)

Variables	Healthy Young Adults (n = 50)		Diabetic Young Adults (n = 50)		t(df)	p	Cohen's d
	M	SD	M	SD			
Optimism Bias	14.02	2.59	10.10	2.10	8.29 (93)	.000	1.66
Fear	18.60	5.94	21.84	3.95	-3.20(85)	.002	0.64
PCIBS	15.54	5.45	20.44	3.57	-5.30(84)	.000	1.06

The results of the independent sample *t*-test in Table 4 show that optimism bias is significantly higher in healthy young adults than in young adults with Type 1 Diabetes. The results also indicate that healthy young adults are scoring significantly lower than young adults with Type 1 diabetes on fear of COVID-19 as well as on compliance with COVID-19 related protective behaviors.

Discussion

While preventive measures against COVID-19 are arguably the most powerful tools to curb the pandemic, their effectiveness depends on how much people comply with them. Multiple theories suggest that cognitive and emotional responses determine the behavioral changes produced in response to a health threat. Hence, the primary objective of this study was to analyze the relationship between optimism bias,

fear, and compliance with COVID-19 related protective behaviors and examine differences between these variables among healthy and high-risk diabetic young adults.

Our study hypothesized a negative relationship between optimism bias with respect to COVID-19 and compliance with COVID-19 related protective behaviors (Hypothesis No. 1). The present findings (Table 3) supported this hypothesis which is consistent with the previous research. Recent empirical work conducted in U.K., Italy, Romania, USA, Netherlands, and Pakistan also found a significant negative relationship between optimism bias related to COVID-19 and compliance with COVID-19 related protective behaviors (Asif et al., 2020; AsimaKopoulou et al., 2020; Druică et al., 2020; Dryhurst et al., 2020; Fragkaki et al., 2021; Park et al., 2020b; Wise et al., 2020). Arguably, the best way to describe this negative relationship is by quoting the health belief model (Hochbaum et al., 2016, as cited in Alsulaiman & Renter, 2018), which explains factors that determine behavioral changes in response to health threats. The greater the subjective evaluation of people about perceived susceptibility, the more likely they will modify their behavior to reduce said risk. On the other hand, optimism bias is one's perception of being less susceptible to getting infected or experiencing negative events. Such a tendency to perceive one as less susceptible to negative events might result in less compliance with preventive guidelines, especially in high-risk situations such as a pandemic.

Hypothesis 2 stated that fear of COVID-19 is positively related to compliance with COVID-19-related protective behaviors. Present findings provided support for this hypothesis (Table 3). These findings are in line with the previous studies (Khan et al., 2021; Knowles & Olatunji, 2020; Mahmood et al., 2020). Fear of being infected in an individual might motivate that individual to take preventive actions needed to protect oneself and one's society from the virus. Moreover, it is essential to mention that fear is viewed as an adaptive response, whereas anxiety is considered a maladaptive response (Kelvens, 1997). The health domain continues to use fear appeals to increase people's awareness of their vulnerability and persuade them to control their behavior accordingly. Therefore, it is safe to conclude that fear has a functional role and is associated with the increased adoption of safety measures during COVID-19 (Harper et al., 2021).

Hypothesis 3 stated that there is a negative correlation between fear of COVID-19 and optimism bias related to COVID-19. Present findings also provided support for this hypothesis and are in line with a study by Lench and Levine (2005) that found a negative relationship between fear and optimism bias in a sample of undergraduate students

and concluded that the presence of fear could decrease optimism bias to a certain extent.

As far as differences between healthy young adults and the individuals with Type 1 diabetes are concerned, it was hypothesized that healthy young adults have a significantly higher optimism bias as compared to young adults with Type 1 Diabetes (Hypothesis 4) and fear of COVID-19 and compliance with COVID-19-related protective behaviors are significantly lower in healthy young adults than in young individuals with Type 1 Diabetes (Hypothesis 5). Findings of the present study as shown in [Table 4](#) provided support for both of these hypotheses. A recent study by [Yan et al. \(2020\)](#) showed that adults with Diabetes perceived themselves at greater risk and were more worried about COVID-19 than non-diabetic individuals. This could be because of the absence of other physical illnesses; healthy young adults may consider this pandemic a threat overall but not a specific threat to them. This thought may also be fueled by the general emphasis on the strength of the immune systems of young adults rather than the disclaimer that young adults may be prone to a 'long' COVID-19 ([Yan, 2021](#)), nonetheless.

Furthermore, it was found that fear of COVID-19 was significantly lower in healthy young adults than in young adults with Type 1 Diabetes. This finding is compatible with previous research that reported significantly higher levels of fear in individuals with pre-existing medical conditions ([Alonzi et al., 2020](#)). The results indicated significantly lower fear in healthy young adults. A possible reason for this phenomenon could be the low COVID-19 infection-related mortality in healthy young adults. There is also a general emphasis on age ([Schnell et al., 2021](#)) and pre-existing medical conditions. The results of one meta-analysis reported that COVID-19 related mortality was much lower for children and young adults ([Levin et al., 2020](#)) than for older individuals. Even now, despite the severity of the current wave of COVID-19, the government is prioritizing older individuals for vaccination as they are considered a high-risk group. Considering the media's emphasis on a high-risk population, it is reasonable to say that a framing effect might be at play in influencing healthy young adults and their emotions in response to COVID-19.

Previous literature, also suggested that young adults exhibit less adherence with COVID-19 related protective behaviors ([Park et al., 2020a](#); [Wilson et al., 2020](#)), and individuals with Diabetes exhibit more compliance with preventive measures related to COVID-19 ([Pal et al., 2020](#)). This finding can also be supported by the fact that young adults with Type 1 Diabetes (T1D) regulate their disease through self-care behaviors such as diet, insulin, and exercise to avoid

complications (Fournier et al., 2003). Given that this young adult group has generally been controlling their Diabetes for quite some time already; active compliance with safety protocols for COVID-19 must have been a direct consequence, especially in the light of CDC's declaration.

Interestingly, the mean score of diabetic young adults on the fear of COVID-19 scale was ($M = 21.84$), whereas the maximum score on fear of COVID-19 is 35. This mean score does not indicate very high fear per se; instead, it suggests that young adults with Diabetes have moderate levels of fear and that they comply more with COVID-19-related protective behaviors as compared to healthy young adults who had an overall low mean score of ($M = 18.60$) on the Fear of COVID-19 scale. Hence, this study also sheds light on the importance of moderate levels of fear as an adaptive response necessary to increase compliance among the young population during the current pandemic.

Conclusion

This research study examined the role of optimism bias, fear, and compliance with COVID-19-related protective behaviors among healthy and diabetic young adults. Considerable support was found for all of the study's hypotheses. The presented study highlights the importance of cognitive and emotional factors in determining one's compliance with health-related behavior change, especially during pandemics.

Limitations and Suggestions

Although, this study found considerable support for all of its hypotheses, some limitations were faced while conducting this research. Due to the third wave of COVID-19, most of the data was collected online. The sample size was small, and the research primarily focused on the experiences of young adults of a specific socio-economic class and age group, which also limits the generalizability of the present study. Moreover, it was beyond the scope of this research to address other factors such as motivation, personality, thinking styles, morality, perceived barriers, and self-efficacy that may also play significant roles in health-related behavior change.

The present research design can be replicated to assess the role of optimism bias and fear in relation to compliance with COVID-19-related protective behaviors among a larger and more diverse sample, including older adults, participants from more than one socio-economic class, and individuals with other chronic health conditions

such as cardiovascular, liver, and kidney diseases. Lastly, other variables such as self-efficacy, locus of control, empathy, trust in government, personality, motivation, and thinking styles can be incorporated into the research design for a more holistic understanding of factors that could ensure voluntary compliance with preventive measures during a pandemic.

Implications

The current study's findings have important implications for future research and policymakers in the context of Pakistan. Firstly, it provides a deeper understanding of the factors that can influence compliance with the preventive protocols enforced against the pandemic. Secondly, it adds to the existing knowledge base and provides insight into the role of optimism bias and fear in influencing the individual's response to preventive guidelines during a pandemic.

Thirdly, the results of this study can help policymakers and practitioners in implementing more effective policies and designing campaigns especially tailored to encourage the adoption of preventive measures by considering the subjective perception of the pandemic among the young population of Pakistan. This study can also help them understand the short- and long-term impact of framing of issues around the current pandemic and help them make more informative guidelines in journalism and media practice.

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