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Self-perception and belief regarding COVID-19: An interventional study

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ABSTRACT

Background: In the era of active COVID 19, most studies that were being done were able to assess the firm beliefs and practices among the population. Belonging to a developing country, it was noted that the masses lacked education and awareness and the impact of this negligence was fatal among many.

Objective: The study aims to evaluate the knowledge, awareness, and perception of COVID-19 and see the effect of an awareness intervention on them.

Method: Randomized interventional study was designed which include individuals aged between 18 and 65 years. Illiterate people and those with neuropsychiatric disorders were excluded. Participants who were previously infected with COVID-19 were also excluded. A total of 897 participants were invited throughout Pakistan to fill out an online survey but only 606 participants met the inclusion criteria. Knowledge, attitudes, and practice about COVID-19 were assessed via a questionnaire and reassessed after educating them. SPSSv21 was used to evaluate the data while different demographic variables were compared by *t*-test/ANOVA.

Result: Out of 606 participants, 44.4% (269) were male and 53.5% (324) were female. Most of the participants were aged between 20 and 29, Furthermore, 93.4% (566) of participants were from urban settings. The majority of which are from Sindh. Most of the participants were bachelors. Many participants were employees but they prefer not to disclose their monthly income. Participants predominately belong to the religion of Islam. Post-intervention the attitude score changed significantly from pre-intervention to post-intervention (p-value <0.001).

Conclusion: Our study concluded that Pakistani resident's majority of which were female are somewhat affected but practice appropriate and optimistic approaches during the lockdown. The intervention has further cleared any doubts and confusion among them. The intervention was most successful for ages 20–29 years old and least for the elder age group. Those who were single took more advantage compared to the married ones.

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Introduction

According to the latest WHO statement on the global burden of COVID-19; there have been 192,284,207 confirmed cases, including 4,136,518 deaths with a total of 3,568,861,733 vaccine doses have been administered. Similarly, in Pakistan alone there have been 998,609 confirmed cases with 22,928 deaths with a total of 23,125,182 vaccine doses have been administered [1].

There had been a dramatic loss of human life worldwide and it presents challenges to public health, food systems, and the world of work. The drastic effects on the socio-economical condition of the people occur mostly due to unemployment and an increase in poverty.

As Pakistan was going through the deadly third wave of the COVID-19 pandemic during the study period, assessing the self-perception and belief of the Pakistani population regarding necessary safety measures and their response towards them helped in better understanding the psychology of the people. This way we were able to better understand the methods to counsel them on the national safety of the general population while restricting the spread

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of the disease [2]. Around the world, many educational programs and such activities for mental well-being via different communication platforms for general populations and health professionals have been conducted [3] but these kinds of activities have been largely lacking in Pakistan and have been severely neglected due to mental health being a taboo in Pakistan. In contrast to this, the Chinese Association for Mental Health has published 11 books related to mental well-being and self-safety against COVID-19 by February 8, 2020 [4]. Most of the Pakistani population remained in denial until they were affected by a close one's death or morbidity. Even after it, acceptance in low socio-economic groups was highly absent which added to the disease burden. People on daily wages and in poverty could not survive the lockdown and the help from the government could not suffice their needs.

It took at least a couple of weeks if not months to conduct household surveys based on the compact segment or grid-based geographical information system [5]. Since the 1980s, phone-based surveys have been widely conducted but due to the change in the trend of communication and technology; taking the example of the Gallup Poll Social Series which in the year 2017 was not successful receiving only 7% responses through phones [6]. Keeping these limitations in mind and the objective that we wanted to reach the maximum amount of people in a minimum amount of time and also be able to introduce our intervention and effectively change their self-perception, attitudes, and hopefully their beliefs for that purpose rapid online surveys are reasonably easy to conduct and get completed fast compared to other conventional methods. This method also demands minimal human resources, can reach a vast majority of respondents and allows for continuous monitoring through Google Docs, and helps in anonymizing the participants [7]. Thus, considering its benefits it can be considered a powerful tool to survey. This was a discrepancy found as compared to other studies conducted in Pakistan where a higher concentration of literacy is Punjab this might be due to the fact that the majority (85.6%) of the responses were from Sindh, another discrepancy was that the majority (60.89%) had at least bachelor level of education when we look at the literacy trends in Pakistan based on each province [8].

In any case, in a time of quick communication innovations, misinterpretations regarding the disease get increased and spread at a pace speedier than the genuine truths through social media. Practically 90% public requested ordinary data updates with respect to methods of sickness transmission, planning on new meds for the infection, prudent steps to be maintained in concentration while voyaging, ways different nations are taking care of the pandemic, regions more influenced by the infection, and related subtleties [9].

This rapid survey was designed to observe and determine knowledge, attitude, and perceptions of COVID-19 among the educated general public in Pakistan and then regardless of any discrepancies intervene and educate them regarding the virus itself and all its associating factors and in the process try to improve their mental health as well. The main purpose of the study was to understand the baseline perception and beliefs of educated people and how awareness videos and workshops would help.

Methodology

We conducted an interventional study through an awareness video assessing the knowledge, beliefs, and perceptions of people regarding COVID-19. The study design of our research is interventional. The participant was selected from throughout Pakistan, especially Pakistan. The study was for 6 months. The general population from age between more than 18 years and less than 65 years is selected for study. The sample size is 600 participants. Ethical consideration was taken from the Institutes of Research Board. All participants were well informed prior to intervention that all the data which are collected will only be used for study and will be kept anonymous. Names and personal information of participants will not be compromised or reproduced by any means. Protocol # 00034/20. The inclusion criteria based on which participants were included in the study is.

- People above 18 years and less than 65 years.
- People who can read and understand the English language.
- People who have some prior knowledge of COVID-19.
- People who are permanent residents of Pakistan.

The exclusion criteria based on which the participant was excluded from the research are.

- People who have neurological and psychiatric disorders.
- People who cannot read and understand the English language.

- People who do not have any prior knowledge of COVID-19.
- People who are infected with corona.

The sampling technique is convenient.

The process of data collection is based on the number of different pre- and post-intervention questionnaires, most of which were closed-ended questions while some of them were open-ended questions that ask general information from participants like for example how many hours they work and study from home. Then the questions were transferred to online Google forms and were distributed through convenience sampling techniques online through WhatsApp, E-mail, Facebook, etc. Individuals were invited to fill out the questionnaire throughout Pakistan. The survey form had a detailed description regarding the intent of the study, the anonymization of data, data protection as well as ethical approval and consent form. It also explicitly explained that the participation was completely voluntary and had no financial benefits attached to it. The participants had the option of leaving at any time without submitting the form. The participants were required to disclose that they could read and understand the English language those who cannot be eliminated from the study. Also, the subsequent inquiry posed to the people whether they knew about COVID-19 or 2019-nCoV or COVID illness in 2019. The individuals who addressed "no" to this inquiry were additionally rejected from the study. The procedure for data collection was that first through a pre-intervention questionnaire we assess the knowledge of the general population followed by intervention in intervention each participant was given complete and authenticated information about COVID-19 followed by a post-intervention questionnaire. The tools, which we will use in intervention to teach the participants consist of a video (video link: https://youtu.be/aIOmC8K21tk).

Statistical analysis

The results were exported from Google Forms and saved in CSV format. MS Excel 2013 and SPSSv21 were used to evaluate data. We compared the mean difference among various demographic variables by *t*-test/ANOVA. We computed results of pre and post-intervention and applied paired *t*-test where a *p*-value of (0.05) is considered statistically significant. In descriptive for categorical we used frequency and percentage and for numerical values we used mean and SD. *T*-test and *p*-value test were used for attitude scores after the intervention. SDs were calculated for pre and post-intervention. SD, *F* statistics, and *p*-value test were done to compare the mean of attitude of score difference among demographics (age, gender, province living, educational status, employment status, monthly income, marital status) variables using one-way ANOVA.

SDs, *T* statistics, and *p*-value test were done for comparing the mean of attitude score difference among dichotomous demographic variables (religion and residential setting-urban and rural).

Results

Demographic details of the participants

Out of 897 participants who were approached, a total of 606 complete responses were received making a response rate of 67.5%. Table 1 shows the demographic characteristics, i.e., age, gender, area of residence, education, occupation, and total household income of the respondents who filled out the online survey: out of those 606 participants, 44.4% (269) of the sample population were males, and 53.5% (324) were females, with their ages ranging from 20 years to more than 50 years. The majority (70.1%) of the responses received were from participants who aged between 20 and 29 years. 64.2% of participants were single,

Table 1. Showing basic demographic characteristics of study participants (*n* = 606).

Variable	Frequency (*n*)	Percentage (%)
Age		
20–29	425	70.1
31–40	108	17.8
41–50	36	5.9
>50	37	6.1
Gender		
Female	324	53.5
Male	269	44.4
Prefer not to disclose	13	2.1
Province living		
Sindh	519	85.6
Punjab	51	8.4
Baluchistan	5	0.8
Khyber Pakhtunkhwa (KPK)	4	0.7
Azad Jammu Kashmir (AJK)	3	0.5
Gilgit Baltistan	1	0.2
Islamabad	23	3.8

Variable	Frequency (*n*)	Percentage (%)
Residential setting		
Urban	566	93.4
Rural	40	6.6
Educational status		
Un-educated	10	1.7
Primary school (Grades 1 to 5)	12	2.0
Secondary school (Grades 6 to 10)	18	3.0
Higher secondary school (Grades 11 to 12)	104	17.2
Bachelors	369	60.9
Masters	76	12.5
Doctorate (PhD)	17	2.8
Employment status		
Unemployed	268	44.2
Employed	281	46.4
Student	57	9.4
Employment sector		
Unemployed	268	44.2
Public	58	9.6
Private	150	24.8
Self-employed	73	12.0
Student	57	9.4
Monthly income		
10,000-15,000 PKR	74	12.2
<10,000 PKR	138	22.8
15,000–30,000 PKR	68	11.2
30,000–50,000 PKR	62	10.2
>50,000 PKR	75	12.4
Prefer not to tell	189	31.2
Religion		
Christianity	18	3.0
Islam	573	94.6
Hinduism	12	2.0
Atheism	3	.5
Marital status		
Married	199	32.8
Single	389	64.2
Separated/Divorced	18	3.0

32.8% were married, and 3.0% were divorced individuals.

With about 93.4% participants from the Urban setting, a major part of the population belonged to the Sindh province, making up to 85.6% of the total participants, followed by participants from Punjab (8.4%), Islamabad (3.8%) and others (2.2%) including participants from Balochistan, Gilgit-Baltistan, AJK, and KPK. Participants from different levels of education were reached with a majority (60.9%) population of Bachelor, followed by high school degree holders (17.2%) and a minimum number of people were below the primary level (1.7%); occupation: mostly, employed (46.4%) and unemployed (44.2%). Majority of people (31.2%) who participated in the study preferred not to disclose their monthly income, out of those who did, the majority (22.8%) earned less than 10,000 PKR a month. However, 46.4% of participants were employed with the majority (24.8%) working in the private sectors, 44.2% were unemployed and 9.4% were students. Participants predominantly belonged to the religion of Islam (94.6%) followed by Christians (3.0%), Hindus (2.0%), and Atheists (0.5%).

Post-intervention change in attitude

In order to educate the masses, we introduced an intervention with the hopes of improving the knowledge, attitude, and perception of the population regarding the COVID-19 pandemic and everything preceding and following it. For that purpose, we developed a video and through it introduced our intervention. The attitude score before our intervention among the respondents who filled out the pre-intervention form was 26.02 (4.150 SD) and immediately following the intervention it improved to 35.45 (7.991 SD) (Table 2). The (p-value < 0.001) is highly significant which denotes that our intervention was successful and achieved at least a commendable result.

Our primary objective was to assess any change in perception score after intervention and our hypothesis is that the mean score difference (post minus pre) is different from zero Ho: μ (score change) = 0 H1: μ (score change) ≠ 0 By using paired t-test we

Table 2. Change of attitude score related to COVID-19 after intervention among 606 respondents.

Variable	Pre-intervention mean (SD)	Post-intervention mean (SD)	Mean of score difference (95%CI)	*t*-statistics (df)	*p*-value[a]
Attitude score	26.02(4.150)	35.45(7.991)	9.43(8.712, 10.149)	25.778(605)	<0.001

observed that perception score has been changed significantly from pre-intervention to post-intervention. Paired *t*-test is significant (*p*-value <0.001) Mean of the (post-Pre) score is significantly more than zero. The attitude score has changed significantly from pre-intervention to post-intervention (*p*-value <0.001). We observed that the post-intervention score is significantly higher than the pre-intervention score.

With respect to age group, our intervention was most successful among individuals between 20 and 29 years of age, which shows decrease compliance among older individuals. Another significant point of interest was the higher level of compliance among married individuals (*p*-value <0.013) as compared to those who were single, which shows a higher risk-taking attitude among those who are single as compared to those who are married in Pakistan likely due to religious and cultural trends (Tables 3 and 4).

We compared this mean pre- and post-difference in perception scoreS among various demographic characteristics to assess any significant association. When we compare the mean score difference between gender, Ho: $\mu 1 = \mu 2$ H1: $\mu 1 \neq \mu 2$. We found that the two groups are not significantly different ($p = 0.083$) therefore there is no significant association between gender and change in pre-and post-intervention perception scores.

When we compare the mean score difference among four age groups Ho: $\mu 1 = \mu 2 = \mu 3 = \mu 4$

H1: $\mu 1 \neq \mu 2 \neq \mu 3 \neq \mu 4$ we found that was significant ($p < 0.001$) subsequent *post-hoc* test (Turkey procedure) suggested that age, marital status, and level of education are statistically significant. Therefore, the mean pre- and post-difference in perception score is significantly different among ages 20–29 as compared to those who were in their 40s and 50s, and similarly, those who were married as compared to those who were not. We observed that those with age 20–29 showed greater change in perception score as compared to others.

Discussion

An analysis of the self-perception, attitude, and knowledge of COVID-19 was carried out through our survey among the convenience-sampled general population of Pakistan. It took us approximately 1 month to obtain 600 responses to knowledge, attitude, activities, perception, and behavior-based pre- and post-intervention proforma containing (No = *n*) questions. According to our results, most of the participants came to know about the disease COVID-19 through social media and news channels in Pakistan. Albeit these stages are a characteristic source of admittance to the data and information throughout the planet, it is as yet not the most dependable alternative to browse. Counterfeit news is frequently connected with so many stages as Facebook. For instance, there had

Table 3. Comparing the mean of attitude score difference among demographic variables using one-way ANOVA.

Characteristics	*N*	Mean difference (SD)	*F* statistics (*df*)	*p*-value[a]
Age				
20–29	425	10.38 (8.694)	10.51 (3,602)	<0.001*
31–40	108	7.40 (9.050)		
41–50	36	2.89 (8.801)		
>50	37	10.83 (9.281)		
Gender				
Female	324	9.76 (8.825)	2.49 (2,603)	0.083
Male	269	9.28 (9.064)		
Prefer not to disclose	13	4.15 (11.126)		
Province living				
Sindh	519	9.70 (9.013)	2.29 (2,603)	0.102
Punjab	51	8.68 (8.693)		
Others	36	6.52 (8.993)		
Educational status				
Un-educated	10	−5.80 (11.262)	10.62 (451,120)	<0.001*b
School	30	1.76 (12.065)		
College	104	7.91 (9.717)		
Graduate	369	10.34 (8.16)		
Postgraduate	93	11.61 (6.903)		
Employment status				
Unemployed	268	8.69 (9.444)	1.649 (2,603)	0.193
Employed	281	10.06 (8.691)		
Student	57	9.78 (8.275)		

Characteristics	*N*	Mean difference (SD)	*F* statistics (*df*)	*p*-value[a]
Monthly income				
10,000–15,000 PKR	138	8.4710 (9.253)	0.940 (5,600)	0.454
<10,000 PKR	74	11.1216 (10.207)		
15,000–30,000 PKR	68	9.8382 (9.694)		
30,000–50,000 PKR	62	9.5484 (9.146)		
>50,000 PKR	75	9.8400 (7.154)		
Prefer not to tell	189	9.1217 (8.679)		
Marital status				
Married	199	9.39 (8.809)	4.391 (2,603)	0.013*
Single	389	9.73 (9.025)		
Separated/Divorced	18	3.33 (9.035)*		

*Significant *p*-value; *p*-value ≤0.05 is considered significant.
[a]One-way ANOVA.
[b]Welch ANOVA if homogeneity of variance is not assumed.

Table 4. *Post hoc* multiple comparison showing only significantly different groups.

Group	Compared with group	*p*-value
Age		
20–29	31–40	0.009[a]
	41–50	0.000[a]
31–40	41–50	0.040[a]
41–50	>50	0.001[a]
Marital status		
Separated/divorced	Married	0.017[a]
	single	0.009[a]
Education		
Uneducated	College	0.025[b]
	Graduate	0.009[b]
	Postgraduate	0.005[b]
School	Graduate	0.005[b]
	Postgraduate	0.001[b]
College	Postgraduate	0.019[b]

[a]Tukey procedure.
[b]Games Howell.

been a lot of falsehood about the hydroxychloroquine to be utilized as an expected treatment for the COVID-19, which caused a lack of that medication for the individuals who really required them [10]. The demographics of the participants, like age, sex, and ethnicity, indicated that most active participation was seen from female adults (between 20 and 29) from the province of Sindh. The distribution of participants among household income showed the people came from mediocre but well-educated families. This was a discrepancy found as compared to other studies conducted in Pakistan where a higher concentration of literacy is in Punjab as most responses were from Sindh [8]. Since the majority of the respondents had at least a bachelor's this means that they carefully evaluated and answered the questions based on pertinent information. Similarities were observed in another study like this in China [11].

Regarding the survey findings, the participants are observing social distancing and hand washing quite frequently. The general public appeared to have a compliant attitude toward the precautions to be taken for COVID-19 [12]. The participants all over the region believe that typical surgical masks are most effective in protecting them from the COVID infection, and they overestimated the protective ability of a cloth mask over an N95 mask. The same problem was encountered in Egypt where it was reported that people knew that mask does protect them from coronavirus but they didn't know which type of mask [13]. Thermal scanners are likewise being utilized at the supermarkets and banks, which are open in Pakistan during the pandemic, and not very many individuals reacted that it very well may be a successful means of examining for COVID-19–positive patients. Likely because of this insight, it would seem that even informed individuals do not place their confidence in the adequacy of thermal scanners. Nonetheless, it has been accounted for in the medical literature that warm scanners have been utilized as a compelling procedure at hospitals [14] and airports [15] and have been proven effective for screening for COVID-19.

The results interestingly show that the perception of people equally supports both notions, i.e., COVID-19 being a natural pandemic or a possible bioweapon or a divine punishment. Our study has given similar results to another study, which showed a correlation between global infections artificially created by world powers to damage the global economy [16].

In our collected responses, the majority of participants thought that everyone is susceptible to the novel coronavirus disease, while nearly the same number of participants responded that older people are more likely to get it. A Chinese study also

provided similar information [17]. The COVID-19 infection may be symptomatic or asymptomatic in many people; however, according to the result of our survey, the participants have recognized fever, cough, and shortness of breath as three primary symptoms of the infected person. The knowledge of our participants is in line with those presented by other epidemiological studies [17,18].

The most crucial thing in a contagious disease is to be cautious of its mode of transmission and valid measures for its prevention. The participants in our survey have largely responded that social gatherings and intimacy such as handshakes are the leading cause of the spread of the SARS-CoV-2 infection, and the key to preventing and containing it is also in practicing social distancing and frequent hand washing. These responses show that the knowledge of the participants is up-to-date and in accordance with the guidelines of WHO [19,20]. In order to better understand the knowledge, perception, and attitude of the Pakistani population towards the COVID-19 pandemic response of a similar population like India should also be taken into account [21]. Furthermore, another example of limiting the spread of the COVID-19 virus would be the Chinese population. They limited the spread by shutting down entire cities, limiting traffic to only ambulances throughout their country. They were confident in their preventive measures and were able to effectively lower the mortality rate [17].

The extent of asymptomatic patients in the event of COVID-19 is high and a significant component of this sickness. It is assessed that roughly 60% of all contaminations with gentle indications or asymptotic cases may pass the infection to other people [22]. With the expanding number of COVID-19 cases all around the world, various nations including Pakistan have embraced careful steps, i.e., social removal, successive hand washing, and wearing masks to forestall the spread of the virus. Wearing a facemask is a viable actual intercession against illness transmission [23]. The utilization of facemasks has gotten broad in developed and underdeveloped nations including Asia. A large portion of individuals are utilizing surgical masks to diminish the danger of getting COVID-19 contamination [24]. The public impression of well-being hazard assumes a fundamental part in the appropriation of government measures to forestall the spread of COVID-19, and these actions and activities had a direct impact on the ways of life and demeanor of individuals [25].

Limitations

The biggest limitation of our study was that it was conducted during the 3rd wave of the pandemic March 2021 when a vast majority was already aware of the virus and its accompanying data. The investigation was restricted to just those people who had the option to peruse and compose the English language. Another limit of this examination was that the majority of the reactions we got were from instructed part of society who approaches the web, and the remainder of the general population was subsequently barred. Unfortunately, the examination might not have precisely addressed every one of the extents of our Pakistani society; nonetheless, it might mirror an overall outline of the practices present in the general public.

As a result of the restricted portrayal of the members, more examinations like this are recommended to explore different regions identified with COVID-19 in Pakistan, for example, the monetary weight and accessibility of the SARS-CoV-2 vaccines in the inhabitants of low financial status. Our examination was restricted to individuals who comprehend the English language.

The biggest flaw in our intervention was that we introduce a general intervention for each of the participants due to our limitation when we should have actually developed subject-specific interventions based on the responses of each respondent which would have helped in better educating the masses.

Notwithstanding, some new examinations have shown comparable outcomes as those of our investigation. In one examination, it was shown that there is an undeniable level of information in regard to the infection among the members. Yet, a few myths are likewise pervasive among people in general [26,27].

Conclusion

Our study and the subsequent intervention have thus concluded that Pakistani residents of moderate socioeconomic status, particularly female students with bachelor degrees, mostly are single and are somewhat affected by the lockdown, have appropriate practices and optimistic approaches during the pandemic in terms of the of response to COVID infection and the intervention has further improved and cleared any confusion or prevailing doubts among them. The intervention being most successful for ages 20–29 years old and least for the elder age group. Those who were single took more advantage compared to the married ones.

Ethics statement

This study was approved by the Institutional Review Board (IRB) Jinnah Medical and Dental College (JMDC) Protocol Number #: 00034/20.

Author contribution

All authors contributed equally to the manuscript.

Conflict of interest

The authors have no conflict of interest to declare.

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