ORIGINAL ARTICLE

KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING COVID-19 AMONG THE GENERAL POPULATION OF PESHAWAR DISTRICT; AN ANALYTICAL CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction: Knowledge, Attitude and Practices (KAP) regarding COVID-19 play a very vital role in assessing whether the population have accepted the behavioral changes to COVID-19 or still, the population is unaware or has a negative attitude towards preventive measures to COVID-19.

Material & Methods: A KAP study was carried out in Peshawar, Pakistan. Residents of the Peshawar district, both genders, aged 18 years and older, were included in the study. An online questionnaire consisting of questions related to demographic information, knowledge, attitude and practice of COVID-19 was shared with the participants. Informed consent was taken from all participants. Chi-square and correlational tests were used to check the associations and correlations between different variables.

Results: A total of 262 participants took part in the study. The mean age of the participants was 27.66 ± 8.706 years. Most of the participants were males (76.3%), graduated (49.5%), students (51.5%), single (66%), and were living in the urban area (54.6%). The mean knowledge score was 9.14 ± 2.44 out of a total of 12. There was a significant association (P-value <0.05) between knowledge and the field of education. 88.8% of participants believed that the situation of COVID-19 would be controlled and 86.6% agreed that Pakistan will win the battle against COVID-19. 81.7% were visiting crowded places, 52.7% were wearing masks and 91.6% were washing their hands with soap.

Conclusion: The population demonstrated a generally strong level of knowledge. Most of the participants had a positive attitude towards COVID-19. There was malpractice of different preventive measures except washing hands with soaps. Attitude towards COVID-19 was significantly associated with occupation and field of education.

Keywords: Attitude, COVID-19, Knowledge, Prevention.

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INTRODUCTION

Since the start COVID-19 Pandemic, there have been over 776 million confirmed cases

worldwide, with more than seven million deaths reported.[1] A serious health problem or pandemic requires an understanding, acceptance of its mechanism and its facts by the general population like the new virus, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov-2) which is a single-strand enveloped RNA virus and its consequent disease Corona Virus Disease 2019 (COVID-19).[2,3] The Coronavirus Study Group (CSG) identifies this virus as forming a sister clade to the original human and bat severe acute respiratory syndrome coronaviruses (SARS-CoVs) within the species Severe acute respiratory syndrome-related coronavirus and has designated it SARS-CoV-2.[4] SARS-CoV-2 is the third most highly pathogenic coronavirus to infect humans and spread rapidly, following the SARS-CoVs in 2002-2003 and the Middle East Respiratory Syndrome (MERS) virus in 2012.[5] SARS-Cov-2 was first identified in Hubei, China.[6] Japan and Thailand were the 1st two countries that reported cases of COVID-19 outside China.[6] World Health Organization (WHO) declared it a pandemic around the world on 11 March 2020.[7] The first case in Pakistan was reported on 26th February 2020.[8] As of 12th September 2020, the total number of confirmed cases of COVID-19 in Pakistan is 300,955 and the total number of deaths is 6373.[8] Total recovered patients from COVID-19 as of 12th September 2020 are 288, 536.[8] A total of 131,675 cases in Sindh, 36,362 in Khyber Pakhtunkhwa, 15,862 in Islamabad, 97,602 in Punjab, 13,401 in Baluchistan, 2389 in Azad Jammu Kashmir and 3164 cases are reported.[8]

Several studies from Pakistan are reported in the literature but most of them are conducted on Healthcare Professionals (HCPs).[9-14] A study from Pakistan reported that HCPs have good knowledge, positive attitudes and good practice.[9] Higher knowledge among the general population was reported in different studies from Asia.[15-18]

The Knowledge, Attitude and Practice (KAP) regarding COVID-19 play a vital role in assessing whether the population has accepted the behavioral changes to COVID-19 or still, the population is unaware or has a negative attitude towards preventive measures of COVID-19. The KAP regarding COVID-19 would play a vital role in providing better insight to address the general population's poor knowledge about the disease, developing effective preventive measures and promoting various health programs. The current study also provides an overall overview of the Pakistan's preventive strategies for COVID-19. Findings of the study will help the government to plan strategies that help the population to adopt pandemic and infectious disease control measures. Moreover, to facilitate effective pandemic management in Pakistan, KAP studies are vital to assess and understand the population's awareness and behavior in such scenarios. The objective of this study was to assess the knowledge, attitudes and practices of the Pakistani population regarding COVID-19.

MATERIAL AND METHODS

This analytical cross-sectional study was conducted from April 02 to July 30 in the Peshawar district of the Islamic Republic of Pakistan. During COVID-19 in Pakistan, it was not possible for the authors to collect data physically, so the data was collected online. A questionnaire was designed via Google form and a link of the form was generated. The link was shared with participants on WhatsApp, Twitter, Facebook walls and Facebook Messenger. The link was also shared on the wall of the researchers as well as in different Facebook groups. The questionnaire contained information regarding demographics, background information, study objective, confidentiality, Residents of Peshawar district, Nationality, Age (18 or above years). Consent was taken prior to the data collection. Participants who gave consent were invited to submit the online questionnaire. The data was collected physically from those participants who were illiterate or lacked internet facilities.

The questionnaire was divided into two parts: Demographic information and KAP special questions. Gender, Age, Occupation,

Education level, and Marital status were included in the demographic section. The COVID-19 KAP part of the questionnaire was divided into three sections i.e. Knowledge, Attitude and Practice. The knowledge section had 12 items (Fig. 1): 4 items were regarding the clinical presentations (KQ1-KQ4), 3 items were regarding the transmission routes (KQ5-KQ7), and the last 5 items were regarding the prevention and control (KQ8-KQ12) of COVID-19 (Fig. 1). True and false were the answers to these items along with an extra option of (I don't know). 01 score was considered for the right answer while a 0 score was given to the wrong answer or unknown (I don't know) answer. The total COVID-19 knowledge score ranged from 0 to 12, which was interpreted as the higher the score better the knowledge. The internal consistency between the items was checked through the SPSS reliability test, i.e. Cronbach alpha coefficient, which was 0.750, indicating acceptable internal consistency. [19] The Attitude section had 3 items (AQ1-AQ3) (Fig. 1). The items were regarding the conformity on the control of COVID-19, the self-assurance in conquering the fight against this pandemic, and greeting friends and colleagues with a handshake. To assess practice, three items (PQ1-PQ3) (Fig. 1) were in the questionnaire. The items were regarding visiting a crowded area, washing hands with soaps, and wearing a mask when leaving home in recent days.

Questions	Options
Knowledge	
KQ1. The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and body pain.	True, false, I don't know
KQ2. Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus.	True, false, I don't know
KQ3. There currently is no effective cure for COVID-2019, but early symptomatic and supportive treatment can help most patients recover from the infection.	True, false, I don't know
KQ4. Not all persons with COVID-2019 will develop to severe cases. Only those who are elderly, have chronic illnesses, and are obese are more likely to be severe cases.	True, false, I don't know
KQ5. Eating or contacting wild animals would result in the infection by the COVID-19 virus.	True, false, I don't know
KQ6. Persons with COVID-2019 cannot infect the virus to others when a fever is not present.	True, false, I don't know
KQ7. The COVID-19 virus spreads via respiratory droplets of infected individuals.	True, false, I don't know
KQ8. Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus.	True, false, I don't know
KQ9. It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus.	True, false, I don't know
KQ10. To prevent the infection by COVID-19, individuals should avoid going to crowded places such as train stations and avoid taking public transportations.	True, false, I don't know
KQ11. Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus.	True, false, I don't know
KQ12. People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the observation period is 14 days.	True, false, I don't know
Attitudes	
AQ1. Do you agree that COVID-19 will finally be successfully controlled?	Yes, No
AQ2. Do you have confidence that Pakistan can win the battle against the COVID-19 virus?	Yes, No
AQ3. Do you always greet your friends and relatives with handshake when you met them?	
Practices	
PQ1. In recent days, have you gone to any crowded place?	Yes, No
PQ2. In recent days, have you worn a mask when leaving home?	Yes, No
PQ3. Do you frequently wash your hands with soup?	Yes, No

Figure 1: Questions related to knowledge, attitudes and practices

The frequency and percentages for the knowledge, attitude and practices were analyzed and reported. The Chi-square Test and Pearson Correlation Test were used to check the association and correlation between knowledge total score and other demographic variables as well as an association of attitudes with different demographic levels. Multiple linear regression was used to quantify the findings of the association tests. Data was analyzed using SPSS version 25.0. The significance level was set at $P < 0.05$.

The study received ethical approval from the Institutional Research Committee (IRC) of the NCS University System in Peshawar. Informed consent was obtained from each participant, and the consent form was translated into Urdu to enhance comprehension among the general population.

RESULTS

The study had a total of 262 participants, recruited through both online and physical methods. Out of which 200 (76.3%) were male while 62 (23.7%) were females. The mean age of the participants was 27.66 ±8.706 years. The age of the participants ranged between 18 and 59 years. Most of the participants (n=227) were between 18 and 35 years old. Majority of the participants were graduates (n=130, 49.5%) followed by students (n=135, 51.5). 173 (66%) were single and 86 (32.8) were married while the remaining were either widowed or divorced. 143 (54.6%) were living in an urban area while 119 (45.4%) were living in a rural area. The mean knowledge score was 9.14 ±2.44 out of a total of 12. The mode and median total knowledge scores were 11 and 10, indicating that most of the participants had the highest knowledge regarding COVID-19.

Table 1: Demographic Characteristics of the Participants

Variable	Categories	Frequency	Percentage
Age	18-35	227	86.6
	36-50	23	8.8
	51+	12	4.6
Gender	Male	200	76.3
	Female	62	23.7
Education	Matriculation or less	10	3.8
	Intermediate	46	17.6
	Graduation	130	49.6
	Post Graduation	49	18.7
	Others	27	10.3
Marital Status	Married	86	32.8
	Single	173	66.0
	Others	3	1.1
Occupation/Profession	Student	135	51.5
	Govt. Servant	31	11.8
	Unemployed	24	9.2
	Businessman	18	6.9
	Employee at a Private organization	48	18.3
	Others	6	2.3
Residency	Urban	143	54.6
	Rural	119	45.4

Table 2: Frequency and percentages of correct answers to knowledge questions

Question regarding knowledge	Frequency of correct answer	% of the correct answer
KQ1	240	91.6
KQ2	159	56.9
KQ3	223	85.1
KQ4	99	37.8
KQ5	171	65.3
KQ6	232	88.5
KQ7	164	62.6

KQ8	226	86.3
KQ9	200	76.3
KQ10	227	86.6
KQ11	228	87.0
KQ12	235	89.7

The Chi-square test and Pearson correlation were used to check association and correlation. P < 0.05. was considered significant value. According to the chi-square test, there was a significant relationship (P-value = <0.05) between the field of education and marital status with total knowledge score. On the other hand, there was a statistically insignificant relationship (P-value = >0.05) of total knowledge score with gender and residency. The participants with an education level of intermediate or less and fields other than medical and health sciences were considered participants of non-health sciences for the chi-square test. The Pearson correlation test was applied to assess the relationship between total knowledge score and age which revealed that there was a statistically significant (P = <0.001) association between age and total knowledge score.

Table 3: Chi-square test among demographic variables and total knowledge score

		Poor Knowledge (%)	Good Knowledge (%)	Total	P value
Gender	Male	19 (9.5)	181 (90.5)	200	0.264
	Female	9 (14.5)	53 (85.5)	62	
Marital Status	Single	12 (6.9)	161(93.1)	173	0.016
	Married	15 (17.4)	71 (82.6)	86	
	Others	1 (33.3)	2 (66.7)	3	
Residency	Urban	15 (10.5)	128 (89.5)	143	0.910
	Rural	13 (10.9)	106 (89.1)	119	
Field of education	Health Sciences	4 (3.3)	118 (96.7)	122	<0.001
	Non-health sciences	24 (17.1)	116 (82.9)	140	

Pearson ‘s correlation revealed that there was a high correlation between knowledge and attitudes towards COVID-19 (Knowledge vs AQ1 P-value = <0.001, Knowledge vs AQ2 P-value = <0.001, Knowledge vs AQ3 P-value = 0.026).

Most of the participants (n=230, 87.3%) agreed that the COVID-19 situation would be controlled successfully while only 32 (12.2%) thought that this situation is out of control and overcoming this battle is difficult. Successful controlling of this situation was significantly associated (P = < 0.005) with the occupation of the participants while non-significant (P = > 0.005) with marital status, education, gender, and field of education. Similarly, when participants were asked about overcoming and winning this battle by the Pakistani government many of the participants (n=227, 87.8%) were having a positive approach and were thinking that Pakistani will win the fight against COVID-19. 61.15% (n=61) of participants agreed that they do handshakes when they meet their friends and relatives.

Table 4: Descriptive statistics of knowledge, attitudes and practice regarding COVID-19

	Options		Frequency	Percentage
Knowledge	Poor knowledge		28	10.7
	Good Knowledge		234	89.3
Attitudes	AQ1	Yes	230	87.8
		No	32	12.2
	AQ2	Yes	227	86.6
		No	35	13.4
	AQ3	Yes	160	61.1
		No	102	38.9
Practices	PQ1	Yes	214	81.7

	No	48	18.3
PQ2	Yes	138	52.7
	No	124	47.3
PQ3	Yes	240	91.6
	No	22	8.4

Most of the participants (n=214, 81.7%) were visiting crowded places while only 48 (18.3%) of the total 262 were avoiding crowded places. There was good practice of washing hands regularly with soap or sanitizer. 91.6% (n=240) were washing their hands regularly with soap. 52.7% (n=138) of the participants were wearing masks when leaving home.

Table 5: Chi-square test between attitudes and demographic variables

		AQ1			*AQ2*			*AQ3*		
		Yes	*No*	*P value*	*Yes*	*No*	*P value*	*Yes*	*No*	*P value*
Gender	*Male*	179	21	0.128	175	25	0.463	118	*82*	0.217
	Female	51	11		52	*10*		42	*20*	
Marital status	*Single*	71	15	0.171	71	*15*	0.335	54	*32*	0.580
	Married	15	17		153	*20*		105	*68*	
	Other	*3*	*0*		*3*	*0*		*1*	*2*	
Residency	*Urban*	*126*	*17*	0.860	126	17	0.443	85	*58*	0.554
	Rural	*104*	*15*		101	*18*		75	*44*	
Field of education	*Health sciences*	*110*	*112*	0.273	112	*10*	0.022	76	*46*	0.704
	Nonhealthy sciences	*120*	*20*		*115*	*25*		*84*	*56*	
Occupation	*Student*	123	*12*	*0.006*	*119*	*16*	*0.149*	*86*	*49*	*0.232*
	Govt employee	30	*1*		*28*	*3*		*19*	*12*	
	Unemployed	16	*8*		*17*	*7*		*10*	*14*	
	Businessman	17	*1*		*14*	*4*		*13*	*5*	
	Privat organization	39	*9*		*44*	*4*		*27*	*21*	
	other	*5*	*1*		*5*	*1*		*5*	*1*	
Education	*Matriculation or less*	9	*1*	0.665	*8*	*2*	0.101	*9*	*1*	0.152
	Intermediate	39	*7*		*35*	*11*		*27*	*9*	
	Graduation	113	*17*		*118*	*12*		*80*	*50*	
	Postgraduation	*113*	*17*		*118*	*12*		*80*	*95*	
	Other	*23*	*4*		*22*	*5*		*19*	*8*	

A chi-square test was applied to assess the association of demographic variables and different questions related to COVID-19. There was a significant association between occupation and the first question of attitude (AQ1 Successfully controlling this situation) while the field of education was statistically significant to the second question of attitude (AQ2 Winning this battle against COVID-19 by Pakistan). There was a non-significant association between all other demographic variables and different questions related to attitudes towards COVID-19.

Multiple linear regression was used to predict the total knowledge score regarding COVID-19 from gender, level of education, marital status, residency, field of education, and age. Among these variables, only marital status and field of education statistically significantly predicted total knowledge score, $F(4, 95) = 32.393$, $p < .0005$, $R2 = .577$. Multiple regression analysis revealed that marital status (OR: 0.145, CI: 0.113-1.331) (P-value 0.020) and field of education (OR: -0.174 CI: 1.443-0.263) (P-value 0.005) were independently and significantly associated with total knowledge score. The total knowledge was considered as a dependent variable while gender, level of education, marital status, residency type, and field of education were taken as independent variables.

Table 6: Linear regression analysis

Variable	B	S.E	P value	Standardized Coefficient Beta	95 C.I. for EXP (B)

					Lower	Upper
Gender	-.109	.357	.760	-.019	-.813	.594
Education	.075	.156	.633	.029	-.233	.382
Marital Status	.722	.309	.020	.145	.113	1.331
Residency	.173	.300	.564	.035	-.417	.763
Field of Education	-.853	.300	.005	-.174	-1.443	-.263
Age	-.093	.021	0.000	-.330	-.135	-.051
Constant	8.879	1.139	.000		6.635	11.123

DISCUSSION

In this KAP study, the authors found that most of the participants (89.9%) had a high knowledge score regarding COVID-19 which indicated that participants were aware of the pandemic. 76.6% was the average rate of the correct answers for 12 questions of knowledge regarding COVID-19. Several other similar KAP studies conducted in different countries of Asia also revealed high knowledge scores regarding COVID-19 among general populations,[15-18] medical students,[20] and healthcare workers.[21-25] A similar study was also conducted in Pakistan among healthcare professionals.[9] A study conducted in Libya reported that healthcare workers and the general population of Libya had enough knowledge regarding COVID-19.[26] Another study conducted in India revealed that healthcare professionals had good knowledge regarding COVID-19.[27]

In the current study, it was revealed that knowledge scores were significantly associated with marital status and field of education. Those participants who belonged to the health field reported higher knowledge. The reason may be because they have studied viral infections and their signs and symptoms as well as etiology and treatment. There was no significant association with gender, type of living i.e. rural living or urban living and age with knowledge total score. In the current study, the average knowledge score for 12 questions was 9.14±2.44. Similarly, a KAP study conducted in Malaysia reported almost similar findings that the mean knowledge score for 13 questions was 10.5 ±1.4 (15). The difference may be because of the difference in the total literacy rate of both countries as well as the questions in the questionnaires of both studies. Rural areas have relatively limited internet resources as well as less access to online health information but regardless of this fact, there were huge differences in the knowledge score between participants living in rural and urban areas.

Most of the participants (87.3%) in the current study had a positive attitude towards controlling COVID-19. Similar findings were also reported among the Malaysian and Chinese populations.[15,16] Overall, 9 out of 10 people think that the pandemic will be controlled as compared to the Malaysian population where overall 8 out of 10 people thought the same.[15] There were contradictions between the current study and the study conducted in China regarding the association of attitudes among different demographic variables. Similar questions were asked to assess the attitudes of both populations. In the current study, there was a statistically significant association of attitudes with the field of education and living area while gender, age, marital status, and level of education level were not significantly associated with the attitudes towards COVID-19. On the other hand, among the Chinese population, there was a significant association of attitudes regarding COVID-19 with gender, education level and different occupations.[16]

In the current study, most of the people were not taking any preventive measures, i.e. wearing masks when leaving home and avoiding visiting crowded areas while they

were taking other preventive measures, i.e. washing hands regularly with soap or sanitizer. 91.6 % of the participants were washing their hands with soap and 81. % of the participants were visiting crowded places. Similarly, another study also reported malpractice among Pakistani HCPs.[13] Few studies reported good practices among HCPs of Pakistan.[10] The reason behind visiting crowded places may be the partial lockdown in Pakistan. The reason for the practice of regularly washing hands may be the government campaign for preventive measures in newspapers and electronic media. Another reason for this good practice of washing hands with soap may the caller tune set by all the cellular companies in Pakistan regarding avoiding crowded places, wearing masks and washing hands regularly with soap in this pandemic situation visiting crowded places maybe because of the Islamic practice of visiting mosques for praying prayers. All the major markets, cinemas, gathering halls, and educational institutes were closed at the time of data collection. There was a practice of wearing masks by more than half of the study population (52.7%) when leaving home. There was a similarity in findings regarding wearing masks between the current study and the study conducted in Malaysia.[15] Almost half of the Malaysian population were not wearing masks when leaving home.[15] which indicates that Pakistani population has a high willingness to practice the standard operative procedures released by the World Health Organization except for wearing a mask and avoiding visiting crowded places. Studies conducted on the Chinese population reported opposite findings.[16] There was a contradiction in findings regarding wearing masks between the current study and the study conducted in China.[16] Almost all the population (97%) was wearing masks when leaving home as compared to the Pakistani population.[16] The reason behind this contradiction may be that, unlike the Pakistani population Chinese had previous experience of facing such a pandemic situation of SARS in the early 2000s. Another reason for such practice of not wearing masks in Pakistan may be the shortage of masks in the market because of high demand. Shortage of masks and protective equipment was a global problem.[28] Wearing a mask when ill is also not a common practice in Pakistan which may be the reason for the findings in the current study. Another reason may be the concept that wearing masks is only necessary for COVID-19-positive patients and is not necessary for those who do not have signs and symptoms of COVID-19.

Limitations

For convenience, the researchers collected most of the data by sharing links for the online filling of questionnaires through the researcher ‘s networks on different platforms of social media including Facebook, Facebook Messenger, WhatsApp, and emails which led to the possibility of selection bias as underprivileged may not be able to participate in the study. Additionally, most of the participants were under the age of 40, educated and male.

The KAP instrument was adopted from a study conducted on the Chinese population.[16] There was an addition of one item to both attitudes and practices. In addition, possible different factors contributing to KAP towards COVID-19 such as health literacy[27] and risk perceptions were not assessed in the current study. The authors were unable to collect data from a huge sample population.

Recommendations for future research:

Future research should aim to employ a more systematic and inclusive sampling method to ensure a representative demographic, particularly focusing on underrepresented groups such as the underprivileged and older populations. Expanding the KAP instrument to include additional factors like health literacy and risk perceptions will provide a more comprehensive understanding of attitudes and practices towards COVID-19. Furthermore, increasing the sample size is crucial for enhancing the external validity and generalizability of findings. Utilizing a mixed-methods approach may also enrich the data and insights gained from future studies.

CONCLUSION

The current KAP study concluded that most of the general population of Peshawar district had high knowledge regarding COVID-19. Most of them were very positive towards COVID-19 and were sure that the pandemic situation would be controlled very soon, and Pakistan would win this battle against COVID-19. There was a significant correlation between knowledge and attitudes towards COVID-19.

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