Short Communication

Knowledge, Risk Perception and Behavioral Response of COVID-19 among the General Population Attending Children's Hospital, Lahore

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Abstract

Background: The knowledge, risk perception and behavior of the general population is likely to have an important role in managing the Corona Virus Disease 2019 (COVID-19) pandemic. Awareness of a threat is an important condition for protective action and this needs to be evaluated for appropriate planning.

Objective: To determine the knowledge, risk perception and behavioral response of COVID-19 among the general population attending Children's hospital, Lahore.

Methods: A cross-sectional study was conducted using a structured questionnaire and participants were selected through non-probability convenience sampling technique

Results: A total of 385 participants were interviewed from 24th April till 30th April 2020. The mean age was 38.0±15.43 years and male to female ratio was 1.9:1. Of this 302/385 (78.5%) considered it a real infection and those having higher education believed more as compared to illiterate (p=0.002). Almost one third (n=142, 37%) considered it as a biological weapon developed by some country or terrorist organization. Touching (81.8%) was perceived as a major mode of spread followed by hand shake (74.2%), close physical contact (63.8%) and sneezing (60.2%). The major source of information was television (52.9%) although 51% considered doctors as the most reliable source. Majority considered it to be a serious infection (67.5%) and the perception of acquiring infection and getting serious or dying was higher among old age people (p=0.019). Major reason of anxiety was financial concerns (33.8%) followed by fear of death of a family member (25.5%). The majority was engaged in preventive behaviors like washing hands (90.5%) and wearing face mask (86.2%). The perception of acquiring infection had strong positive correlation with social distancing and wearing mask. 67.8% participants considered lock down essential and 61.1% were satisfied with government's efforts.

Conclusion: The general public attending Children's Hospital had fair knowledge of COVID-19 but there were certain myths, misconceptions and fears attached to the disease. Financial concerns and death of a family member were the major causes of anxiety. Based on this data, the government needs to intensify awareness campaigns to not only encourage preventive measure but to remove myths and alleviate fears related to COVID-19.

Introduction

The Corona Virus Disease 2019 (COVID-19) had its origin in late December 2019 from Wuhan, China.[1] It proved to be a highly contagious disease, spreading throughout the world in a short span of time and was declared as pandemic by World Health Organization (WHO) on 11th March 2020.[2] According to WHO by 10th June, 2020, the number of confirmed COVID-19 cases is 7145539 and has caused 408025 deaths globally. In Pakistan, the first case was reported on 26th February, 2020, and since then the number of cases are gradually increasing and have reached 113702 including 2255 deaths till 10th June, 2020.[3,4] Furthermore it has been predicted that without strict implementation of preventive and aggressive control strategies by 24th June, 2020, 90 % of Pakistani population may have suffered from this virus with possibility of almost 50,000 casualities.[4]

The pathogen responsible for the Covid-19 is named SARS-CoV-2, that was initially considered to be a zoonotic infection, spread through the seafood market of Wuhan but now human to human transmission is considered to be the main reason of rapid spread. It is mainly transmitted via respiratory droplets when infected human sneeze or cough.[5,6,7] There is also some evidence of aerosol transmission, direct contact and feco-oral transmission.[7] The incubation period ranges from 2 days to 2 week after exposure. The patient may have no symptoms or mild symptoms (80%), moderate and serious disease (15%) or critical illness (5%) that includes fatal pneumonia, acute respiratory distress syndrome or acute myocardial injury.[7,8] Therefore major concern is that asymptomatic and mildly affected patients might remain undiagnosed and yet most easily keep spreading the virus. .In the absence of vaccine and any definitive treatment, the main focus is on early detection and preventive strategies.[5] In such pandemics, the success of preventive policies mainly depend on behavioral response of community and precautionary measures taken by them, like frequent hand washing, use of face make, social distancing and self-isolation if symptomatic. The people having a high-risk perception and knowledge of the disease are expected to be more complaint to protective behaviours.[9]

There is limited data on factors affecting response in past pandemics in initial stages when preventive actions are most needed. The older people, females, educated people, and one having high anxiety or trust in government policies are more likely to modify their behavior accordingly.[10] It is yet not clear however, that how much knowledge people have regarding COVID-19 risks, how they are modifying their life-style during this pandemic, and factors that determine spread and control of disease.[11] Pakistan being a developing country is facing its own challenges like poverty, illiteracy, religious beliefs, and limited medical resources. Hence, we find it is of utmost importance to study knowledge of disease, its risk perception and behavioral response of Pakistani nation and factors influencing their behavior. Moreover we are unaware of any such data regarding ongoing pandemic and considering its evolving nature, this data might be helpful for medical professionals, government policy makers and WHO to formulate better strategies to cope up with this global crisis especially in developing countries like Pakistan.

Methods

This was a cross-sectional study conducted on the general population attending The Children's Hospital and Institute of Child Health (CH&ICH), Lahore. The data was collected from 24th April till 30th April, 2020, during the COVID-19 pandemic and while lock down was strictly implemented in Pakistan. The non-probability convenience sampling was used to interview 385 visitors aged >19 years and willing to give informed consent. The attendants of critically sick patients and people suffering from mental illness were excluded. Sample size of 385 was calculated through open Epi, Info, Version 3, developed by Rollins school of Public health, with 50 % anticipated frequency of behavior response and confidence level of 95%. The questionnaire consisted of four parts; first part was related to socio-demographic information of respondents, second part consisted of 11 questions to determine knowledge regarding COVID-19, third part to assess risk perception of respondent comprised 11 questions and fourth part included 12 questions regarding behavioral response in this outbreak. The questionnaire was developed in English and Urdu and approved by institutional review board of the CH&ICH, Lahore. The information collected was analyzed by using statistical software SPSS-25. Mean and the standard deviations were calculated to estimate the study results. Chi-

square test was applied to see correlation of categorical variables with risk perception and p-value $\leqslant$ 0.05 was taken significant. Pearson Correlation test was applied to assess correlation between various risk perception and preventive measures adopted by participants.

Results

The mean age of the participants was 38.0 ($\pm$ 15.43) years. Of 385 participants, majority was young between 19-40 years (n=263,68.5 %). The participants were mainly males (n=250, 65.1%) with male to female ratio of 1.9:1. As regards their profession, majority were self-employed (n=129,33.3 %) or unemployed (n=105,27.3%). The educational status and socioeconomic status as defined by their monthly

Table1: *Social Demographic Characteristic of Participants (n=385)*

Age	Frequency	Percent
19-40 years	263	68.5
40-60 years	99	25.8
>60 years	22	5.7
Total:	*384*	*100.0*
Gender	**Frequency**	**Percent**
Male	250	65.1
Female	134	34.9
Total:	*384*	*100.0*
Education	**Frequency**	**Percent**
Illiterate	99	25.8
Up to Grade 5	77	20.1
Up to Matric	107	27.9
Graduation	56	14.6
Masters	19	4.9
Professional Degree	26	6.8
Total:	*384*	*100.0*
Employment	**Frequency**	**Percent**
Govt. Employee	68	17.7
Private Employee	80	20.8
Self-Employee	107	27.9
Unemployed	105	27.3
House wife	24	6.3
Total:	*384*	*100.0*
Monthly Income	**Frequency**	**Percent**
20,000	210	54.6
20,000 – 50,000	121	31.5
50,000 – 100,000	26	6.8
100,000	27	7.0
Total:	*384*	*100.0*

income is shown in Table 1. Most of the participants were either relative (n= 137,40.9%) or parents of patients (n=157,35.7%), whereas some (n= 39,10.2 %) were drivers of the hospital staff or rickshaw drivers (n=35,9.1%), visitors of staff or (n=16, 4.2%) came for some other purpose.

Knowledge Regarding COVID-19

The awareness of basic elements of COVID-19 was quite good among respondents. The majority (n= 302,78.5 %) of participants agreed that it is a real infection whereas a few people (n=83,21.4%) were not sure or disagreed. The people having higher education believed more as compared to illiterate (P= 0.002). More than one third participants (n=142, 37%) considered it likely to be a bioweapon developed by some country or terrorist organization, whereas 44%(n=169) negated and 19% (n=73) were having a neutral opinion. Majority knew that virus could spread through different modes like touching, handshake, close physical contact and sneezing (Table. 2). Majority of participants regarded fever (n= 325, 84.7 %) and cough (n=323,84.1%) as the most common symptom, only 18.8% (n=72) recognized difficulty in breathing as symptom of COVID-19 and same was the case with symptoms of myalgia, chest pain, headache respectively. NO one recognized diarrhea as its presenting feature. The television (n=203, 52.9%) was major source of information whereas doctors (n=194,51%) were considered the most reliable source. A large majority of respondents (n= 368, 95.6%) knew that there is no definitive treatment for COVID-19 and (n=20,5.2 %) considered home remedies can be protective against this virus.

Risk Perception

A significant number of participants (n=228,59.2%) considered they are likely to catch this infection and 221(58%) thought average Pakistani is likely to get infected, whereas few (n= 201,52.5%) considered that it is very likely that their family members will acquire it too. Two thirds of the participants (n=257, 67.5%,) considered it to be a serious infection in general. Almost half of the respondents (n=201,52.2 %) thought that they were likely to get seriously ill or die due to this virus. Those who perceived that their family member are likely to get serious infection or die of COVID-19 were 37.1% (n=143) and another

Table 2: *Knowledge Regarding COVID-19*

Knowledge regarding Covid-19					
Do you think it is a real infection?	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
	112 (29.2%)	190(49.5%)	39(10.2%)	31(8.1%)	12(3.1%)
Is this a bioweapon developed by a country or terrorist organization	Very Likely	Likely	Neutral	Less Likely	Very less likely
	48(12.5%)	94(24.5%)	73(19%)	111(28.9%)	58(15.1%)
Mode of Spread		Yes		No	
Touching		314(81.8%)		70 (18.2%)	
Close Physical Contact		245(63.8%)		139(36.2%)	
Hand shake		285(74.2%)		99(25.8%)	
Sneezing		231(60.2%)		153(39.8%)	
Food		62(16.1%)		322(83.9%)	
Signs and Symptoms		Yes		No	
Fever		325 (84.65)		59(15.4%)	
Cough		323(84.1%)		61(15.9%)	
Pain		199(51.8%)		185(48.2%)	
Difficulty in breathing		72(18.8%)		312(81.3%)	
Myalgia		58(15.1%)		326(84.9%)	
Chest Pain		53(13.8%)		331(85.2%)	
Age group at high risk for getting serious infection	Children <19 years	Adults 19-40 years	Adults 40-60 years	Old >60 years	
	59(15.4%)	38(9.9%)	51(13.3%)	236(61.5%)	
The major source of information regarding corona virus	Social media	TV	Doctor Nurses	Govt. website	Family Friend	Print Media
	63 (16.4%)	203(52.9%)	76(19.8%)	24(6.3%)	12(3.1%)	6(1.6%)
Most reliable information	47(12.2%)	116(30.2%)	194(50.5%)	22(5.7%)	5(1.3%)
Are you using any prophylaxis against this virus		20(5.2%)		364(94.8%)	
Is there any definitive curative treatment available		17(4.4%)		368(95.6%)	
Do you feel its save to allow normal funeral activities of covid-19 infected body		Yes		No	
		2.23(57.9%)		162(42.1%)	

41.8% (n=161) thought it was not likely .The major reason of COVID-19 related anxiety was financial concerns (n=130,33.8%), followed by fear of losing a family member (n = 98,25.5%), own death (n = 54,14 %) and only 7% had no anxiety. The perception of acquiring infection (p=0.019), getting seriously ill or dying (p= 0.002) was higher among people >60years of age. At the time of this study, only 14.5% (n=56) people had a friend, relative or a neighbor infected with COVID-19. The majority (n=223,57.9%) of participants were of view that dead bodies of COVID-19 patients can be safely buried and normal funeral activities must be allowed (Table 3).

Behavior Response

The majority was engaged mainly in preventive measures like frequent hand washing, wearing face mask, avoiding hand shake and social contacts compared to remaining preventive measures (Table 4). The majority 69.4% (n=267) of participants avoided person having cough and fever whereas 47.8% (n=184) refrained from meeting people who travelled back from abroad or health professionals due to fear of getting infected. Most of the (n=239, 62.1%) people were still reluctant to meet people who have fully recovered from this illness. Only few (n=169, 43.9%) people frequently themselves searched information regarding COVID-19. Almost two third (n=261, 67.8%) participants considered that

Table 3: *Risk Perception of General Public Regarding COVID-19*

	Risk Perception						
	Very likely	Likely	Neutral	Less likely	Very less likely	Mean	SD
How likely you feel you can catch this infection	47(12.2%)	181(47%)	47(12.2%)	88(22.9%)	22(5.7%)	2.63	1.13
How likely you feel your family members can catch this infection?	46(11.9%)	155(40.3%)	52(13.5%)	116(30.1%)	16(4.2%)	2.74	1.13
How likely you feel that average Pakistani can suffer from this virus?	53(13.8%)	170(44.2%)	74(19.2%)	66(17.1%)	22(5.7%)	2.56	1.1
How likely you feel you can be the reason of spread of disease to your family and friends?	64(16.6%)	157(40.8%)	46(11.9%)	91(23.65)	27(7.0%)	2.63	1.2
How likely corona virus infection can be serious	95(24.7%)	165(42.8%)	43(11.2%)	67(17.4%)	15(3.9%)	2.32	1.138
What is the chance you have serious complications/death if you get infected?	69(17.9%)	132(34.3%)	62(16.1%)	100(26%)	22(5.7%)	2.66	1.2
What is the chance your family member get serious infection or die because of corona virus	34(8.8%)	109(28.3%)	81(21%)	123(31.9%)	38(9.9%)	3.05	1.162
What is your major reason of anxiety related to corona virus?	You might die	family member might die	Financial concerns	Social isolation	No anxiety	Burial issues related to death	
	54(14%)	98(25.5%)	130(33.8%)	45(11.7%)	27(7.0%)	31(8.1%)	

lock down was essential. The majority (n=235, 61.1 %) expressed satisfaction over government efforts during this pandemic at the time of interview.
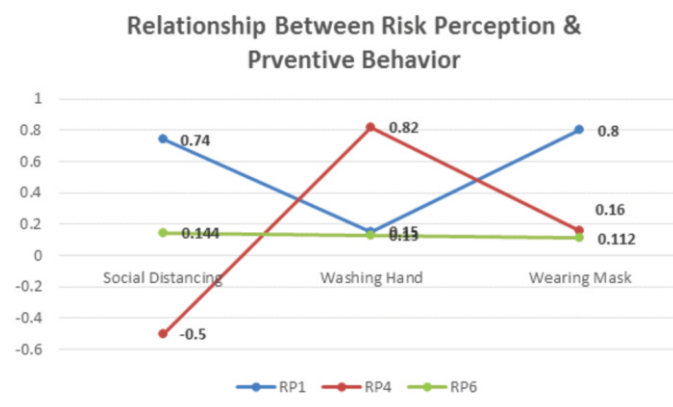

Figure 1: *Relationship Between Risk Perception & Preventive Behavior*

RP1 how likely you feel you can catch this infection

RP4 how likely you feel you can be the reason of spread of disease to your family and friend

RP6 what is the chance you have serious complication death if you get infected

The perception of likelihood of personally acquiring COVID-19 had strong positive correlation with social distancing ® 0.74, p= 0.146), slightly positive correlation with washing hand (r 0.15, p=0.002) and positive correlation with wearing mask (r 0.8, p= value 0.23), Figure 1. There was also slight positive correlation between perception of getting serious or dying of COVID-19 and social distancing (r 0.144, p= 0.005), washing hand (r0.139, p = 0.006) and wearing mask (r 0.112, p=0.029). The likelihood of transmitting infection to family had slight negative correlation with social distancing (r – 0.15, p=0.77) but positive correlation with washing hands (r0.82, p= 0.107) and slight positive correlation with wearing mask (r 0.16, p= 0.007).

Discussion

A key principal of health behavior is that awareness of a threat is an important condition for protective action. The evidence supports the idea that higher perceptions of risk motivate people to engage in prevention and modified behaviors. An important component of surveillance has always been assessing the population's perceptions of risk of developing or contracting a disease. In China, lessons learned from the SARS outbreak in 2003 suggest that knowledge and attitudes towards infectious diseases are associa-

Table 4: *Behavioral Response of COVID-19*

Behavioral response					
What precautionary measures are you taking to avoid getting infected				**Yes**	**No**
Precautionary measure taken				**Yes**	**No**
Washing hand				348(90.5%)	37(9.5%)
Wearing mask				332(86.2%)	53(13.8%)
Avoiding hand shake				223(57.9%)	162(42.1%)
Avoiding social contact				207(53.8%)	178(46.2%)
Social distancing				182(47.3%)	203(52.7%)
Avoid touching face, nose & mouth				146(37.9%)	239(62.1%)
Avoid traveling				114(29.6%)	271(70.4%)
Using disinfectants for home				84(21.8%	301(78.2%)
Self-isolating if cough & fever				77(20%)	308(80%)
Precautionary measure taken					
How frequently you wash hand with soap?	**Very frequently**	**Frequently**	**Occasionally**	**Rarely**	**Never**
How frequently you wear mask?	79(20.5%)	212(55.1%)	77(20%)	12(3.1%)	5(1.3%)
How often you avoid social gatherings	94(24.4%)	94(24.4%)	115(29.9%))	42(10.9%	40(10.4%)
How frequently you search actively information regarding corona virus	47(12.2%)	122(31.7%)	88(22.9%)	71(18.4%)	57(14.8%)
Do you avoid close contact with person having cough and fever				**Yes**	**No**
				267(69.4%)	118(30.6%)
Do u avoid travelling other than for job, essential grocery or medical purpose				246(63.9%)	139(36.1%)
Do you avoid meeting people who have recovered from covid-19				239(62.1%)	146(37.9%)
Are you avoiding meeting people of specific sect, area or occupation like health professional due to fear of getting infected				184(47.8%)	201(52.2%)
Are you satisfied over Governments effort during this outbreak?	**Very Satisfied**	**Satisfied**	**Neutral**	**Dissatisfied**	**Very Dissatisfied**
	58(15.1%)	177(46%)	54(14%)	80(20.8%)	16(4.2%)
Is lock down essential	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strong disagree**
	117 (30.4%)	144(37.4%)	39(10.1%)	70(18.2%)	15(3.9%)

ted with the level of panic emotion among the population, which can further complicate attempts to prevent the spread of the disease.[12] Behaviors like stigmatization, under or overestimation, fears leading to panic emotions, and false measures to avoid infection affect the battle against such a situation.[13] The evidence has shown that risk perception is a subjective psychological construct that is influenced by cognitive, emotional, social, cultural, and individual variation both between individuals, and between different countries and cultures.[14-17] The risk is socially negotiated based on people's experiences, values, and trust in institutions and governments.[18]

The COVID-19 pandemic is not only a global health emergency but is the most crucial political, social and financial challenge of modern times the world is facing after World War II. Attempts are being made world over to control or at least slow down its spread. Research is underway not only to find its cure but a huge investment is being done to find a vaccine.[19] Until a definitive treatment is available; we need to rely mainly on preventive measures to stop its spread. The better the knowledge about diseases and its severity and higher the risk perception, better are the chances that people will be complaint with preventive measures. Worldwide such surveys have been conducted online assessing the knowledge, attitude, perception and psychological impact of this disease.[11,20] In this study we have interviewed the participants in person, hence our study sample seems to be better representative of general public of Pakistan considering a very high illiteracy rate of Pakistan.[21] The study was conducted during strict lockdown in

Pakistan and by that time total cases in Pakistan were only 10513 and 224 deaths.[22] Although majority (78.7%) of people agreed that COVID-19 is real infection, a significant percentage of the population's perception was unreal. Almost one third of respondents took it to be a bioweapon of some country or terrorist organization that was almost same as a previous COVID-19 study conducted on USA and UK residents.[22] This is a very important observation which needs serious note and an effort to change this perception by using all kinds of electronic media, print media, local religious leaders and a constant public message.

Fever and cough was recognized as major symptom by 84.65% and 84.1% people respectively, whereas in an Indian study only 18.2% recognized fever and only 17.3% considered cough as symptom of this disease.[11] Most of the people had good knowledge about mode of spread too. The major source of information regarding COVID-19 was television similar to study conducted in Iran.[8] The majority believed that doctors are the most reliable source of information. This trust should be utilized by inviting medical experts on the mainstream national media channels as guest speakers and invite general public for open-ended question answer sessions. The real situation of admitted patients in the country should be told through these programs with pictorial and live videos of the hospitals. As majority of the public is not literate local beliefs have to be discussed and discarded. In a study from Egypt the knowledge was mainly acquired through social media platforms and the Internet, which has pros and cons. The knowledge however, was lower among older, rural, less educated, and lower income groups. This may necessitate more efforts or using different tools to communicate with these groups.[22] Social media is a powerful tool in our country too and needs to be used more effectively.

The initial data has shown that old age is a risk factor and people with co-morbidity are at a higher risk too. Our population pyramid is different from Europe and USA as majority of our population is young. In our study 59.2% and 52.5% participants felt either they or their family member respectively are likely to acquire this virus compared to only 22.7% and 33.7% people in a similar study conducted by Lars et al in Germany.[23] The older people perceived higher risk of catching as well getting serious or dying whilst study by Lars et al. found that older people thought they are less likely to get infected compared to adults.[23] Our parents and grandparents live with us at home rather than nursing homes. This aspect needs to be exploited to press people to follow the SOPs not only for themselves but also for their elders at home.

More than 4/5th of participants were wearing mask and washing hand, but only half were avoiding social contact or maintaining social distance and only 1/5th were using disinfectant for home. The adherence to all these preventive measure was much higher (> 4/5) among Indians as observed by Deblina Roy et al .20 Our study showed that higher the risk perception of acquiring infection or getting seriously ill, more likely people engage in protective behaviors. It was also observed that COVID-19 has been stigmatized as people were avoiding health professionals, people returning from abroad and even people who have completely recovered from this illness.

Our study revealed an important finding that as lock down was firmly implemented and government ensured its effectiveness, almost 61.1% people showed satisfaction over government efforts during this pandemic compared to 54.5% people showing trust on their government in study conducted in Germany.[24] The majority (67.8%) of people believed lockdown are essential. As present there is an alarming increase in number of cases in Pakistan especially after lifting lockdown before Eid and it is even more important to implement the preventive measures and educate public at large to decrease the spread of this disease as well as prevent the healthcare system from being bogged down by the massive rise of severe and critical cases.

There are certain limitations of our study. Firstly it was conducted in a Children's Hospital where people were either visiting to see admitted children of their relatives or were related to hospital staff in various ways. The data reflects opinion of a relatively select group and may not reflect a holistic picture. Secondly, it was conducted in a government hospital, so might include more people from lower socioeconomic strata. Thirdly majority of people interviewed were relatively young. Many of our results however, do not appear to be age dependent and considering strict lock down and closure of most private hospitals we still consider our study sample is fairly representative of general public.

Conclusion

The general public attending Children's Hospital had fair knowledge of COVID-19 primarily acquired through television. There were however, certain myths, misconceptions and fears attached to the disease. Financial concerns and death of a family

member were the major cause of anxiety. The risk perception of the disease influences the adaptation of preventive measures and the government needs to intensify awareness campaigns to not only encourage preventive measure but to remove myths and alleviate fears related to COVID-19. Our results do provide an insight into the knowledge as well as psychological and behavioral states during early phase of this pandemic and are key in developing preventive strategy to combat this disease.

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