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Knowledge, Attitude and Practices on the Use of Face Mask in the City of Jeddah

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ABSTRACT

Aim: To evaluate the knowledge, attitudes, and practices of using face masks to limit the spread of COVID-19 among citizens and residents in Jeddah.

Methodology: A cross-sectional analytical study was conducted in Jeddah. Electronic questionnaire survey was used to collect data. A total of 18 questions on demographic data, knowledge, attitude, practices and barriers related to the use of masks were framed. The questionnaire was pilot tested.

Results: A total of 460 citizens and residents from the city of Jeddah participated in the study. Highest number of participants believed that vaccinated (1/2 doses) or previously infected individuals must still wear a mask (84.1%) and that mask wearing by infected individuals reduces its spread (90.9%). Participants strongly believed that even those without COVID-19 must wear a mask (93.9%). The hijab/scarf was believed to be a replacement for mask by some (35.2%) or not by others (48.7%), with 16.5% unsure. Majority of the participants (83.5%) believed that they are wearing the mask correctly at all times and that wearing a mask is an important method of preventing spread of corona (95.4%). The duration of mask wearing generally ranged from 1-4 hours, and difficulty in breathing was the most commonly reported barrier to mask wear.

Conclusion: The knowledge score on mask usage was high. Practices were satisfactory but certain aspects needed further reinforcement to optimize mask usage.

Key words: Face mask, COVID-19, Knowledge and Practices

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INTRODUCTION

COVID-19 is a respiratory infection caused by the SARS-CoV-2 virus. The infection in majority cases causes mild to moderate illness. The symptoms reported have been wide ranging including but not limited to high fever, cough, dyspnoea, headache, loss of smell and diarrhea. Reported in Wuhan, China in December 2019 it was designated a pandemic by the World Health Organization on March 11, 2020. As of July 5, 2020, there were 11,125,245 cases of COVID-19 recorded worldwide, with 528,204 fatalities [1-4].

LITERATURE REVIEW

The spread of corona virus occurs either through; (a) droplet transmission of small or large respiratory droplets loaded with virus in close proximity to infected person or airborne transmission over longer distances and time [5]. Increased stress has therefore been put on improved personal hygiene such as: using the soap to wash hands after touching any hard surfaces or using another alternative which is alcohol-based sanitizers, nail neatness and environmental hygiene [6].

Since the beginning of the pandemic, several prevention and control measures have been implemented in most of the countries. The Saudi government has also implemented several public health measures including: restrictions on flights, temporary closure of establishments including malls, shops, schools, universities and curfew to restrict movement of people as deemed necessary [7].

To reduce the spread of COVID-19 [5], on April 3, 2020 the Centres for Disease Control and Prevention (CDC) in the United States advised that people should wear a face mask in public if they can't keep a distance of at least six feet from others [7]. Additionally, a recent animal model study showed that when surgical masks are used, non-contact transmission of SARS-CoV-2 may be decreased from 67% (without masks) to 17% [8]. According to the World Health Organization, improper usage and disposal of face masks might raise the risk of transmission [9]. Moreover, a nonlinear link has been reported between knowledge and practice of using face masks to prevent the spread of COVID-19 across different types of participants [10]. Since the beginning of the pandemic, arguments have been made both: for and against the need for the general population to wear the masks [11]. Nevertheless, in both clinical and laboratory conditions, evidence seems to suggest that transmission of the virus can be reduced significantly, and public spread can be reduced effectively by compliance in wearing mask [12].

Evaluating the various aspects of face mask usage can provide an insight into the current status and make recommendations on public health measures to use the mask optimally. Thus, the aim of this study is to evaluate the knowledge, attitudes, and practices of using face masks to limit the spread of COVID-19 among citizens and residents in Jeddah.

Methodology

The study was approved by the institutional review board. A cross-sectional survey was conducted in city of Jeddah, Saudi Arabia for a period of 6 weeks in the months of May and June, 2021.

Questionnaire

A total of 18 questions were framed in the questionnaire. These included 5 on demographic data, 5 on knowledge, 3 on attitude, 4 on practices and 1 on barriers related to the use of masks.

The questionnaire was pilot tested with 37 respondents. The face validity was assessed based on the responses and the content validity was assessed by feedback from healthcare practitioners.

Study Sample

According to the General authority for statistics of Saudi Arabia the population of Jeddah as of 2019 was estimated to be 4,522,000 and reach 4,697,000 by 2021 [13].

All Jeddah residents located in the city of Jeddah above 18 years of age irrespective of religion, gender, education level, marital status, and occupation were considered eligible for the study.

Assuming that at least 50% of the respondents would have adequate knowledge and satisfactory practices, the sample size was calculated to be 384 using the Open-Source Epidemiologic Statistics for Public Health (Open Epi), v.3.01 at 95% confidence interval. By adding approximately 25 percent contingence for non-compliance to the data collection tool, a total sample size of 500 participants was targeted. The city of Jeddah was divided into 5 zones and the survey was electronically distributed evenly between males and females with 100 people targeted in each zone.

A covering letter was enclosed with the questionnaire stating that the responses would be kept confidential and that response to the survey will be considered as implicit consent.

Statistical analysis: The statistical analysis was done using IBM SPSS version 23. The data was expressed in number of responses and percentages. Analytical statistics was done using chi square test with $p<0.05$ considered statistically significant.

RESULTS

A total of 460 citizens and residents from the city of Jeddah participated in the study. Most participants were females (n=336,73.04%) in the age group of 51 and above (n=162,35.22%) and married (n=299,65%). In terms of education, highest number were with bachelor's degree (n=296,64.35%) with unemployed (n=191,41.52%) forming the largest subgroup (Table 1).

Table 1: The demographic data: gender, marital status, age, education level, and occupation (designation), expressed in terms of numbers and percentages.

Table on demographic data for masks			
Demographic data		**Number**	**Percentage**
Gender	Female	336	73.04%
	Male	124	26.96
Marital status	Single	161	35%
	Married	299	65%
Age	18-25	108	23.48%
	26-35	74	16.09%

	36-50	116	25.22%
	51 and above	162	35.22%
Education level	General	113	24.57%
	Bachelor's	296	64.35%
	Masters	51	11.09%
Designation	Student	96	20.87%
	Business	21	4.57%
	Employee	152	33.04%
	Unemployed	191	41.52%

**Percentages may not be 100% in all cases due to rounding.

As seen in Table 2, highest number of participants believed that vaccinated (1/2 doses) or previously infected individuals must still wear a mask (84.1%) and that mask wearing by infected individuals reduces its spread (90.9%). Participants strongly believed that even those without COVID must wear a mask (93.9%). The hijab/scarf was believed to be a replacement for mask by some (35.2%) or not by others (48.7%), with 16.5% unsure. The overall knowledge score was 83.94%, calculated as the number of respondents with score higher than the average score.

Table 2: Socio demographic factors and their influence on knowledge of Jeddah residents and citizens towards use of masks for prevention of COVID spread. (Y=yes, N=no, NS=not sure).

	Q1				Q2				Q3				Q4				Q5			
	Y	N	NS	p	Y	N	NS	p	Y	N	NS	p	Y	N	NS	p	Y	N	NS	p
Gender (total)	387	41	32	0.038	432	10	18	0.129	428	17	15	0.183	394	41	25	0.031	162	224	74	.000
Female	289	23	24		314	10	12		309	13	4		293	23	20		93	181	62	
Male	98	18	8		118	0	6		119	4	1		101	18	5		69	43	12	
Marital status (total)	387	41	32	0.429	432	10	18	.477	428	17	15	0.008	394	41	25	0.819	162	224	74	0.003
Single	133	18	10		154	4	3		148	11	2		137	16	8		72	72	17	
Married	254	23	23		278	7	14		280	6	13		257	25	17		90	152	57	
Age	387	41	32	0.01	432	10	18	0.191	428	17	15	0.024	394	41	25	0.25	162	224	74	.000
18-25	93	11	4		103	3	2		102	4	2		85	13	10		51	47	10	
26-35	58	3	13		66	1	7		69	5	0		64	8	2		38	25	11	
36-50	97	5	14		109	2	5		102	5	9		104	7	5		26	74	16	
51 and above	139	12	11		154	4	4		155	3	4		141	13	8		47	37	78	
Education level (total)	387	41	32	0.94	432	10	18	0.203	428	17	15	0.751	394	41	25	0.154	162	224	74	0.013
General	93	12	8		104	5	4		105	4	4		90	12	11		55	42	16	
Bachelor's	251	24	21		280	3	13		276	12	8		258	26	12		93	155	48	
Masters	43	5	3		48	2	1		47	1	3		46	3	2		14	27	10	
Designation (total)	381	41	32	0.383	432	10	18	0.377	428	17	15	0.243	394	41	25	0.13	162	224	74	0.05

Student	96	12	4	91	3	2	90	4	2	79	9	8	47	40	9	
Business	19	0	2	19	0	2	21	0	0	19	0	2	5	11	5	
Employee	125	16	11	146	5	1	145	5	2	138	11	3	50	78	24	
Un-employed	163	13	15	176	6	9	172	8	11	158	21	12	60	95	36	

Q1: Do vaccinated (1 or 2 doses of Pfizer or Astrazeneca) OR previously infected individuals, need to wear a face mask?

Q2: Do infected individuals decrease the risk of spreading COVID to others by wearing a mask?

Q3: Is it essential to wear a mask if you don't have COVID?

Q4: Do you need to maintain social distancing after wearing a mask?

Q5: Is covering your face with scarf or hijab a replacement for the use of mask?

[#]Overall score was calculated to be 5. Scores above mean score were considered satisfactory while those below were considered unsatisfactory

On a routine basis a surgical mask was the most frequently used mask (80.4%) while the N_{95} was the least (2.8%). Under conditions perceived as high risk, while surgical mask was still most preferred (61.9%), the use of N95 increased (22.6%). Washing hands or using sanitizer before wearing a mask was performed by 61.5% but 32.6% was not sure (Table 3).

Table 3: Socio demographic factors and their influence on practices of Jeddah residents and citizens towards use of masks for prevention of covid spread. Q1 and Q2 (K=N95/KN95, C =cloth, S=surgical, F=Face shield) and for Q3 (Y=yes, N=no, NS=not sure).

	Q1					Q2					Q3			
	K	C	S	F	p	K	C	S	F	p	Y	N	NS	p
Gender (total)	13	71	370	6	0.185	104	53	285	18	0.312	283	27	150	0.074
Female	11	47	272	6		71	39	210	16		216	16	104	
Male	2	24	98	0		33	14	75	2		67	11	46	
Marital status (total)	13	71	370	6	0.13	103	53	285	18	0	283	27	150	
Single	11	45	237	6		51	39	191	17		90	12	59	0.168
Married	2	26	133	0		52	14	94	1		193	15	91	
Age	13	71	370	6		104	53	285	18		283	27	150	
18-25	0	20	88	0	0.059	35	8	63	2	0.002	60	5	43	0.057
26-35	2	12	60	0		16	12	46	0		38	8	28	
36-50	2	22	90	2		22	18	74	2		75	4	37	
51 and above	9	17	132	4		31	15	102	14		110	10	42	
Education level (total)	13	71	370	6		104	53	285	18		280	27	150	
General	2	21	85	5	0.006	27	7	71	8	0.008	65	8	40	0.077
Bachelor's	7	44	244	1		62	45	179	10		175	19	99	
Masters	4	5	41	0		15	1	35	0		40	0	11	
Designation (total)	26	140	740	12		104	53	285	18		283	27	150	
Student	1	16	79	0	0.19	39	9	46	2	0	56	5	35	0.024
Business	1	2	18	0		4	4	13	0		9	5	7	
Employee	3	24	125	0		31	19	100	2		94	8	50	
Un-employed	8	29	148	6		30	21	126	14		124	9	58	

Q1: Which of the following masks do you use routinely?

Q2: Which of the following do you prefer most when you are in high-risk conditions such as flight travel, being in enclosed spaces such as restaurants, cafes?

Q3: I wash my hands or use hand sanitizer before putting on a mask or after removing it or if I touch the mask.

[#]Overall score was calculated to be 4. Scores above mean score were considered satisfactory while those below were considered unsatisfactory

A majority of the participants (83.5%) believed that they are wearing the mask correctly at all times and that wearing a mask is an important method of preventing spread of corona (95.4%). Nevertheless, 29.3% felt the need for more knowledge on how to wear the mask correctly (Table 4).

Table 4: Socio demographic factors and their influence on attitudes of Jeddah residents and citizens towards use of masks for prevention of COVID spread (Y=Yes, N=No, NS=Not Sure).

	Q1				Q2				Q3			
	Y	N	NS	p	Y	N	NS	p	Y	N	NS	p
Gender (total)	439	10	11	0.642	384	39	37	0.003	135	272	53	0.175
Female	322	6	8		285	20	31		94	198	44	
Male	117	4	3		99	19	6		41	74	9	
Marital status (total)	439	10	11	0.216	384	39	37	0.01	135	272	53	0.374
Single	152	6	3		129	22	10		48	99	14	
Married	287	4	8		255	17	27		87	173	39	
Age	439	10	11	0.001	384	39	37	0.007	50	113	19	.000
18-25	104	3	1		83	17	8		29	66	13	
26-35	70	3	1		63	8	3		21	47	6	
36-50	105	2	9		97	4	15		32	67	17	
51 and above	160	2	0		141	10	11		53	92	17	
Education level (total)	439	10	11	0.568	384	39	37	0.54	49	94	21	0.195
General	108	4	1		90	11	12		38	58	17	
Bachelor's	282	5	9		249	26	21		11	36	4	
Masters	49	1	1		45	2	4		11	36	4	
Designation (total)	376	10	11	0.012	384	39	37	0.002	135	272	53	0.108
Student	29	3	1		73	18	5		27	58	11	
Business	18	0	3		18	1	2		4	11	6	
Employee	144	3	5		136	7	9		53	87	12	
Unemployed	185	4	2		157	13	21		51	116	24	

Q1. Is Wearing a face mask an important method of reducing transmission of COVID?
Q2. Do you believe that you are wearing the mask correctly at all times?
Q3. Do you believe you need more knowledge on how to wear the mask correctly ?

The duration of mask usage was: 2-4 hours (n=160,34.8%), 1-2 hours (n=159,34.3%), 4-6 hours (n=84,18.3%) followed by more than 6 hours (n=49,10.7%). The most commonly reported barrier to the use of a mask was difficulty in breathing (n=269,58.5%) followed by itching around the nose/skin (n=129,28%).

DISCUSSION

The current study was conducted in the city of Jeddah with the objective of recording responses from a diverse cross section of the population. Probability sampling was not feasible in this study because a sampling frame was unavailable. Despite using a nonprobability sampling method, quota sampling was adopted to improve representation in the sample.

Respondents overall knowledge score in the current study was similar to those reported previously within the kingdom [6]. Nevertheless, the scores on mask usage in the current study are comparatively higher. The earlier study was conducted in the initial stages of the pandemic and some of the factors that may have contributed to the widespread increase in knowledge on the use of mask may include: the measures adopted by the ministry of health to spread awareness through social media and educational platforms and regulatory conditions established early in the COVID spread [14]. The results are also comparable to studies in other countries conducted in the later stages of the pandemic [6,15,16,17].

In the current study, respondent's belief that they are wearing the mask correctly differed according to the age groups, gender and marital status. The odds of wearing a mask increased significantly with age in a previous report [18], a finding that can be corroborated from the current study. Females above 51 and married individuals displayed a significantly higher score compared to other groups. Research into perceptions regarding pandemic across several countries suggests that women tend to perceive the pandemic to be a serious threat and are more likely to comply with precautionary measures [18,19]. Unsurprisingly, the above mentioned subgroup

was also open to suggestion and felt the need for more knowledge on the correct use of mask.

The use of surgical mask was by far most preferred for routine use. Cloth mask was the next preferred method, though the use was significantly less. The results from previous studies are mixed. While in China, 16 the use of medical masks was highest, a study in Poland 20 reported that cloth masks were used more. However, in situations where social distancing was perceived to be a challenge, the use of KN_{95} masks was preferred by almost one fourth of the population, though the use of surgical mask continued to be the most preferred. The CDC_7 recommends use of N_{95} masks subject to availability after prioritization for healthcare workers. The increased use of KN_{95} indicates that (a) individuals exhibited a heightened sense of precautionary measures being adopted in challenging situations and (b) the availability of KN_{95} masks was not a hinderance.

As significant number of individuals are getting vaccinated, regulatory bodies are contemplating removal of mask as a mandatory practice. Nevertheless, in the latest guidelines, the CDC recommends that even fully vaccinated individuals should wear a mask in an area of "substantial or high transmission" [7].

In day to day situations, individuals do not wear the mask continuously in a fixed position covering the nose. While half of the respondents followed the CDC guidelines, nevertheless a large number of respondents (almost $1/3^{rd}$) were not sure if they washed their hands or used sanitizer every time they touched the mask to wear or remove it. The improper storage, disposal and practices regarding use of mask has been consistently noted in previous studies as well [15,16]. Future strategies to educate public on mask usage may need reinforcement on the methods to wear and dispose mask correctly.

The traditional use of niqab (females) or shmaagh (males), which are face coverings, warranted a clarification if they may be used as a substitute for face mask. The ministry in Saudi Arabia has clarified that these may be "deemed an alternative for the cloth face mask, provided it is made of several layers of fabric. Furthermore, it should fit tightly when worn, specifically at the nose and mouth areas" [21]. In the current study, respondents were divided on their opinions, with majority still believing that scarf or hijab is not a substitute for mask. Moreover, further research is needed to confirm if the population that believes the traditional covering to be a substitute is actually following the ministry specifications.

The duration of mask use was investigated with majority of respondents using the mask from 1 to 4 hours. Increased duration of usage has been linked to increase itching of the skin [22]. This duration may decrease further if the individual works in a hot atmosphere, needs to talk a lot or any such activity that makes the mask wet [23]. Though not included in the current study, headaches associated with prolonged mask use may also discourage individuals from compliance [24]. Thus public awareness needs to be enhanced on the amount of time a mask may be used to avoid complications and make its use more acceptable.

CONCLUSION

The knowledge score on mask usage was high. Practices were satisfactory but certain aspects needed further reinforcement to optimize mask usage.

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