Research Paper

COVID-19 Caring Behaviors: A Cross-sectional Study in the East of Iran

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ABSTRACT

Background: Some recommendations and health protocols were presented to control COVID-19 after the outbreak, such as the use of face masks, observing social distancing, closure of schools, etc. Despite these protocols, we witnessed different peaks and variants of COVID-19 for more than two years. This study investigated some risky behaviors, such as not wearing face masks, violating social distancing, and attendance at crowded places.

Methods: We used a checklist containing some demographic, caring behaviors, and survey questions. Data were collected from four universities in Iran. Patients with positive PCR results for COVID-19 were included in the study. The minimum sample size required for this study was estimated to be 407, which were selected from the universities by proportional allocation.

Results: The use of face mask proportion was different between the upper and lower age groups of 50 years (P=0.005). Also, this proportion was different in the subgroups of educational level, job status, income, and living area.

Conclusion: The space of most crowded places was confined and many patients did not use face masks and did not observe social distancing in these places. Hence, social distancing and face mask use can be considered the most important caring behaviors to deal with COVID-19.

Keywords: COVID-19, Face mask, Social distance, Hand washing

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1. Introduction

An emergency was declared by the World Health Organization (WHO) about the spreading of COVID-19 on January 30, 2020 [1]. The virus was first seen in China and quickly spread around the world, causing a crisis around the world for more than two years [2].

Many stringent health protocols were used around the world to control the spread of the virus and reduce its morbidity and mortality. The use of masks and observing social distanccing were introduced as the two basic recommendations to prevent COVID-19 morbidity [3, 4]. Strict quarantines, closure of schools and universities, closure of shopping malls, travel bans, sports competitions without spectators, etc. were other rules to control the COVID-19 outbreak [3].

Despite these protocols, the virus became more potent and lethal with faster transmission speed due to various mutations [5, 6]. Five variants of COVID-19 were introduced as the variants of concern by WHO, namely, alpha, beta, gamma, delta, and omicron, which created different peaks of COVID-19 [7]. With the advent of the COVID-19 vaccine and the vaccination of individuals, the severity of the protocols gradually decreased [3].

The first patient of COVID-19 was observed in February 2020 in Iran [8]. Although there was no recommendation to use masks and observe social distancing in the early days of the COVID-19 outbreak in Iran, over time and with the announcement of the WHO, the recommendations were applied [3, 9]. The standard social distance was introduced as a 1.5–2 meters distance between two people [10]. Strict protocols were put in place by the Ministry of Health and Medical Education of Iran with the first COVID-19 peak, such as the closure of schools and universities, closure of shopping malls and restaurants, domestic travel ban, and sports competitions without spectators [9]. Along with these rules, there were some recommendations, like not attending family parties, celebrations, and funerals.

There are some studies about the effect of using face masks, observing social distance, and some other protocols in Iran and other countries [11-19]. In this study, we intend to examine the various behaviors effective in controlling the morbidity of COVID-19 in Iran, such as face mask use, hand washing, observing social distancing, not attending parties, and being present in crowded places. Due to the existence of different cultures in Iran and the paucity of studies concerning caring behaviors in the eastern and southeastern of Iran, it is necessary to conduct such studies in this regard.

2. Methods

The present cross-sectional study was performed at four universities in the eastern and southeastern of Iran, Kerman University of Medical Sciences (200 samples), Sirjan School of Medical Sciences (100 samples), Jiroft University of Medical Sciences (69 samples), and Zabol University of Medical Sciences (47 samples). The total sample size was determined based on a pilot study on 40 patients. In that study, attendance at family parties accounted for the largest percentage, and using the following formula at a significance level of 5% and a 0.5 error, the minimum required sample was 370. Taking into account 10% of non-correct answers, the minimum sample required was 407 people. The sample size of each university was determined based on the allocation in proportion to the approximate share of each university in the total number of positive cases of COVID-19. The samples were selected from medical centers by available sampling (Equation 1).

$$1.\ n = \frac{(Z_{1-\frac{\alpha}{2}})^2\, p(1-p)}{(d)^2} = \frac{(1/96)^2(0.6\times 0.4)}{(0.05)^2} \approx 370$$

Patients above 18 years of age with positive PCR results for COVID-19 were included in the study. The information was extracted from a checklist (obtained from a quantitative study) from September 2021 to February 2022. The checklist included demographic information (age, sex, educational level, marital status, job, income, family size, and the number of daily face-to-face visits), questions about health protocols (yes/no answer), and survey questions about the impact of some factors on the prevalence of COVID-19 (yes/no answer). The validity of the checklist was checked by ten experts with a content validity index (CVI), and its value was 0.87. The data were collected from patients with COVID-19 that visited the hospitals for treatment, from July to October 2021. The checklist was completed by the patients. The inclusion criteria were adults (≥18 years) with positive test results for COVID-19. Reluctance to participate in the study was the exclusion criterion. Individuals with missing data were excluded from the calculations. Although this issue was considered in the sample size calculation.

Health protocol questions were about the use of face masks, attending a family party, celebration, or funeral in the last two weeks, unnecessary travels, attending religious ceremonies without observing health protocols, attending

crowded shopping malls, referring to government departments and banks, and disinfection and hand washing in the last two weeks. Along with these questions, there were some sub-questions. For using a face mask, the type of mask, time to change the mask, and observing the social distance were asked. Also, for questions about attending family gatherings and crowded places, some additional information was asked from the patients, such as using face masks, observing social distancing, and the existence of proper ventilation.

The survey questions were about the reopening of schools and universities, the impact of the economic problems, reducing the fear of COVID-19, fatigue from quarantine and health protocols, lack of executive guarantee in observing health protocols, and lack of proper home planning to fill leisure time.

We used descriptive statistics, like Mean±SD, and percentage for describing data, and the chi-square test was used to investigate the relationship between face mask use and some demographic variables by considering 0.05 as the error level. All analyses were done using SPSS software, version 21.

3. Results

The mean age of participants was 40.5±13.4 years and the mean number of family members was 3.9±1.4. Two-hundred fourteen patients (52.1%) were female and 335 individuals (82.1%) were living in cities. In addition, 315 participants (76.6%) were married. Concerning the educational level, 244(59.4%) and 145(35.3%) cases had a diploma and university degree, respectively. Regarding job status, 172 cases (42.6%) were employees. More characteristics of the patients using face masks and

Table 1. General characteristics of the subjects based on face mask use

Variables		Total	No. (%)		P*
			Face Mask Use		
			Yes	No	
Age group (y)	<50	310(77.3)	293(94.5)	17(5.5)	0.005
	≥50	91(22.7)	78(85.7)	13(14.3)	
Gender	Male	197(47.9)	178(90.4)	19(9.6)	0.049
	Female	214(52.1)	204(95.3)	10(4.7)	
Marriage	Single	96(23.4)	86(89.6)	10(10.4)	0.180
	Married	315(76.6)	295(93.7)	20(6.3)	
Educational level	Illiterate	22(5.4)	14(63.6)	8(36.4)	<0.001
	Diploma	244(59.4)	227(93.0)	17(7.0)	
	Bachelor and higher	145(35.3)	141(97.2)	4(2.8)	
Occupation	Self-employed	126(31.2)	109(86.5)	17(13.5)	<0.001
	Employee	172(42.6)	170(98.8)	2(1.2)	
	Unemployed	106(26.2)	95(89.6)	11(10.4)	
Living area	Urban	335(82.1)	315(94.0)	20(6.0)	0.022
	Rural	73(17.9)	63(86.3)	10(13.7)	
Number of daily face-to-face visits	<5	93(22.9)	86(92.5)	7(7.5)	0.989
	5-20	187(45.9)	173(92.5)	14(7.5)	
	>20	127(31.2)	118(92.9)	9(7.1)	
Income	<20	79(20.4)	62(78.5)	17(21.5)	<0.001
	20-50	100(25.8)	96(96.0)	4(4.0)	
	50-80	153(39.4)	149(97.4)	4(2.6)	
	>80	56(14.4)	51(91.1)	5(8.9)	

*Chi-square test. The level of significance was 0.05.

Table 2. Frequency of COVID-19 risky behaviors

Risky Behaviors	No. (%)					P*
	Total	Kerman	Sirjan	Jiroft	Zabol	
Not using masks	30(7.2)	14(7.1)	6(6.0)	6(8.7)	4(8.5)	0.904
Attending a family gathering	246(59.4)	117(59.1)	70(70.0)	38(55.1)	21(44.7)	0.024
Attending celebrations or funerals	181(43.7)	76(38.4)	58(58.0)	35(51.7)	12(25.5)	<0.001
Unnecessary travels	62(15.0)	40(20.2)	8(8.0)	13(18.8)	1(2.1)	0.002
Religious ceremonies without observing health protocols	96(23.3)	32(16.2)	50(50.0)	14(20.3)	0(0.0)	<0.001
Attending crowded shopping malls	248(60.5)	114(58.8)	84(84.0)	34(49.3)	16(34.0)	<0.001
Visiting government departments and banks	280(68.1)	131(66.5)	73(73.0)	53(76.8)	23(51.1)	0.021
No disinfection and hand washing	164(40.0)	85(43.8)	48(48.0)	17(24.6)	14(29.8)	0.005

*Chi-square test

those who did not use them are shown in Table 1. The association between wearing face masks and age, educational level, job, living area, and income was significant. The significance of the gender variable was critical.

Table 2 shows the risky behaviors during COVID-19 and the number of patients who were at risk. Attending crowded places, like shopping malls (60.5%) and banks (68.1%) was the most frequent factor followed by attending a family gathering (59.4%).

Among patients who used face masks, 258 subjects (67%) changed the mask after one day or more, and 313 (81.3%) cases had used 3-layer masks. Also, 269 cases (71%) maintained social distancing in public places along with the use of face masks. Concerning family parties, 190(76.9%) of them were held in confined spaces and 227 cases (93%) attended parties with a population of more than five people. In this regard, 167(69%) of the subjects attending family parties did not use face masks and did not maintain social distancing as well. Among people who attended celebrations or funerals in the last two weeks, 127 cases (66.8%) were in confined spaces, the population of 150(78%) ceremonies was more than 50, and the frequency of the subjects who did not use the face masks and did not maintain the social distance was 93(48.4%) and 96(50%), respectively. Only ten cases (4%) who were referred to the shopping malls in the last two weeks did not use face masks, and 79 cases (31.5%) did not maintain social distancing. Besides, among the people who went to the offices and banks, 58 cases (21%) did not use face masks and 111 subjects (39.9%) did not maintain social distancing.

Table 3. Frequency of survey questions

Questions	No. (%)
Did the reopening of schools and universities affect the outbreak of COVID-19?	262(63.4)
Did the economic problems affect the outbreak of COVID-19?	261(63.7)
Did the reduced fear of morbidity affect the outbreak of COVID-19?	310(75.8)
Did the fatigue from quarantine and health protocols affect the outbreak of COVID-19?	199(47.8)
Did the lack of executive guarantee in observing health protocols affect the outbreak of COVID-19?	278(66.8)
Did a lack of proper home planning to fill leisure time affect the outbreak of COVID-19?	174(41.8)

Table 3 shows the frequency of the positive responses to the survey questions. Diminished fear of the disease and lack of executive guarantee in observing health protocols showed the most positive responses with 75.8% and 66.8%, respectively.

4. Discussion

This study investigated the caring behaviors related to the COVID-19 outbreak. Some behaviors, like using face masks, and attending family parties, celebrations, funerals, banks, and shopping malls were surveyed among the COVID-19 patients.

Totally, 92.8% of the patients reported using face masks. There are various results regarding the proportion of wearing face masks in different regions of Iran. For instance, the percentage of wearing face masks in Hamedan, Shiraz, and Ahvaz was 55.1, 95.2, and 45.6, respectively [17-19].

Based on the results of Table 1, there were significant differences in the percentage of using face masks among some demographic variables. The percentage of wearing face masks was higher in the age group under 50 years than in the other groups (94.5% vs. 85.7%). Also, this percentage was higher in the literate subjects (59.4% with diplomas and 35.3% with bachelor's or higher degrees), employee group (42.6%), urban people (82.1%), and those with an income level of between 50 and 80 million Rials. It seems that some socioeconomic factors, such as income level, living area, and educational level are important in wearing face masks. In addition, the higher percentage of wearing face masks in employees could be due to strict health protocols for them in the offices and organizations. The significance of gender was critical (P=0.049) and there is a need for a larger population to evaluate the association between gender and the use of face masks. Evidence shows that the proportion of face mask use was different in women [18], older cases [17, 18], and those with a lower educational level [17].

Although most patients used face masks (92.8%), going to governmental organizations and banks, crowded shopping malls, family parties, and celebrations were more frequent risky behaviors of COVID-19 patients. Besides, 40% of patients did not regularly disinfect their hands. Numerous studies have shown that the use of face masks is effective in the prevention of transmitting COVID-19 [13, 16, 20]. However, this was low in the early COVID-19 outbreak [14].

While a mask should be replaced after a maximum of 8 hours, 67% of the patients wore a mask for a day or more. This behavior can increase the risk of contracting COVID-19 in people who use face masks. Confined space is another issue affecting catching COVID-19 where most of the family gatherings (93%) as well as ceremonies and funerals (66.8%) were held in these places with high population density.

Maintaining social distance is an important behavior for COVID-19 prevention [21, 22]. However, this protocol was not considered at many parties and celebrations. As mentioned in the results, the percentage of people observing social distance related to using masks, attending crowded shopping centers, and going to offices and banks was 79%, 69.5%, and 60.1% respectively. Although the appropriate social distance is between 1.6 and 3 meters [15], Soltanian et al. showed that the social distance between people was much lower than the standard level [19].

According to 76% of patients, diminished fear of the disease affected the spread of COVID-19. Indeed, the decrease in fear led to less adherence to health protocols and recommendations. On the other hand, the lack of enforcement guarantees in health protocols, based on the opinion of 70% of people, had intensified the spread of the disease. The reopening of the schools and universities along with the economic problems were two other important issues affecting the increase of COVID-19 patients.

5. Conclusion

Based on the obtained results, attending family parties, funerals, celebrations, and crowded places were the most common risky behaviors. Crowded places with confined spaces, not maintaining social distancing, and not wearing face masks can increase the risk of COVID-19. It seems that observing health protocols is necessary to control COVID-19. In the meantime, the use of face masks and maintaining social distance are the most important caring behaviors.

One of the limitations of this study could be the lack of correct recall of the events and the other one was the possible wrong answer from the participants. Also, we were planning to do the current study in more cities, but we were accompanied by a lack of cooperation from other universities. These limitations can be considered as study weaknesses. On the other hand, the appropriate sample size and the data obtained from four different universities can be pointed out as the study's strengths.

Due to the lack of proper ventilation, lack of social distancing, and the lack of wearing masks in crowded environments, we can try to solve these problems with proper planning.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Sirjan School of Medical Sciences (Code: IR.SIRUMS.REC.1400.002) and performed in accordance with the principles of the Declaration of Helsinki.

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Authors' contributions

Conceptualization: Abbas Mohammadi; Methodology: Reza Sadeghi, Mohammad Moqaddasi Amiri; ; Investigation: Mahmood Reza Masoudi; Data curation: Reza Sadeghi, Gholamreza Asadikaram, Mohsen Karbalaei and Leili Rezaie Kahkhaie; Formal analysis: Mohammad Moqaddasi Amiri; Project administration: Reza Sadeghi; Supervision: Abbas Mohammadi and Mahmood Reza Masoudi; Writing the original draft: Amin Beigzadeh, Mohammad Moqaddasi Amiri; Writing, review, and editing: all authors.

Conflict of interest

The authors declared no conflicts of interest.

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