



# Predictors of Online Health-Related Behaviors Among Healthcare Workers During Covid-19 Outbreak in Iran

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## ABSTRACT

This study sought to identify the factors that influence online health-related behaviors among Iranian healthcare workers during the COVID-19 outbreak. The study utilized the Uses & Gratification and Self-Determination theories to explain the factors associated with workers' behaviors and their use of social media to share information about the pandemic. A decision tree technique known as the Chi-Square Automatic Interaction Detector (CHAID) was used to analyze the responses of 406 participants. The results revealed that healthcare workers' engagement in online health-related behaviors was primarily influenced by their attitude and motivation to use social media during the epidemic. Attitude was identified as the most important and first factor, while motivation was the second factor. The usefulness of information and interactions in the face of a health crisis can be linked to the development of self-efficacy and the promotion of social capital, as well as satisfaction with media. In conclusion, this study highlights the importance of understanding the factors that drive healthcare workers' engagement in online health-related behaviors during a pandemic. The findings can be used to develop strategies to promote the use of social media for health-related purposes and improve healthcare workers' response to future pandemics.

**Keywords:** Predictors, COVID-19 outbreak, healthcare workers, Iran, online health-related behaviors.

## 1. Introduction

The emergence of the COVID-19 crisis in the twenty-first century had far-reaching consequences in a variety of societies all over the world. Loss of family and loved ones, fear of illness, loneliness and social isolation, abrupt changes in living and working conditions, economic difficulties, and feelings of threat and insecurity about the future are all unpleasant situations that can threaten society's mental health (1). Experiencing situations like

these and undergoing emotional states such as worry, anxiety, and uncertainty regarding the crisis and its consequences can heighten the motivation to actively seek information from diverse sources on social media (2). On the contrary, certain studies have revealed that specific situations, such as epidemics, can have a detrimental effect on social trust, as well as public beliefs and attitudes towards policymakers and government officials (3). When the credibility of official and organizational information regarding the epidemic diminishes, individuals tend to rely

on online news, interpersonal networks, and social media as alternative sources for obtaining new information (4). Based on the findings of studies conducted during the pandemic, a significant portion of both the general population and healthcare providers obtained information about COVID-19 from social media platforms (5, 6). Sharing accurate information, professional experiences, and engaging in constructive discussions among individuals with diverse perspectives on online social networks not only enhances social support and capital during times of crisis but also rectifies and modifies beliefs by countering misinformation and misperceptions (7, 8). Being exposed to opposing viewpoints and corrective information, however, can be advantageous in dispelling irrational fears and alleviating obsessive-compulsive anxiety (9, 10). According to research findings, media satisfaction can play a significant role in shaping or altering ideas and beliefs, as well as influencing the type of response, such as behavior change, to a problem or crisis during such interactions (11, 12). According to the definition provided by Baeza-Yates and Lalmas (2012) (13), a user's desire to use the Internet for an extended period is closely linked to their engagement. Consequently, the quality of experience, including positive evaluation and satisfaction, becomes a significant and influential factor. Additionally, from a social psychology perspective, which acknowledges motivation as a guiding factor in behavior (14, 15), it can be understood why activities and interactions take place within a system or society. Motivation, as explained by the self-determination theory (SDT), can stem from internal stimuli, such as the fulfillment of needs related to emotions and cognition, or it can be influenced by external factors, such as rewards. Since this study aims to investigate the determinants of online health-related behaviors during the COVID-19 epidemic, a research framework combining uses & gratification and self-determination theories was chosen (16-18). While the role of media in raising awareness and influencing society during a health crisis is widely recognized, there has been limited research conducted on this topic in less developed countries like Iran. It is crucial to understand the factors that impact the exchange of information, personal experiences, and opinions in order to effectively manage social and health crises. Additionally, identifying the mechanisms that influence information flow within and between social networks can be valuable not only during crises but also in navigating other sensitive socio-political situations.

## 2. Methods and Materials

### 2.1. Study Design and Participants

This study was conducted using a descriptive-analytical approach and involved 406 workers, including staff and faculty members, at Birjand University of Medical Sciences. The study was conducted in Birjand, the capital of South Khorasan Province in eastern Iran, as well as the university-affiliated cities of Tabas, Ferdows, Ghaen, and Sarayan, which were chosen as sampling units. The inclusion criteria for the study were university employment, access to a smartphone, and the ability to use it, while refusal to cooperate and incomplete questionnaire were exclusion criteria. The convenience sampling method was used, and data was collected through the distribution of a questionnaire link among the university's job groups and the distribution of a paper questionnaire if the participant preferred it. To collect data for this study, the research instrument included a checklist and a researcher-made questionnaire that were validated by ten experts. The experts included four in health education and promotion, one in biostatistics, two epidemiologists, one health policymaker, one in health service management, and one in food health and safety. The checklist was divided into four sections to assess explanatory variables:

### 2.2. Data Collection

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#### 2.2.1. Measure

The questionnaire used in this study consisted of four sections. The first section included 12 questions to gather demographic information and characteristics such as age, gender, marital status, number of children, work experience, education, job, and income. The second section aimed to collect information about social media memberships (Facebook, Instagram, Twitter, Telegram, WhatsApp, LinkedIn, YouTube, and others) and measured weekly social media usage. Three questions were included in this section, and the responses ranged from more than 20

hours to less than 7 hours. The third section included three questions on a five-point scale to assess the duration of communication with friends and relatives per week. The responses ranged from daily to rarely, and the midpoint and arithmetic mean were used for scoring. The fourth section examined the types of activities people engage in on social media, and it included eight questions with two answer options (1 = yes and 0 = no). The questions focused on activities such as exchanging music and videos, exchanging photos and videos, exchanging text and audio messages, video calling, shopping, contacting healthcare professionals, and receiving or submitting scientific content.

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To measure the outcome of the study, the researchers developed an eight-item questionnaire. The first six questions were designed to assess online health-related behaviors during the COVID-19 pandemic, while the remaining two questions aimed to evaluate attitudes towards social media. The validity of the questionnaire was confirmed by ten experts, as mentioned earlier, and the reliability of the instrument was calculated using Cronbach's alpha coefficient. The reliability was found to be high, with a value of 0.85 for the online health-related

behaviors section and 0.82 for the attitude section. The response options for this section ranged from 1 to 5, with 5 indicating "very high" and 1 indicating "very low." The maximum score for the online health-related behaviors section was 30, while the minimum score was 5. The maximum score for the attitude section was 10, and the minimum score was 2.

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### 2.3. Data Analysis

In this study, the researchers used various statistical methods and techniques to analyze the data. Frequency and percentage were used to describe qualitative variables, while mean and standard deviation were used to describe quantitative variables. Correlation and regression coefficients were used to investigate the relationships between variables. The data analysis was conducted using SPSS 19, a statistical software program. The researchers employed the Exhaustive chi-square automatic interaction detector (CHAID) technique, which is a decision tree method. This technique is based on binary recursive partitioning and is used to identify the factors that contribute to online health-related behaviors. The relationship between the explanatory and dependent variables is determined using IF-THEN logic and the chi-square test. The estimation of the exhaustive CHAID model starts with the entire sample as the "parent node" and then creates homogeneous subgroups called "child nodes." The criteria used to determine whether the model should be discontinued include a significance level for splitting nodes (set at  $p < 0.05$ ), the use of Pearson's chi-square test, a

specified model depth (set at 3 in this study), a minimum number of cases in parent nodes (set at 100), a minimum number of cases in child nodes (set at 50), and the use of cross-validation (10-folds) to assess the tree structure. Since the exhaustive CHAID model is unaffected by missing data and outliers, it was deemed suitable for analyzing the data in this study.

### 3. Findings

Responses from 406 participants were included in this study for analysis and evaluation. The participants' mean age was  $36.66 \pm 9.33$  years. Sixty-two percent of them were women, and 84 percent were married. Table 1 contains additional information.

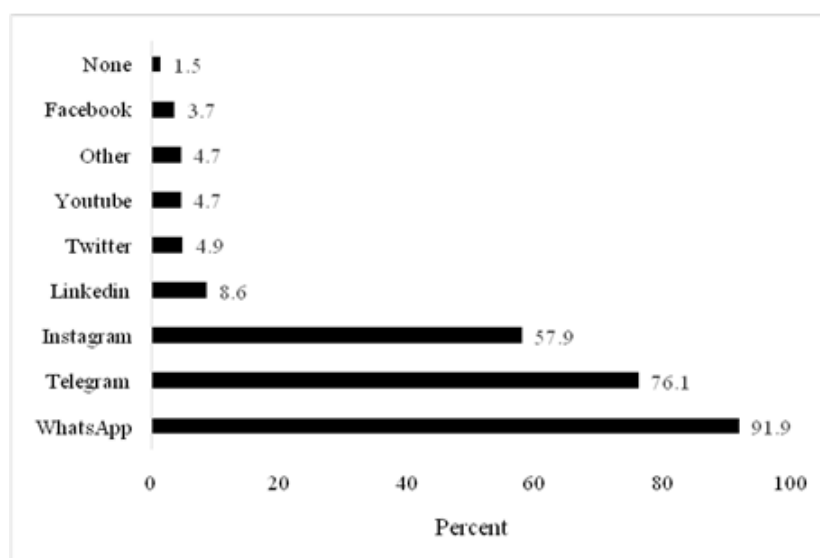
**Table 1**

*Demographic characteristics of the participants*

Variables		n	%
Gender	Male	151	37
	Female	255	62.8
Marital status	Single	58	14.3
	Married	340	84
	Other	7	1.7
Employment	Hired	275	71
	Annually contracted	112	29
Education	Diploma	85	21.3
	Bachelor/Master	186	46.6
	Master and MD	81	0.20
	PhD and clinical specialists	47	12.1
Job	Scientific Committee	340	85.4
	Non-faculty members	58	14.6
Income	<2 million	7	1.8
	2-3	32	8
	5-3	172	43.2
	>5	187	47
Age (year)	Mean (SD)	36.66	9.33
Number of children	Mean (SD)	1.46	1.28
Work experience (month)	Mean (SD)	123.35	111.48

**Figure 1**

*Percentage of membership in social media*



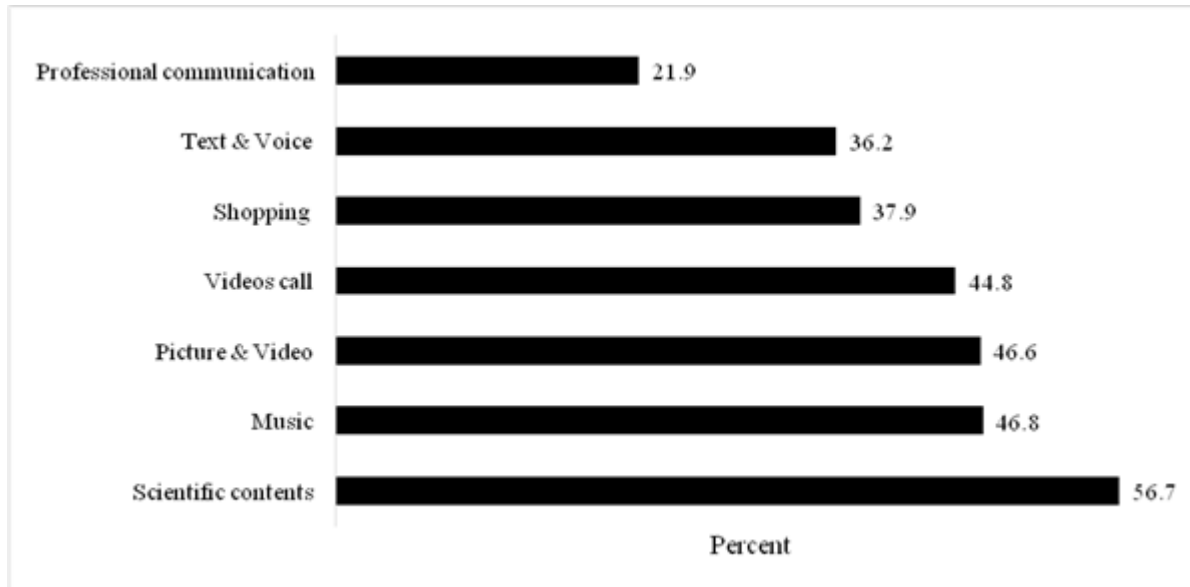
According to Figure 1, the social networks with the highest percentage of memberships were WhatsApp,

Telegram, and Instagram, respectively. Participants spent more time studying scientific contents than doing other

activities (Figure 2). Receiving and sending images, music, and video communications were nearly equal.

**Figure 2**

*Percentage of different activities of study participants in social networks*



Participants spent an average of  $28.44 \pm 21.5$  (Min = 0, MAX = 154) hours per week on social media. The average membership (number) in various media was  $3.27 \pm 1.6$ , and they communicated with their friends and relatives for  $12.18 \pm 7.76$  hours per day. Their mean score for social media attitude was  $7.18 \pm 1.92$ , and their score for online health-related behaviors was  $15.33 \pm 6.96$ .

Figure 3 shows the final 2-level model comprising seven nodes, four of which were terminal subgroups.

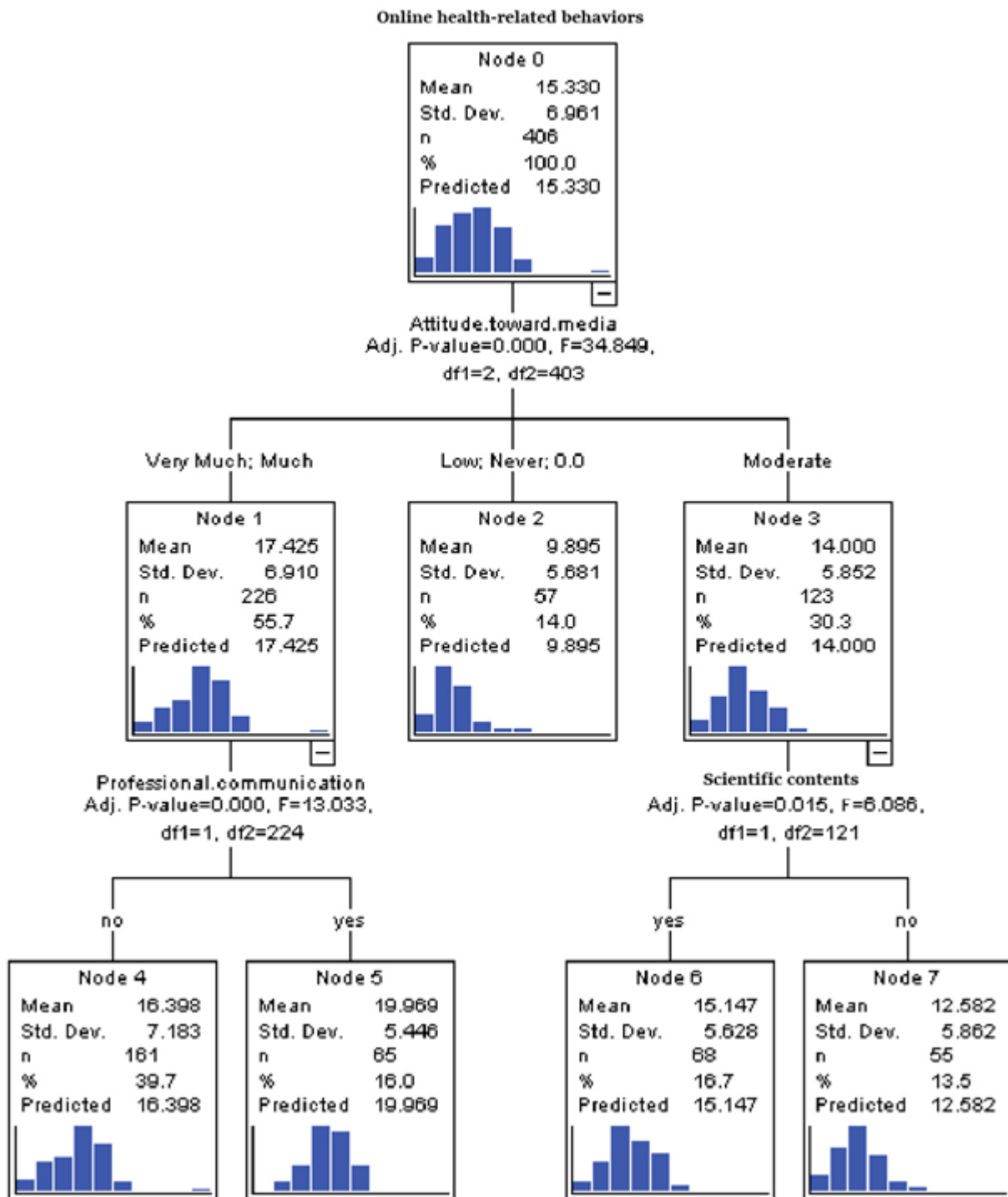
In Figure 3, the first level of tree is divided into primary branches based on attitudes toward online information. This variable is thus the best predictor of online health-related

behaviors. Participants who use the media to communicate with professionals (Node 5;  $19.97 \pm 5.44$ ) are included in the high-level or positive attitude group (Node 1). This rate reduces for people who did not interact with professionals (Node 4,  $16.39 \pm 7.18$ ), and those who had a negative attitude toward media information (Node 2;  $9.89 \pm 5.68$ ) had poor health-related behaviors.

Participants with moderate attitudes (Node 3,  $14 \pm 5.58$ ) who use media to study scientific content (Node 6;  $15.15 \pm 5.68$ ) were more likely to engage in online health-related behaviors during the COVID-19 epidemic. (Node 7,  $12.58 \pm 5.86$ ). Table 2 contains a list of these rules.

Figure 3

The classification tree of online health-related behaviors using the exhaustive chi-square automatic interaction detector (CHAID) method.



**Table 2**

*Mean estimations of each rule in decision tree*

Classification	Node	IF	THEN
1	4	Attitude toward media OR Attitude toward media = 2 AND Attitude toward media = 3 AND Attitude toward media= 1 AND Attitude toward media=0 AND Professional communication OR Professional communication=1	16.39
2	5	Attitude toward media OR Attitude toward media= 2 AND Attitude toward media=3 AND Attitude toward media=1 AND Attitude toward media=0 AND Professional communication=1	19.96
3	2	Attitude toward media= 2 OR Attitude toward media= 1 OR Attitude toward media=0	9.89
4	6	VALUE(Attitude toward media= 3 AND Scientific contents OR Scientific contents= 0	15.14
5	7	Attitude toward media= 3 AND Scientific contents =0	12.58

#### 4. Discussion

This study aimed to examine the determinants of online health-related behaviors among healthcare workers during the COVID-19 epidemic. The study was conducted approximately 10 months after the outbreak of COVID-19, allowing for a comprehensive understanding of the participants' experiences and behaviors during the pandemic. The results of the study indicated that healthcare workers extensively used various media platforms during the COVID-19 epidemic. However, their primary motivation for using these platforms was to seek health-related information. This suggests that healthcare workers recognized the importance of staying informed and updated on the latest developments and guidelines related to the pandemic. The study revealed that the attitudes of healthcare workers towards the quality of social media during the epidemic played a crucial role in shaping their online health-related behaviors. Specifically, their satisfaction with media platforms depended on the reliability, usefulness, and effectiveness of the information provided. This highlights the importance of having access to accurate and trustworthy information to effectively address the challenges posed by the coronavirus epidemic. Overall, this study emphasizes the significance of media literacy and the critical evaluation of information sources during times of crisis. Both healthcare workers and the general public should be equipped with the necessary skills to distinguish reliable and accurate information from misinformation or disinformation. This can contribute to making informed decisions and promoting positive health-related behaviors during epidemics or other public health emergencies.

The study found that individuals who communicated with professionals online had a more accurate understanding of the role of media during the epidemic. They recognized the importance of seeking accurate information, ensuring protective measures, and receiving

social support. Trusting professionals and obtaining reliable and useful information from them helped to correct misconceptions and refute false news and rumors, thereby reducing anxiety and worry (8). Previous research has also shown that professional information plays a crucial role in shaping people's perceptions and beliefs. This highlights the effectiveness and significance of relying on professionals for accurate information during times of crisis (19). As a result, users' satisfaction and positive attitude have increased due to the reduced time spent on receiving and processing information that is specifically tailored to their individual needs (20). On the other hand, relying on expert individuals as trusted resources can help alleviate irrational fears and anxiety (9, 10). Previous studies have supported this conclusion, as they found that users who found the information provided to be relevant to their preferences gave higher ratings to news portals compared to those who did not (21).

In comparison to the first group, those seeking access to scientific content were less satisfied (moderate attitude towards media). Given that, user's satisfaction with the utility and value of technology is affected by a variety of factors such as system quality, services received, and information content (22), high exposure to systemic complexity or the variety of different services and platforms, as well as reception of different information, can have a negative impact on cognitive assessment and perception. Excessive use of social media across multiple platforms increases the likelihood of encountering complex processes and ambiguous or contradictory information, which can result in cognitive or emotional fatigue and an inability to process information. Therefore, these people's attitudes and satisfaction with media (usefulness and reliability of information) were lower than in the first group (23). According to research and evidence, the onset of cognitive and emotional fatigue may result in the gradual abandonment of interactive behaviors and a lack of engagement in social networks (23, 24). There are several

limitations in this study. Firstly, it was cross-sectional and restricted to a specific population. As the data was gathered from healthcare workers in this province, other occupations were not included in this study. Its results, however, may be helpful for healthcare workers in other communities with similar cultural and social backgrounds. On the other hand, the current study wouldn't consider the majority of the background information about participants' behaviors.

## 5. Conclusion

The current study examined the factors related to online health-related behaviors among health care workers in a limited resource context using uses & gratification and self-determination theories. The study's findings indicate that the type of attitude or cognitive evaluation (reliability and usefulness of information) and motivation to use media or communication sources play an essential role in predicting individuals' behaviors. In other words, trustworthy resources, positive perception, and helpful information in response to individual needs can help maintain online health-related behaviors and effective communication among healthcare workers. These two characteristics can increase people's social capital and instill a sense of self-efficacy and reduce anxiety in insecure and unpredictable situations.

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## Transparency Statement

The authors are willing to share their data, analytics methods, and study materials with other researchers. The material will be available upon reasonable request.

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## Authors' Contributions

F.S: designed the study and wrote the manuscript, M.M designed the study and wrote the manuscript, M.M contributed to project administration and data curation.

## Declaration of Interest

The authors report no conflict of interest.

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## Ethics Considerations

The current study was reviewed and approved by the Review Board in Birjand University of Medical Sciences (ethical code: IR.BUMS.REC.1399.210) and informed written consent was obtained from all participants.



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