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Identifying factors affecting a healthy lifestyle in the post-COVID-19 era

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Abstract:

BACKGROUND: A healthy lifestyle is one of the important global concepts in the post-COVID-19 era, which can lead to maintaining and improving the health of societies. This study aimed to identify the factors affecting a healthy lifestyle in the post-COVID-19 era.

MATERIALS AND METHODS: The current research is a qualitative study that was conducted in the field by theoretical sampling method. The qualitative method used in the current research was Strauss–Corbin’s method. The data collection tool in the current research was a semi-structured interview. The researcher reached theoretical saturation by the end of the 13th interview, and for more certainty, the interviews continued until the 15th interview. The statistical population of the research was all professors and experts with specialized doctorate degrees in Mashhad University of Medical Sciences, and finally, 15 people were selected according to the entry and exit criteria for the study. Data analysis was done by summarizing and coding and analyzing the hidden content from expert interviews using MAXQDA software.

RESULTS: The factors affecting a healthy lifestyle in the post-COVID-19 era (cultural norms, social norms, biological norms, technological factors, and economic factors) emerged from the intuitive opinions of experts.

CONCLUSION: Providing and maintaining health is not a simple task, as it involves biological, individual, familial, cultural, societal, economic, political, and health factors. Promotion of healthy lifestyles is not merely the responsibility of health-related organizations and bodies; rather, they necessitate extensive coordination and empathy among educational, health, cultural, service, and even political institutions and bodies.

Keywords:

COVID-19, effective factors, healthy lifestyle, health system, post-COVID-19 era

Introduction

A healthy lifestyle is a known factor in preventing disease, decreasing mortality, and improving the overall health of a population. A healthy lifestyle ensures, maintains, and enhances the health and well-being of individuals. According to another definition, a healthy lifestyle is a way of life that reduces the risk of severe illness or early mortality and enables individuals to enjoy more aspects of life.^[1,2]

A sudden disease outbreak is always regarded as a grave threat to the mental

health of those infected and those in close contact with it. This can result in anxiety, depression, and anger in diagnosed patients, suspected patients, therapists, treatment groups, and those in close contact with patients.^[3,4] During the first wave of this epidemic, several lifestyle habits appeared to shift.^[5] The coronavirus crisis is an emergency that has created a dangerous and unstable situation for societies, necessitating innovative and fundamental measures to combat it. In the post-coronavirus era, the lifestyles of many age groups have changed; the changes that occurred in the new post-coronavirus era have caused people to adopt new lifestyles.^[6,7]

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The World Health Organization has classified this disease as a major threat to physical and mental health, as the spread of COVID-19 has altered the normal and daily lives of families and affected their lifestyles.^[8,9]

Invisibility, universality, unknownness, democracy, and complexity are a few of the varied effects of the coronavirus disease. The coronavirus crisis is an emergency that has created a dangerous and unstable situation for societies, necessitating new and fundamental measures to combat it.^[10,11]

Since the spread of the coronavirus, the lifestyles of people of all ages have changed. Consequently, engaging in health-promoting behaviors is one of the means by which individuals can maintain and control their health. A healthy lifestyle is a valuable resource for promoting health, coping with stressors, and enhancing life quality. Scientific evidence indicates that people's choices and lifestyle patterns impact health in the post-coronavirus era.^[12,13]

The importance of "lifestyle" on the health of people in society has caused many researchers to address this issue and theorize about it. The COVID-19 epidemic is a worldwide health crisis, making its prevention and treatment a top priority as it has impaired healthy lifestyles. It is crucial to understand the impact of this disease on lifestyle changes. Previous studies have examined lifestyle changes during the coronavirus pandemic over a relatively short time frame, and none have identified factors affecting a healthy lifestyle in the post-COVID-19. In light of the importance of a healthy lifestyle post-COVID-19 era and the importance of knowing the managers and healthcare policymakers about factors affecting a healthy lifestyle in the post-COVID-19 era, the present study as an innovation was designed and conducted to identify the factors affecting a healthy lifestyle in the post-COVID-19 era.

Materials and Methods

Study design and setting

A qualitative research study employing the grounded theory method was used to conduct the current study in 2022. Qualitative research intends to collect subjective data. The purpose of this study was to present a post-COVID-19 healthy lifestyle model in the Iranian healthcare system. The steps of conducting a grounded theory can be organized into four primary steps:

Question research

At this stage, the questions are semi-structured, which was done according to the literature background, participation, and guidance of professors and experts in this field. The main question in this research was:

- What are the factors affecting a healthy lifestyle in the post-COVID-19 era in the Iranian health system?

Study participants and sampling

Lifestyle experts were sampled purposively such that they could provide a wealth of data on the research topic. The statistical population consisted of all professors and experts with a specialized doctorate affiliated with Mashhad University of Medical Sciences, of whom 15 eligible individuals were recruited. In the current study, participants were selected depending on their knowledge and experience in sociology, psychology, medicine, management, and epidemiology as far as related to the research topic. The primary selection criteria were consent to participate in the study, a specialized doctorate, at least five years of work experience in their specialized field, expertise in psychology, medicine, sociology, and epidemiology, and experience in scientific or practical activities.

Ethics consideration

In terms of ethical considerations, the present study was ethical in two respects: First, all the participants volunteered to participate in the study, and secondly, considering the principles of confidentiality and secrecy, participants were assured that all information would remain confidential and that the results would be reported in a general manner. All procedures performed in study involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1975 Helsinki declaration and its later amendments or comparable ethical standards. This study was approved by the Biomedical Research Ethics Committee of Tehran Islamic Azad University of Medical Sciences which issued the study's code of ethics (IR.IAU.TMU.REC.1400.186.).

Data collection tools and technique

Face-to-face, semi-structured interviews served as the data collection instrument. The responses of the thirteenth interviewee and beyond were similar to those of the previous interviewees. In addition, nothing was added to the findings, and the interview data reached saturation. However, the interview was extended to 15 individuals for further certainty, although no new categories emerged from the last two interviews. In the current study, interviews were coordinated beforehand and conducted with the interviewer's presence at the interviewee's workplace. The interview lasted between 45 and 60 minutes over two business days. The categories in this study corresponded to the findings extracted from the participants' interview responses.

Data analysis

MAXQDA version 2020 was used for data analysis. After the interviews were completed, the data were carefully

reviewed, entered into a table containing the interviewee’s code and statements, and open codes were extracted. The codes were then reviewed, merged into major categories, and arranged in a table based on open and axial coding content. One hundred and thirty-six concepts (open code) were identified at this stage. To assess the data’s dependability and credibility (trustworthiness), measures such as participant evaluation and review by non-participants (supervising and advising professors) were implemented.

Results

This study was designed and conducted to identify the factors affecting a healthy lifestyle in the post-COVID-19 era in the Iranian health system. This research conducted semi-structured interviews with 15 experts who met the inclusion criteria. The demographic characteristics of the participants are given in Table 1.

Participants were selected purposively, and interviews were conducted until data saturation was reached. A total of 45 initial codes, five core categories, eight first-order subcategories, and two second-order subcategories were extracted using the grounded theory approach and were used to identify the factors affecting a healthy lifestyle in the post-COVID-19 era in the Iranian health system.

According to the intuitive opinions of experts, the present research revealed that the factors of a post-COVID-19 healthy lifestyle include cultural norms, social norms, biological norms, technological factors, and economic factors. In this section, some quotes from the interviewees are used to illustrate how the codes and categories are created.

Regarding this, the second interviewee stated: *“A healthy lifestyle, especially in the post-COVID-19 era, involves various factors, including psychological, social, and spiritual, among others. In order to have a healthy and cheerful life, it is necessary to pay special attention to mental health in addition to physical health so as to approach having a healthy lifestyle. Indeed, a healthy lifestyle in any society is closely related to the culture of that society. A post-COVID-19 healthy lifestyle is a preventive lifestyle. A culture whose output is not healthy food cannot have good resilience in times of crisis, and after the crisis, more time is needed to return to the normal situation and correct the previous problems.”* Also, in this regard, the seventh interviewee admitted that *“Among the cultural factors affecting a healthy lifestyle in the post-COVID-19 period are expanding the participation of academics in promoting cultural and social interactions in the university environment, changing the cultural and social environment of universities, and forming a think tank to facilitate a healthy lifestyle in the post-COVID-19 period. Among other effective factors are the way of production, consumption, commodity relations of humans, and the social*

Table 1: Demographic characteristics of the participants

Variable	Frequency	Percentage	Percentage (valid)
Gender			
Man	11	73.33	73.33
Woman	4	26.67	26.67
Total (valid)	15	100.00	100.00
Missing	0	0.00	-
Total	15	100.00	-
Tenure			
5–10	2	13.33	13.33
10–15	4	26.67	26.67
15–20	5	33.33	33.33
20–25	2	13.33	13.33
25–30	2	13.33	13.33
Total (valid)	15	100.00	100.00
Missing	0	0.00	-
Total	15	100.00	-
Marital status			
Married	14	93.33	93.33
Single	1	6.67	6.67
Total (valid)	15	100.00	100.00
Missing	0	0.00	-
Total	15	100.00	-
Age			
35–40	3	20.00	20.00
40–45	3	20.00	20.00
45–50	7	46.67	46.67
>50	2	13.33	13.33
Total (valid)	15	100.00	100.00
Missing	0	0.00	-
Total	15	100.00	-
Education level			
Doctorate	15	100.00	100.00
Total (valid)	15	100.00	100.00
Missing	0	0.00	-
Total	15	100.00	-

role of goods and services with society, which will undergo big changes in meaning and concept. The institution of the family has undergone transformations after COVID-19; the family is a sacred and safe institution for people, but this definition has faced a little change. In the post-COVID-19 society, the concept and cohesion within the family must be revised, and the concept of family solidarity must be redefined.”

Tables 2 and 3 present parts of the open, axial, and selective coding processes.

Following consultation with the supervising and advising professors, the initial codes, subcategories, main categories, and axial codes were extracted. Figures 1 and 2 illustrate how the researcher used a triangulation approach to create five main categories, eight first-order subcategories, and two second-order subcategories based on engagement with the research, research literature, and expert opinion.

Table 2: Initial coding sample from the interview texts

The text of the interview	Initial code
<p>The post-COVID-19 era has ushered in a new way of life. The public’s disposition has shifted. There are numerous individuals who suffer from stress due to the loss of family and friends. Because of the decrease in business activities prompted by the coronavirus outbreak and the rise in unemployment, the income and well-being of a great number of families have been negatively impacted. Anxiety and depressive symptoms have increased among children, adolescents, and adults. Therefore, in the era of COVID-19, people’s lifestyles have become more health-conscious than they were in the past. It must be a mentally healthy way of life, one that prioritizes mental health.</p>	The period of growth and excellence after stress
<p>This lifestyle is linked with hygiene, which includes concepts such as disinfection, compliance, care, distance, and frequent hand washing. During this time, individuals should cultivate the concept of endurance and work to establish it in their personalities. In the face of adversity, a person should be able to maintain his psychological health. A person must have a high threshold for any unexpected event. This acceptance enables the individual to be adaptable and replace his life goals based on the current circumstances. Acceptance, adaptability, and resiliency are, therefore, essential components of the post-COVID-19 lifestyle.</p>	Crisis management
<p>In the post-COVID-19 era, people live a healthy or unhealthy lifestyle based on the interaction of environmental factors, their aptitude, and their social adaptability. Unhealthy habits expose an individual to physical and mental dangers. Therefore, it is only natural that we pursue a healthy lifestyle. Choosing a healthy lifestyle also depends on a number of other factors, the most significant of which are individual skills and qualifications, stress and anxiety, culture, individual–society relationships, and a sense of life control.</p>	Purchase of health-related products
<p>The World Health Organization defines a healthy life as a state in which an individual is physically, mentally, and socially healthy. In other words, the true definition of a healthy life is all the actions, steps, and activities humans engage in to achieve physical and mental health. Consequently, it can be stated that the primary outcome of a healthy lifestyle, particularly in the post-COVID-19 era, is the physical, mental, and social health of individuals so that a relative certainty of the correctness of the processes is attained. Coronavirus negatively impacted the lives of nearly everyone. In the post-COVID-19 era, a healthy lifestyle mitigates many of the negative effects on people’s lives, which some individuals turned into an opportunity.</p>	Engagement of academics in promoting cultural interactions Individual skills and competence The culture of aiding and educating citizens Relationships between people in society Increased digital behaviors Filling leisure time and entertainment with various virtual space tools Organization of administrative meetings in the virtual space Distance education in scientific and educational centers Telephone and online health-oriented consultations Government action to attract foreign investment

Table 3: Summary of axial codes and categories

Identifier	Core category	Axial code	Indicator
AA1	Cultural norms	Factors affecting a healthy lifestyle in the post-COVID-19 era	A
AA2	Social norms		
AA3	Biological norms		
AA4	Technological factors		
AA5	Economic factors		

The factors influencing a healthy lifestyle in the post-coronavirus era based on the intuitive opinions of experts were determined, including cultural norms, social norms, biological norms, technological factors, and economic factors.

Discussion

The results unveiled the factors contributing to healthy lifestyles in the post-coronavirus era, including cultural norms, social norms, biological norms, technological factors, and economic factors.

The first factor affecting a healthy lifestyle in the post-coronavirus era is cultural norms, which include smart cultural norms and the prejudice and pursuit of modern lifestyles. In line with this finding, Smirmaul *et al.* (2021)^[14] examined lifestyles during (and after) the COVID-19 pandemic and found that the pandemic made it difficult for individuals

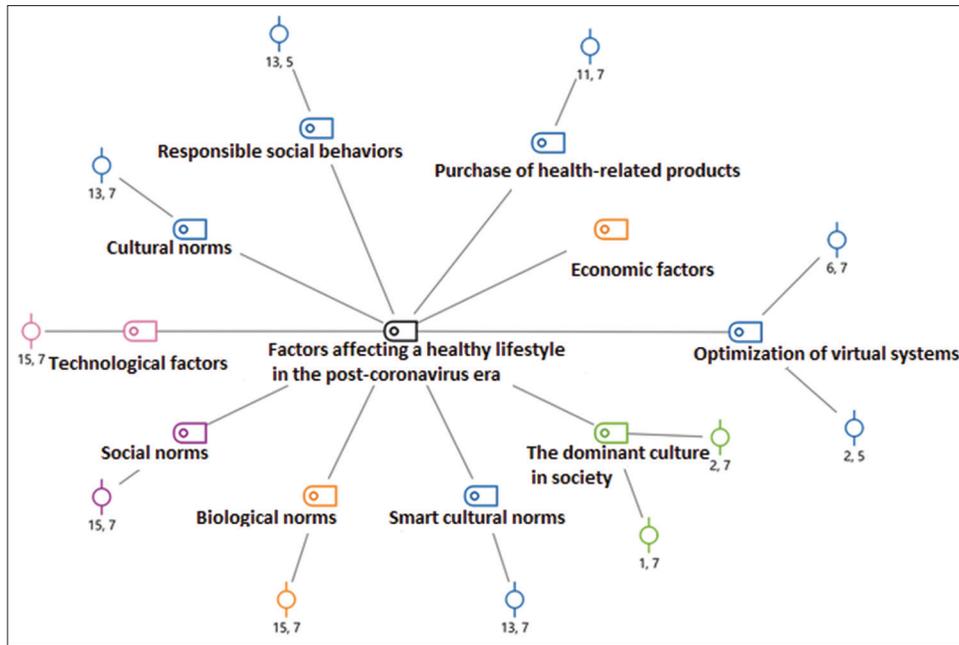


Figure 1: Tree diagram of initial codes, categories, subcategories, and axial code (factors affecting a healthy lifestyle in the post-coronavirus era)

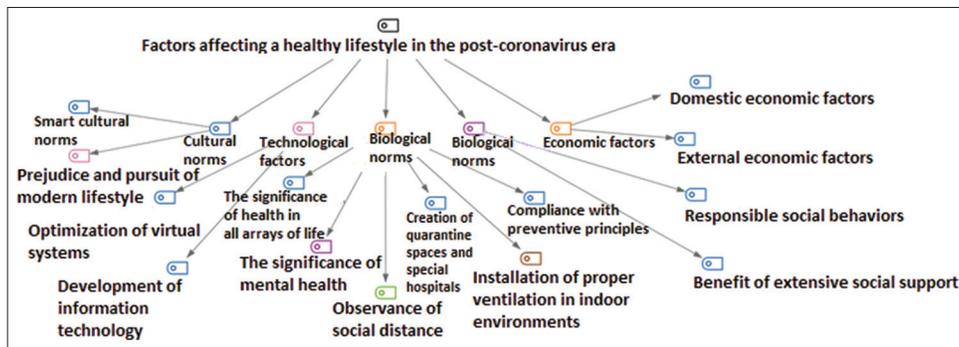


Figure 2: Hierarchical model diagram of initial codes, subcategories, categories, and axial code (factors affecting a healthy lifestyle in the post-coronavirus era)

and families to maintain a healthy lifestyle, quality of life, and well-being. Early evidence suggests that unhealthy lifestyle behaviors are closely related to increased mortality risk and severity of COVID-19. To help this challenging global situation, they included a group of lifestyle-focused researchers and physicians to provide credible scientific information, recommendations, and resources regarding the fundamentals of a healthy lifestyle. Their research revealed that physical activity, sleep, non-use of tobacco/alcohol, stress management, relationships, and health form a planet of effective patterns surrounding a healthy lifestyle.

Similarly, Tajbakhsh (2020) examined the post-coronavirus lifestyle in his qualitative study. After analyzing the qualitative data, he identified six major lifestyle themes in the post-coronavirus era: health-oriented, family-oriented, media-oriented, community-oriented, culture-oriented, and leisure-oriented.^[6]

According to the findings of this study, social norms, namely, the benefit of extensive social support and responsible social behaviors, constitute the second most important factor influencing a healthy lifestyle in the post-coronavirus era.

In keeping with this finding, Beiraghifard and Kargar (2019) examined the role of lifestyle in health and the prevention of coronavirus disease. According to their findings, people are compelled to alter their lifestyles in the light of new scientific findings. In the conflict between popular knowledge and scientific knowledge, individuals should accept scientific findings and abandon certain social practices.^[15] Likewise, Erdoğan et al. (2021)^[16] investigated the healthy lifestyle habits of teachers during the COVID-19 period. According to the results of their study, the COVID-19 pandemic has caused a decline in physical activity, a disregard for a healthy diet, and weight gain among teachers. During the coronavirus pandemic, the quality of life can be

improved by informing people about healthy eating and increasing physical activity.

According to the current study, biological norms make up the third factor affecting a healthy lifestyle in the post-coronavirus era. They include the creation of quarantine spaces and special hospitals, the significance of health in all arrays of people's lives, the significance of mental health, observance of social distance, compliance with preventive principles, installation of proper ventilation in indoor environments, respect for nature, the importance of healthy lifestyle, presence in open spaces, and attention to healthy nutrition and boosting the immune system.

In line with the current study's findings, Ettehad *et al.* (2021)^[8] investigated changes in urban lifestyles during crises with a focus on COVID-19. They noticed that the coronavirus pandemic had led to changes to the urban way of life, ultimately resulting in the emergence of new needs in the post-coronavirus era. In addition to bringing problems and threats, they argue the pandemic would also create opportunities. Therefore, it would be possible to provide appropriate models and programs for a healthy lifestyle by identifying the needs of urban life in the post-coronavirus era, as well as the threats and opportunities resulting from this epidemic.

The findings of Gabriel *et al.*^[17] (2021) are also consistent with this finding of the present study. They examined the correlation between healthy lifestyle habits and COVID-19-protective behaviors in their study. Greater engagement in healthy lifestyle behaviors before the onset of the epidemic was significantly associated with greater adherence to coronavirus protective behaviors. Likewise, Laksono *et al.*^[18] (2020) investigated the predictors of a healthy lifestyle during the COVID-19 epidemic in Indonesia. Their study revealed that age, occupation, the use of masks, and adherence to personal hygiene are indicators of a healthy lifestyle during the coronavirus pandemic.

According to the findings of this study, the fourth factor influencing a healthy lifestyle in the post-coronavirus era is technological factors, including the development of information technology and the optimization of virtual systems.

In keeping with this finding, Eskandarian (2020) investigated the lifestyle-associated effects of the coronavirus (with an emphasis on the cultural consumption pattern). The findings revealed that the coronavirus crisis and quarantine conditions had both positive and negative effects on the cultural consumption pattern of Iranian families. The coronavirus crisis and subsequent conditions have led to a significant

strengthening of visual and audio consumption patterns as regards the consumption of cultural goods. As far as cultural activities are concerned, activities based on outdoor relationships have been placed in the spotlight as an opportunity for interaction and conversation with family members. However, this opportunity has also presented significant risks. With the emergence of numerous capabilities, the virtual consumption pattern has carved out a unique niche in the cultural consumption basket.^[19]

Along similar lines, Moradi and Mohammadifar (2020) investigated the role of social networks in the formation of social fear and lifestyle changes caused by the coronavirus. According to the study, social networks significantly impact the development of social phobia, but there is no correlation with lifestyle change. Additionally, internal social networks have significant and negative effects on the development of social phobia and lifestyle changes. To form rational and desirable behaviors as opposed to dramatic ones such as social anxiety in the context of using social networks, social workers should prioritize organizing information and educating the community.^[20]

Our research revealed that (external and domestic) economic factors constitute the fifth category of factors influencing a healthy lifestyle in the post-coronavirus era. The interaction of a person's personal characteristics, social interactions, and environmental and socioeconomic living conditions affects a person's lifestyle, which is characterized by distinct behavioral patterns. Therefore, it can be stated that economic, social, and environmental issues influence people's behavioral patterns and lifestyles.

The findings of this study indicated that the government's action to attract international investment, use of successful economic models from around the world, attention and adherence to the resistance economy, the transformation of traditional jobs with the introduction of new technology, expansion of the domestic economy, the transmission of costs to health issues, reduction of unnecessary costs of ceremonies, the development of virtual businesses, and the encouragement of businesses to flourish are among the economic measures that affect a healthy lifestyle in the post-coronavirus era. Therefore, to optimize the economy of the family and society, policymakers must prioritize community-level programs that can improve economic welfare and reduce healthcare expenses.

In line with this finding, Ghasemi *et al.* (2009)'s^[21] study titled "The role of social media in the formation of social phobia and lifestyle changes caused by the coronavirus" demonstrated that economic, social, and cultural capital

influences the dimensions of a health-oriented lifestyle. They argue that increasing individuals' social, economic, and cultural capital makes their lifestyles healthier.

This finding of the present study is consistent with Afshar *et al.* (2016)'s^[22] findings. In their study titled "Mass media, socio-economic situation audience, and agenda-setting the knowledge related to a healthy lifestyle," they demonstrated that socioeconomically diverse citizens differ in their use of mass communication tools and their perceived need for advice in health-related behavior. Indeed, those with a higher socioeconomic status reckon a greater need for health-related behavior advice. Likewise, their media consumption is greater. These differences result in differences in the ability to benefit from health-oriented lifestyle knowledge. As such, socioeconomically privileged individuals are more knowledgeable about health-oriented lifestyle choices.

Limitations and recommendation

Among the limitations of the current research are the reluctance of some experts to participate in interviews and answer questions in person, the difficulty of gaining access to experts due to the pandemic, job responsibilities, occupational concerns, and distance. Although qualitative research appears to have yielded the most relevant results in relation to the current study topic, the evaluation of these results' precision is limited. Consequently, care must be taken when generalizing findings.

Conclusion

The research results reveal that the factors affecting a healthy lifestyle in the post-coronavirus era include five main categories as well as eight first-order and two second-order subcategories. In the current research, cultural norms, social norms, biological norms, technological factors, and economic factors emerged as the factors affecting healthy lifestyles in the post-coronavirus era based on the intuitive opinions of experts.

As was discussed, providing and maintaining health is not a simple task, as it involves biological, individual, familial, cultural, societal, economic, political, and health factors. Realization of appropriate health platforms, prevention of chronic diseases, and promotion of healthy lifestyles among citizens are not merely the responsibility of health-related organizations and bodies; rather, they necessitate extensive coordination and empathy among educational, health, cultural, service, and even political institutions and bodies. On this basis, the following operational solutions are presented to health sector trustees and policymakers:

- Preparing the environment and society to have vitality and happy lives with an active and constructive spirit
- and providing solutions to increase positive feelings and optimistic thoughts among the people are all important steps toward achieving a vibrant spirit in society after COVID-19. It is suggested that virtual spaces and the media have cheerful and entertaining programs to boost the morale of the public and direct their feelings and emotions toward positive thinking.
- It is important to provide foundations for structural and social smartening of society, such as following health news and information from credible sources, providing services online, and smartening the city's information field. It is proposed that the quality of access to trustworthy health news be improved by optimizing the use of smart, digital, and electronic personnel, resources, and facilities, as well as by improving news reporting-related communication.
- Concerning social capital, it is recommended that certain contexts be prepared for promoting social capital to create a new pattern of life and social solidarity, to strengthen the family foundations and a stable and peaceful life in the family, to institutionalize empathy among people, and to fill social and cultural gaps after the coronavirus epidemic. It is suggested, for instance, that educational and cultural programs aimed at strengthening family relationships and fostering a greater sense of empathy and solidarity in society receive greater prominence in the media.
- To optimize the economy of the family and the community, it is recommended that authorities develop plans to improve economic wellness and reduce healthcare costs, which will solve several family problems caused by economic issues. Many companies suffered setbacks during the COVID-19 pandemic, and families have had to shoulder the associated expenses. The government should assist in improving the economy of families and society by fostering the growth of new businesses. The government should take the necessary steps to lure foreign investment, enhance traditional businesses with new technology, expand the domestic economy, reduce unnecessary event costs, and develop and enhance virtual businesses.
- It is also important to have a fair distribution of public health resources among citizens, particularly during epidemics, and implementation of social justice programs to empower disadvantaged and vulnerable segments of society. Establishing health centers in impoverished areas, distributing sanitary supplies, and directing personal and public health education in such areas are all beneficial measures.
- It is recommended that the government provides grounds for strengthening the religious spirit of people and society to follow a healthy lifestyle to maintain their own and others' health. Moreover, it is suggested that strategies be adopted to solve

psychological problems and the psychological effects of the conflict brought on by the coronavirus epidemic for the elderly and those with mental illness.

Ethics approval and consent to participate

In terms of ethical considerations, the present study was ethical in two respects: first, all the participants volunteered to participate in the study, and secondly, considering the principles of confidentiality and secrecy, participants were assured that all information would remain confidential and that the results would be reported in a general manner. All procedures performed in study involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1975 Helsinki declaration and its later amendments or comparable ethical standards. This study was approved by the Biomedical Research Ethics Committee of Tehran Islamic Azad University of Medical Sciences issued the study's code of ethics (IR.IAU.TMU.REC.1400.186.).

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Conflicts of interest

There are no conflicts of interest.

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