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Original

Designing a Tool for Measuring Preventive Behaviors Against Coronavirus (PBAC) in Lifestyle and Home-based Jobs of Iranian

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ABSTRACT

Background: The outbreak of coronavirus is a global crisis, which has caused many deaths and injuries around the world. Observing preventive behaviors of the general public is one of the main ways to break the chain of transmission, and get rid of this crisis. The aim of this study is to determine the extent of preventive measures regarding Coronavirus disease in the lifestyle and home-based jobs of Iranian society. **Methods**: In this validation, methodological study, after reviewing the opinions of experts, the authors collected questions to evaluate the extent of preventive behaviors against coronavirus (PBAC). Questions with a face validity index greater than 1.5, a Content Validity Index (CVI) index greater than 0.79, and a Content Validity Ratio (CVR) index greater than 0.62 were considered appropriate. If Cronbach's alpha coefficient was greater than 0.7, the internal reliability of the instrument was established. **Results**: The face validity of all questions was more than 1.5, and the face validity of all questions was confirmed. In the 5 questions, the CVI index was less than 0.79, and the CVR index was less than 0.62. After removing those 5 questions, the final questionnaire of 16 questions was introduced as a tool. Also, the internal reliability of the instrument was (α = 0.71). **Conclusion**: Results of this study demonstrated that the proposed questionnaire is suitable for measuring the level of preventive PBAC regarding the lifestyle and home-based businesses, and has good validity and reliability as a useable tool.

Keywords: Coronavirus; Prevention; Lifestyle; Covid-19

Introduction

In December 2019, a new infectious disease called coronavirus was announced in China by the World Health Organization (WHO).[1,2] This epidemic has had unprecedented global effects on people's daily activities and lifestyles.[3,4] The incubation period of the disease varies between 2 days to 14 days after exposure to the infected person. [5] Common symptoms of this disease include fever, cough, and shortness of breath.[6] Many countries implemented measures such as travel bans, quarantine

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in homes, social isolation, school closure, and isolation of infected populations, which severely disrupted many daily activities.[7,8] During this period, some home-based businesses became popular, and teleworking and working at home became an important priority in many communities.[9] Coronavirus is transmitted through direct contact with the respiratory secretions of an infected person and has a high transmission capacity. On average, an infected person can spread the disease to three other people. Due to the fact that this virus has a high rate of transmission, people's behaviors are important for controlling and preventing the disease.[10] A significant way to prevent the disease is to prevent exposure to the virus by performing preventive behaviors.[11]

The Centers for Disease Control and Prevention (CDC) recommends preventative behaviors such as hand washing, use of hand sanitizers and face masks, and social distance to reduce the risk of infection and the spread of the virus. [12] It is important for people to believe that health behaviors reduce their vulnerability to the condition or its severity.[13]

In this regard, it is necessary to assess individuals' beliefs about Coronavirus prevention and control, and their motivation for preventive behaviors such as personal hygiene, use of personal protective equipment (PPE), maintaining social distance and staying at home.[14] Individuals must also believe in the effects and benefits of preventive measures, and accept the fact that developing preventive behaviors will cost less.[15]

Therefore, the psychological and behavioral responses of people in society play an important role in preventing and controlling the spread of the virus.[14] Moreover, since individual characteristics, such as demographic variables (e.g., age, gender) and personality variables can also affect individuals' behavior, they should be taken into account as well.[13]

At the same time, there was no study about designing a researcher-made questionnaire to examine the extent of preventive behaviors in Iranian society regarding the home business approach. Therefore, the authors decided to design questions on demographic information and information on the awareness and behavior of individuals. In the case of Coronavirus, their sensitivity and preventive behaviors should be assessed so that educational interventions can be implemented with accurate knowledge of individual characteristics.

It is hoped that the results of this study will be used in planning for health promotion and improving Coronavirus preventive behaviors in the community and home-based jobs environments.

Methods

This study is part of a plan to investigate the level of preventive behaviors of people towards the perception of and concern for Coronavirus, in the city of Torbat Heydariyeh, in the spring of 2021, which is based on a validation methodology with a home-based jobs approach. Test items were performed using exploratory factor analysis.

First, questions related to preventive behaviors of people during the Coronavirus pandemic were designed with a library and field research, and also summarized and finalized by a group of experts from Torbat Heydariyeh University of Medical Sciences as a remote panel.

The finalized questions were later submitted by the top 10 experts, with at least 10 years of experience in the health system, including fields of occupational health (2 people), public health (4 people), environmental health (2 people), epidemiologist (1 faculty member), and biostatistics (1 faculty member).

Finally, this questionnaire consisted of 21 questions. After observations, each of the preventive behaviors was measured from very low to very high. Questions 1, 3, and 4 in Table 1 were categorized as yes, no and I do not know, and other questions with the likert scale were categorized from very low = 1, low = 2, medium = 3, high = 4, and very high = 5.

The appropriateness of the questions was assessed using face and content validity in qualitative and

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quantitative methods by 10 experts.

In determining the face validity qualitatively, appropriateness, ambiguity, and misconceptions were examined and corrected.

Regarding face validity, if the score of each question was more than 1.5, the designed question was appropriate. In a qualitative review of content validity, the researcher asks experts to provide the necessary feedback, after a qualitative review of the tool, based on the criteria of grammar, use of appropriate words, and placement of items in the appropriate place, according to which the items will be corrected.

To check the content validity in a quantitative way, two content validity ratios were used to check the necessity of the question, and the Content Validity Index was used to check the relevance of the question to the main topic.

If the Content Validity Index (CVI) score was above 0.79, the appropriate item was identified. The obtained Content Validity Ratio (CVR) value was also compared with Lawshe's (1975) table. For ten evaluators, a CVR value greater than 0.62 was appropriate.[16]

After confirming the face and content validity of the questionnaire, SPSS statistical software version 21 was used for exploratory analysis, obtaining subscales, and data analysis. To measure the adequacy of sampling and justifiability of factor assessment, Kaiser-Mayer-Olkin (KMO), and Bartlett Sphericity tests were used.

Data analyses were conducted with a confidence level of 95%. To describe the quantitative data, mean score, and SD was used, and to describe the qualitative ones, n (%) was used.

After performing formal and content validity steps, the questionnaire was given to 30 ordinary people. After answering the questions of the questionnaire, the internal reliability was calculated using Cronbach's alpha coefficient.

If Cronbach's alpha coefficient was greater than 0.7, the internal reliability of the instrument was established.

The designed questionnaire consisted of two parts:

1.demographic information (such as age, sex, marital status, education, occupation, and place of residence)

2.PBAC (such as using a mask in public places, observing social distance, washing hands, attending parties, etc.)

Ethical considerations

This study was approved by the ethical committee of Torbat Heydariyeh University of Medical Sciences with this cod number: IR.THUMS.REC.1400.007.

Results

After the initial design of the questions, a questionnaire was provided to 10 experts, to determine the face and content validity of qualitative and quantitative methods. Based on the results, the face validity in all questions was more than 1.5, and the face validity of all questions was confirmed.

CVI index values in questions 2 (having a contact number to report suspected cases of Coronavirus), 11 (avoiding contact with pets due to Coronavirus outbreak), 12(disinfecting the purchased goods and home), 13 (rate of surface disinfection in the past year), and 21 (considering fines for violators of the Coronavirus prevention guidelines) was less than 0.79.

In addition, the value of the CVR index in questions 2, 11, 13, and 21 was less than 0.62. Therefore, questions 2, 11, 13, and 21 were removed from the questionnaire due to the lack of content validity.

After removing the above questions, a questionnaire was given to 30 participants to evaluate the reliability. The internal reliability of the above instrument was obtained using Cronbach's alpha coefficient, which was equal to 0.71, and since the number obtained was greater than 0.70, the internal reliability of the present instrument was confirmed. Therefore, the 16-item questionnaire was considered the final questionnaire.

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Table 1. Face and Content Validity in a Quantitative Method

Row		Face validity	CVI	CVR	Question status
1	Do you think that someone with Coronavirus disease may not show or report symptoms?	3.40	0.80	0.80	Main
2	Do you know a contact number to report suspected cases of Coronavirus or questions about the disease?	3.10	0.60	0.20	Delete
3	Have you ever had Coronavirus disease and its symptoms?	3.20	0.80	0.80	Main
4	Has anyone around you ever been infected with Coronavirus?	3.30	0.80	0.80	Main
5	How often did you use shared personal stuff at home during this year?	3.50	0.80	0.80	Main
6	How much attention have you paid to personal hygiene (outside home) in the past year?	3.10	0.80	0.80	Main
7	How much have you gone in-person shopping in the past year?	3.50	0.80	0.80	Main
8	How many times have you visited banks and busy offices these days?	3.80	0.90	0.80	Main
9	How much have you been buying from the shopping center these days (one year)?	3.80	0.80	0.80	Main
10	Have you seen a doctor regarding the symptoms of Coronavirus in the last year?	3.40	0.80	0.80	Main
11	Has the outbreak of coronavirus caused you to avoid contact with pets?	3.00	0.50	0.20	Delete
12	How much did you disinfect the purchased goods and home, (in the past year)?	3.90	0.70	0.60	Delete
13	How much have you disinfected your home, clothes, and other items in the past year?	3.40	0.60	0.20	Delete
14	How much have you been to mosques and shrines or crowded places in the past year?	3.90	0.80	0.80	Main
15	Have you been visiting relatives, acquaintances, and parties during holidays?	4.10	0.90	0.80	Main
16	How often do you use masks and disinfectants outdoors?	4.10	0.80	0.80	Main
17	How much social distance (at least one and a half meters) do you observe with people?	4.30	1	1	Main
18	How committed are you to change your behavior in life during the Coronavirus outbreak?	3.80	0.79	0.80	Main
19	How much do you wash your hands properly and thoroughly during the day?	4.10	0.90	1	Main
20	How much of your personal belongings have you separated from others?	3.50	0.80	0.20	Main
21	In your opinion, are cash and non-cash fines effective for people who do not comply with safety and health standards, do not take home quarantine seriously, and are involved in the spread of the disease, the rate of death and mortality?	3.20	0.60	0	Delete

Discussion

The coronavirus has caused infection and death of millions of people worldwide due to its rapid spread.[17] Since no effective treatment for this disease has been found so far, the main way to reduce the rate of spread is to prevent transmission of the virus among people, by encouraging preventive behaviors and increasing awareness.[18,19] Various studies have been performed on preventive behaviors and psychosocial actions against Coronavirus, but there is no valid scientific tool to measure these behaviors in the general population.[18]

On the other hand, the study of PBAC in Iran is completely different from other countries, due to different and unique characteristics of the different people, cultures, and cities, as well as the common values and beliefs of Iranians.

Therefore, there is a need to conduct a study, in order to build a suitable tool, and in accordance with the standards of Iranian culture, to examine the preventive measures taken by people.

The results of the present study suggested that the use of a 16-item questionnaire including questions such as demographic information, coronavirus

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behavior in the community, and in personal life is a valid tool for measuring PBAC.

The obtained alpha coefficients also indicate the stability of the measuring tool regarding PBAC.

In this study, after reviewing the questions asked by experts, the face validity of all questions was more than 1.5, which was confirmed.

The value of the CVI index for the 5 questions of the questionnaire was less than 0.79. Furthermore, the value of the CVR index in these questions was less than 0.62. After removing the above questions, the final questionnaire of 16 questions was introduced as a measurement tool. Also, the internal reliability of the instrument (α = 0.71) was maintained. This questionnaire was designed with accurate knowledge of vulnerable areas and barriers, to preventive behaviors to open the way to perform appropriate interventions to improve health.

Since the virus can be transmitted through respiratory droplets of infected people, one of the preventive behaviors is the use of personal protective equipment such as wearing gloves and a mask.[20] Among preventive behaviors, most emphases were put on handwashing, but a study showed that only 5% of people wash their hands properly for more than 15 seconds.[21] A question with this content was included in the questionnaire. Another study demonstrated that there was a significant relationship between gender, age, marital status, education with preventive behaviors. As a result, men, younger and single people had less preventive behaviors than other people.[22] This, in turn, raises the importance of questions on the subject of demographic information.

In a study, Ma et.al found that people with lower levels of education were also less aware of the risks of the virus, and paid less attention to health care.[23] In one study, findings showed that people living in rural areas received lower scores regarding preventive behaviors against the Coronavirus.[24]

In the study by Mirzaei et al., it was reported that only 28.5% of patients had at least one of the symptoms (fever, cough, shortness of breath, headache, and fatigue), or had unprotected contact with suspected people who went to a physician. The rest of the people have either ignored the symptoms or treated themselves.[14] Therefore, this question was also designed with the aim of providing the necessary training regarding timely referral to a physician.

One of the strengths of the questionnaire was the comprehensiveness of the questions raised in all dimensions. It covered all the required items and information, which only took a little time to fill in.

Because filling out the questionnaire was online and required the Internet, the participation of people who did not have access was eliminated. Also, because most of the people using the Internet were young and middle-aged, it was expected that the elderly would participate less.

Conclusion

The results of this study showed that the tool designed to measure PBAC regarding lifestyle and home-based businesses is appropriate, and has good validity and reliability.

It also provides an opportunity to make effective educational interventions in future by accurately recognizing behavioral characteristics of individuals and recognizing their strengths and weaknesses. Interventions that not only improve less observed behaviors, but also reduce the incidence of the disease in society and the home-based jobs environments in Iran.

Conflict of interest

There is no conflict of interest declared.

Acknowledgment

This study is part of a plan to investigate the level of preventive behaviors of people towards the perception of and concern for Coronavirus disease in the city of Torbat Heydariyeh, in the spring of 2021.

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It is a validation, methodology research with a home-based jobs approach.

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Author's contribution

All authors equally contributed to preparing this article.

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