



Investigating public participation in adopting preventive health behaviors during COVID-19: a cross-sectional study in Urmia, Iran

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Abstract

Background & Aims: Observing public health protocols for COVID-19 has been documented as one of the key strategies to prevent the spread of this contagious condition and mitigate its impact. The present study investigated public participation in terms of adopting preventive health behaviors during this pandemic.

Materials & Methods: This descriptive cross-sectional study was performed in the city of Urmia, Iran, in 2020. Two statistical populations, viz., the general population and public places, were recruited. Employing the ratio estimate formula, the sample size of the general population was determined as 2,398 individuals. Additionally, eight public places were selected from the 30 neighborhoods in the city of Urmia, via convenience sampling. The data collection tool was a researcher-made 47-item questionnaire, whose face and content validity and reliability were confirmed. The questionnaire was then completed upon visiting the selected public places in person by naturalistic concealed observation. The data were finally analyzed using the SPSS Statistics-16, with descriptive statistics.

Results: Face mask use was at a good level in seven public places, except for restaurants and diners. Also, social distancing practices were at a moderate level in bakeries, electronic government services offices, beauty salons, public transport vehicles, and banks.

Conclusion: Based on the results, there is a dire need to strengthen and maintain public participation by paving the ground through running advertising campaigns, designing and implementing educational interventions for various trade guilds and jobs, conducting advisory activities, and exploiting social media to inform and train the general population.

Keywords: COVID-19, Public Participation, Protocols, Prevention

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Introduction

Coronaviruses are considered a large family of viruses that cause illnesses, particularly respiratory

tract infections. The coronavirus disease 2019 (COVID-19) is the most recent member of this family (1, 2) and it has been spreading more rapidly than ever

across the world. Being one of the most common health issues, it has been declared a pandemic by the World Health Organization (WHO) (3, 4). Approximately 800 million individuals have been globally diagnosed with this condition, and over 6.7 million deaths have been reported as of February 27, 2023. The mortality rate up to this date in Iran has been correspondingly more than 144 thousand people, and the number of confirmed cases has been higher than 7.5 million (5).

Even though the novelty of COVID-19 has made its prevention full of twists and turns, raising awareness, getting vaccinated, and adopting preventive health behaviors (PHBs) have been thus far acknowledged among the key strategies to mitigate the spread of the disease (6). In this context, the WHO has further released public health protocols that must be implemented to control and prevent this pandemic. Most countries have additionally taken some minimal measures at the national level, among other things (7, 8), such as formulating and publicizing some public health protocols at the community level and public places to prevent the disease transmission, e.g., observing hand hygiene through washing with soap and water or using other disinfectant products, avoiding handshakes, not hugging and kissing, disinfecting groceries, cars, and home environment, wearing face masks and gloves in public places, maintaining social distancing, suspending educational activities in classrooms, practicing home quarantine, closing borders, as well as restricting intercity and international travels (9, 10).

For that reason, PHBs can play a crucial role in avoiding this infectious disease (11), as the way people behave in social settings is likely to contribute to the virus transmission and persistence in the environment (6, 12). Of note, there have been fluctuations in the statistics of the confirmed cases and deaths since the outbreak of COVID-19 in Iran. For the meantime, the impact of any changes in people's behavior on such statistics should be taken into consideration in this domain. During mass gatherings when public health protocols are not strictly followed, the risk of disease

transmission amplifies. Complying with some protocols, such as wearing face masks, can thus reduce the risks, and gatherings, especially with no proper ventilation, are risk factors for a spike in infection cases (13).

In this sense, public places and workplaces accelerate the spread of COVID-19 (14), wherein people are more susceptible to the virus due to crowds (15). Some jobs that are directly in touch with clients or customers, such as healthcare, transportation system, restaurant, and cemetery workers, as well as those traveling frequently (14, 16), stylists (17), and the like are at greater risk, so they need to observe public health protocols much more (14). In spite of numerous precautions, some people and business owners do not follow public health protocols for COVID-19 for a host of reasons, such as individual, structural, economic, and sociocultural factors (18). In this context, Liem et al. (2020) further reported that migrant workers could not grasp the gravity of the pandemic and how to protect themselves, and even failed to comply with public health protocols due to no access to reliable information in their own languages (19).

Given the utmost importance of the constant change in COVID-19 under the influence of people's behavior, thereby threatening health following no observance of public health protocols for COVID-19, the present study aimed to investigate public participation (PP) in adopting PHBs during this pandemic, to help health policymakers understand people's behaviors, and then plan to improve their performance and curb the disease

Materials & Methods

Using a field research method, this applied, descriptive cross-sectional study was conducted in the city of Urmia, West Azerbaijan Province, Iran, in March 2020. For this purpose, two statistical populations, viz., the general population and public places, were recruited. To determine the sample size of the general population, the ratio estimate formula below was operated, according to the study by Nourmoradi et al. (2020) (20), wherein about 52% of the participants had shown a good performance

regarding the COVID-19 prevention ($p = 0.52$). Taking account of the confidence interval (CI) of 95% and the maximum permissible error ($d = 0.02$), the required samples were estimated to be 2,398 individuals.

$$n = \frac{(z_{1-\frac{\alpha}{2}})^2 \times p(1-p)}{d^2} = \frac{(1.96)^2 \times 0.52 \times 0.48}{(0.02)^2} = 2398$$

Assuming that an average of 10 people were present when the researcher referred to the public places to complete the questionnaires, about 240 places were needed as the sample size. To achieve this, 240 public places were to be selected from 30 neighborhoods in the city of Urmia, an average of eight public places from each one had to be examined. Given that eight public places were required for investigation (including banks, public transport vehicles, filling stations, bakeries, electronic government services offices, shopping centers and stores, beauty salons, and restaurants and diners) in each neighborhood, at least one was selected by convenience sampling and explored, to meet the sample size in this study. In cases where the desired locations were not found in a neighborhood, this was observed several times in other neighborhoods at specific time intervals.

The data collection tool was a researcher-made 47-item questionnaire about public health protocols for COVID-19 in public places. Each item was scored based on a 4-point Likert-type scale, (including good, moderate, poor, and very poor). In this way, it was considered as good if 75-100% of the observed people followed the desired PHBs. Along these lines, it was moderate if 50-75% of people complied, and it was poor or very poor if 25-50% or 0-25% of people followed them, respectively.

The initial items of the given questionnaire were designed based on the public health protocols approved by the Iran's National Headquarters against COVID-19 (INHAC) in eight public places, whose validity and reliability were measured and endorsed. To this end, face and content validity were exploited to determine

validity, so the questionnaire was submitted to 10 experts in social medicine, health education and health promotion, public health, statistics, and epidemiology. These experts were asked to provide their revisions in a written form from a qualitative perspective. They were further requested to assess the appropriateness and relevance of the questionnaire, the possible ambiguities and insufficient understanding of the phrases and words of the items, grammatical errors, the appropriate placement and prioritization of the items, and the time required to complete the questionnaire. Finally, their comments were obtained, and included in the questionnaire. Moreover, Cronbach's alpha coefficient was employed to measure the reliability of the questionnaire. For this purpose, 30 questionnaires were completed in a pilot study, and then Cronbach's alpha coefficient was calculated, which was above 0.70 for all public places observed.

The questionnaires were voluntarily completed by 30 members of the House of Public Participation in Health in the city of Urmia, and upon visiting the public places by natural observation. In this way, the researcher considered the questionnaire items and completed them in the corresponding public places by referring to the sampling locations and maintaining an appropriate distance. Since the observation method was of the naturalistic concealed type, the researcher tried to keep their identities hidden. Before the study, briefing sessions were also held for the observers, and they received training on how to accurately complete the questionnaires. The data were further analyzed using the IBM SPSS Statistics ver.16 (SPSS Inc., Chicago, IL, USA), via descriptive statistics (i.e., frequency and percentage).

Results

In this study, eight public places were observed, as outlined in Table 1. With regard to the small number of some public places in the city of Urmia, such as electronic government services offices, or those closed due to the COVID-19 restrictions, such as restaurants and diners, the existing items were consecutively observed within specific time intervals.

Table 1. Frequency distribution of public places and people observed

No.	Public places	Frequency of observed public places (N)	Percentage	Frequency of observed people (N)	Percentage
1	Banks	38	15.8	380	15.8
2	Public transport vehicles	37	15.4	370	15.4
3	Filling stations	21	8.75	210	8.75
4	Bakeries	40	16.7	400	16.7
5	Electronic government services offices	19	7.95	190	7.95
6	Shopping centers and stores	38	15.8	380	15.8
7	Beauty salons	25	10.4	250	10.4
8	Restaurants and diners	22	9.2	220	9.2
9	Total	240	100	2400	100

Most banks observed in this study were at a good level in terms of face mask use by customers (60.8%) and the installation of educational materials and posters regarding COVID-19 prevention (35.9%). Moreover, complying with public health protocols during banking

operations (42.5%), maintaining social distancing at banks (41.2%), following protocols at cash machines (35.5%), and practicing social distancing at cash machines (37.5%) were at a moderate level in most cases (Table 2).

Table 2. Frequency distribution of following public health protocols for COVID-19 at banks (N = 240)

No.	PHBs	Very poor	Poor	Moderate	Good
		Frequency (percentage)	Frequency (percentage)	Frequency (percentage)	Frequency (percentage)
1	Do customers wear face masks?	5 (2.1)	13 (5.4)	76 (31.7)	146 (60.8)
2	Are hygiene standards (viz., use of gloves, etc.) observed during banking operations or when using appointment machines?	27 (11.2)	73 (30.4)	102 (42.5)	38 (15.8)
3	Is social distancing of at least 1.5 meters observed while standing at the bank?	32 (13.3)	65 (27.1)	99 (41.2)	44 (18.3)
4	Are educational materials and posters regarding COVID-19 prevention visible to customers?	31 (12.9)	49 (20.4)	74 (30.8)	86 (38.9)
5	Are hygiene standards (i.e., use of gloves, tissues, etc.) followed during the use of cash machines?	55 (22.9)	82 (34.2)	85 (35.5)	18 (7.5)
6	Is social distancing of at least 1.5 meters observed while standing in line at cash machines?	36 (15.0)	74 (30.8)	90 (37.5)	40 (16.7)

Considering face mask use on most observed public transport vehicles, passengers (55.8%) were at a good level. As well, maintaining social distancing (0.35%), using smart cards to pay fares (48.7%), and wearing

personal protective equipment by drivers (35%) were at a moderate level. Complying with the public health protocols for a maximum of two passengers in the back seat of taxis as public transport vehicles was at a poor level (70%) (Table 3).

Table 3. Frequency distribution of following public health protocols for COVID-19 on public transport vehicles (N = 240)

No.	PHBs	Very poor	Poor	Moderate	Good
		Frequency (percentage)	Frequency (percentage)	Frequency (percentage)	Frequency (percentage)
1	Is social distancing of at least 1.5 meters observed on buses?	53 (22.1)	72 (30)	84 (35)	31 (12.9)
2	Do passengers wear face masks?	4 (1.7)	26 (10.8)	76 (31.7)	134 (55.8)
3	Are smart cards used to pay for bus fares?	17 (7.1)	36 (15)	117 (48.7)	70 (29.2)
4	Do taxi drivers use personal protective equipment (viz., face masks, gloves, and disinfectants)?	7 (2.9)	35 (14.6)	108 (45)	90 (37.5)
5	Are public health protocols for a maximum of two passengers in the back seat of taxis observed?	168 (70)	44 (18.3)	19 (7.9)	9 (3.8)

The bulk of the filling stations observed were at a moderate level in respect of providing personal preventive equipment to customers (51.6%) and

installing educational materials and posters regarding COVID-19 prevention (0.37%). Besides, most cases were at a good level in terms of compliance with public health protocols by attendants (45.8%) (Table 4).

Table 4. Frequency distribution of following public health protocols for COVID-19 at filling stations (N = 240)

No.	PHBs	Very poor	Poor	Moderate	Good
		Frequency (percentage)	Frequency (percentage)	Frequency (percentage)	Frequency (percentage)
1	Do filling stations provide personal preventive equipment (such as gloves) to customers?	31 (12.9)	27 (11.2)	124 (51.6)	58 (24.2)
2	Do attendants follow public health protocols (using face masks, gloves, etc.)?	19 (7.9)	39 (16.2)	72 (30.0)	110 (45.8)
3	Are there educational materials and posters regarding COVID-19 prevention visible to customers?	49 (20.4)	52 (21.7)	89 (37.0)	50 (20.8)

For the most part, the restaurants and diners observed in terms of compliance with public health

protocols for COVID-19 were at a moderate level (Table 5).

Table 5. Frequency distribution of following public health protocols for COVID-19 in restaurants and diners (N = 240)

No.	PHBs	Very poor	Poor	Moderate	Good
		Frequency (percentage)	Frequency (percentage)	Frequency (percentage)	Frequency (percentage)
1	Are hygiene standards (viz., use of face mask, gloves, and hand washing) followed in case of emergency?	20 (8.3)	22 (9.2)	107 (44.6)	91 (37.9)
2	Do customers avoid ordering food prepared directly by hand and without cooking with a stove?	19 (7.9)	52 (21.7)	105 (43.8)	64 (26.7)

No.	PHBs	Very poor	Poor	Moderate	Good
		Frequency (percentage)	Frequency (percentage)	Frequency (percentage)	Frequency (percentage)
3	Is ordering raw food without industrial packaging, such as salads, avoided?	19 (7.9)	62 (25.8)	95 (39.6)	64 (26.7)
4	Are hygiene standards (i.e., use of face masks, gloves, and disinfectants) observed by restaurant operators?	15 (6.2)	41 (17.1)	117 (48.8)	67 (27.9)
5	Are packaged bread, as well as disposable or packaged spoons, forks, and plates used when serving food?	24 (10.0)	42 (17.5)	94 (39.2)	80 (33.3)
6	Do customers swipe bank cards in card readers, and do cashiers enter the amount and pin code when paying?	12 (5.0)	33 (13.8)	104 (43.4)	91 (37.8)
7	Are restaurant operators sure of their staff's health (e.g., no symptoms of cold or flu)?	30 (12.5)	68 (28.3)	92 (38.3)	50 (20.8)
8	Are educational materials and posters about COVID-19 prevention visible to customers in restaurants and diners?	30 (12.5)	58 (24.2)	89 (37.1)	63 (26.2)

A big part of the beauty salons observed were at a moderate level in terms of compliance with all public health protocols for COVID-19, except for the use of personal preventive equipment by stylists, which was at a good level (47.1%) (Table 6).

Table 6. Frequency distribution of following public health protocols for COVID-19 in beauty salons (N=240)

No.	PHBs	Very poor	Poor	Moderate	Good
		Frequency (percentage)	Frequency (percentage)	Frequency (percentage)	Frequency (percentage)
1	Do stylists use personal protective equipment (e.g., gloves, face masks, and disinfectants)?	26 (10.8)	16 (6.7)	85 (35.4)	91 (37.9)
2	Do customers bring face masks, gloves, and disinfectants?	17 (7.1)	57 (23.8)	110 (45.8)	113 (47.1)
3	Do customers use personal or disposable towels, headbands, and aprons?	54 (22.5)	78 (32.5)	87 (36.2)	56 (23.3)
4	Do beauty salons minimize the time customers spend there?	12 (5.0)	69 (28.8)	118 (49.2)	21 (8.8)
5	Is there proper ventilation in beauty salons?	11 (4.6)	89 (37.1)	95 (39.6)	41 (17.1)
6	Are appointment systems and social distancing observed in beauty salons?	13 (5.4)	81 (33.8)	99 (41.2)	45 (18.8)
7	Are bank card readers used to receive payments?	13 (5.4)	25 (10.4)	107 (44.6)	47 (19.6)
8	Are there educational materials and posters regarding COVID-19 prevention visible to customers in beauty salons?	45 (18.8)	62 (25.8)	80 (33.3)	53 (22.1)

The majority of the observed bakeries maintained social distancing (46.7%), avoided cash (47.9%), and used preventive measures by sellers (42.5%) at a

moderate level. In terms of no contact with the counter (37.5%) and face mask use (57.5%), a good level was additionally observed (Table 7).

Table 7. Frequency distribution following public health protocols for COVID-19 in bakeries (N = 240)

No.	PHBs	Very poor	Poor	Moderate	Good
		Frequency (percentage)	Frequency (percentage)	Frequency (percentage)	Frequency (percentage)
1	Do customers hold bread bags in their hands so that they do not touch the counter?	12 (5.0)	50 (20.8)	88 (36.7)	90 (37.5)
2	Is social distancing at least 1.5 meters away observed when buying bread?	30 (12.5)	67 (27.5)	112 (46.7)	31 (12.9)
3	Is it forbidden to pay cash to sellers?	16 (6.7)	68 (27.9)	115 (47.9)	42 (17.5)
4	Do sellers use personal protective equipment (viz., face masks, gloves, and disinfectants)?	18 (7.5)	38 (15.8)	102 (42.5)	82 (34.2)
5	Do customers wear face masks?	4 (1.7)	32 (13.3)	66 (27.5)	138 (57.5)

Considering the electronic government services offices in terms of face mask use by clients (54.2%) and the use of personal protective equipment by staff (77.1%), they were at a good level. As well, providing

no services to clients without face masks (37.5%) and maintaining social distancing (44.6%) was at a moderate level, and planning to provide services so as not to cause overcrowding (40.4%) was at a poor level (Table 8).

Table 8. Frequency distribution of following public health protocols for COVID-19 in electronic government services offices (N = 240)

No.	PHBs	Very poor	Poor	Moderate	Good
		Frequency (percentage)	Frequency (percentage)	Frequency (percentage)	Frequency (percentage)
1	Do clients use face masks?	2 (0.8)	10 (40.8)	98 (40.8)	130 (54.2)
2	Is it prohibited to provide services to clients without face masks?	27 (11.2)	53 (22.1)	90 (37.5)	70 (29.2)
3	Is planning to provide services done in such a way that it does not cause overcrowding?	26 (10.8)	97 (40.4)	69 (28.8)	48 (20)
4	Does staff use personal protective equipment (e.g., face masks, gloves, and disinfectants)?	3 (1.2)	13 (5.4)	39 (16.2)	185 (77.1)
5	Is social distancing at least 1.5 meters away observed during standing in a line in these offices?	35 (14.6)	51 (21.2)	107 (44.6)	47 (19.6)

The bulk of shopping centers and stores were at a good level with regard to face mask use by customers (63.7%), use of personal protective equipment by sellers (47.9%), swiping bank cards by customers themselves (40.4%), and installing educational

materials and posters (34.6%). Not taking children to shopping centers and stores (43.4%), touching no high-contact objects, such as handrails (45.8%), and avoiding food handling by customers (43.4%) were also at the moderate level (Table 9).

Table 9. Frequency distribution of following public health protocols for COVID-19 in shopping centers and stores (N = 240)

No.	PHBs	Very poor	Poor	Moderate	Good
		Frequency (percentage)	Frequency (percentage)	Frequency (percentage)	Frequency (percentage)
1	Do customers wear face masks?	2 (0.8)	18 (7.5)	67 (27.9)	153 (63.7)
2	Is it forbidden to take children to shopping centers and stores?	27 (11.2)	75 (31.3)	104 (43.4)	34 (14.2)
3	Do sellers use personal protective equipment (viz., face masks, gloves, and disinfectants)?	10 (4.2)	24 (10.0)	91 (37.9)	115 (47.9)
4	Do customers avoid touching high-contact objects, such as handrails?	23 (9.6)	75 (31.2)	110 (45.8)	32 (13.3)
5	Do customers swipe bank cards in card readers, and do cashiers enter the amount and pin code when paying?	5 (2.1)	43 (17.9)	95 (39.6)	97 (40.4)
6	Do customers simply take the food they need from the shelves and avoid handling others?	15 (6.2)	79 (32.9)	104 (43.4)	42 (17.5)
7	Are educational materials and posters about COVID-19 prevention visible to customers?	32 (13.3)	46 (19.2)	79 (32.9)	83 (34.6)

Discussion

This study investigated PP in adopting PHBs during COVID-19 in the city of Urmia, West Azerbaijan Province, Iran, generally indicating that following the public health protocols for the pandemic in the selected public places in this region was at a moderate-to-good level. In this context, Malekzadeh et al. (2021) had further reported proper compliance with such protocols (21). These findings revealed that public perceptions of the importance of observing and performing correct PHBs in public places could help in the prevention and control of COVID-19. Nevertheless, some research had established that observing the given protocols was not favorable (22, 23), thereby demanding more interventions and awareness-raising measures.

As observed, face mask use in seven public places in this study was evaluated as good, which was in agreement with previous surveys (21, 24). Chen et al. (2020) had similarly shown that wearing face masks was an acceptable step toward preventing the spread of COVID-19 in China (25). The use of face masks had been thus much highlighted as one of the most important preventive measures against this pandemic due to education and justification of its positive

consequences in many public places, so it should be maintained to ensure that the virus does not spread.

Practicing social distancing in the public places observed in this study was moderate. In this vein, Ehsani (2020) had shown that observing social distancing in pharmacies could have a significant effect on customer satisfaction (26), but the results reported by Malekzadeh et al. (2021) were not so, as social distancing was high (21). The reason for this discrepancy was selecting different statistical populations, e.g., Malekzadeh et al. (2021) recruited students as the target population whose compliance was higher than that of adults and the general population. Something important about observing social distancing is its high effectiveness in preventing the virus transmission, so there should be much emphasis on following public health protocols for COVID-19 in public places, such as banks, public transport vehicles, electronic government services offices, etc.

Using other modes of prevention, such as gloves, disinfectants, or tissues, in public places in this study, such as banks, filling stations, beauty salons, etc., by clients, operators, attendants, and service providers,

was also at a moderate level, and even at a high level in electronic government services offices and shopping centers and stores. According to Ehsani (2019), compliance with public health protocols for COVID-19 at the entrance and exit of the pharmacies and disinfecting the counter had been at a good level, which had met consequently customer satisfaction (26). Similar results were further obtained by Rukuni and Maziri (2020) in chain stores in South Africa (27). This indicated that the use of preventive measures and compliance with protocols could help in encouraging people to maintain PHBs and prevent the disease, and at the same time feel satisfied with being in public places.

The installation of educational materials and posters regarding COVID-19 prevention visible to customers at banks, shopping centers, and stores, was at a high level, and that was moderately observed at filling stations, restaurants and diners, and beauty salons. Considering the importance of education about COVID-19, especially at the outbreak of the disease, it was thus essential to install educational materials and posters in public places, to increase people's knowledge about the pandemic and how to perform PHBs, which could be a big step toward disease prevention.

In restaurants and diners, practices such as avoiding ordering raw food without industrial packaging, using packaged bread and disposable spoons, forks, and plates, swiping bank cards by customers, and performing banking operations by cashiers were evaluated at a moderate level. Kang et al. (2021) demonstrated that the request to comply with public health protocols for COVID-19 had been perceived differently by restaurant customers, and not everyone had shown the same reactions (28). Belarmino and Repetti (2020) had also reported that face mask use by restaurant staff was associated with the willingness of the customers to pay by bank cards themselves (29). Additionally, Byrd et al. (2021) found that the tendency to order cold and raw food was small due to the fear of contracting COVID-19 (30). This showed that people were partially aware of the importance of

following the public health protocols for COVID-19 to prevent the spread of the virus. To strengthen and maintain such PHBs and bring them to the optimal level, education and a better understanding of the results of following the protocols were of utmost importance.

Among the negative points related to compliance with the public health protocols for COVID-19 observed in the electronic government services offices was the lack of planning to provide services in a way that would not cause overcrowding, as these offices were crowded in most cases. This could have a significant effect on the persistence of the virus and the high rate of infection, to the extent that whenever crowding in public places was avoided, the number of confirmed cases could decrease after some time. Therefore, there is a need to prevent overcrowding and even lock down crowded public places during the high prevalence of this disease. In line with the findings in the present study, Eroglu et al. (2022) demonstrated that crowding in shopping centers could cause dissatisfaction among customers, thereby declining their desire to attend and buy (31).

In shopping centers and stores, not taking children, avoiding touching high-contact objects, such as handrails, and simply getting the food needed from the shelves and avoiding handling others by customers were at a moderate level. On the other hand, swiping bank cards in card readers and entering the amount and pin codes by cashiers were at high levels. Shopping centers and stores were among crowded public places that could play a leading role in the transmission of the virus, so it was essential to implement health measures and comply with protocols well under strict monitoring.

According to the review of the related literature, this study was the first attempt in this field, to the best of the authors' knowledge, thus it could pave the way for future surveys, as one of the strengths of the present study. The dispersion of public places and the need to spend much time on observations, along with the completion of the questionnaire items, were among the major limitations in this study. Future research can

accordingly reflect on more public places and jobs, employ other methods, such as cross-sectional designs based on self-reporting questionnaires, and develop educational interventions in jobs in which compliance with public health protocols for COVID-19 has been poor.

Conclusion

The study results established that PP in the adoption of PHBs during COVID-19 in the city of Urmia, West Azerbaijan Province, Iran, was not at the desired level, so it was necessary to provide the conditions to strengthen and maintain such behaviors. Given that the speed of virus transmission was higher in public and crowded places, formulating policies, developing interventions, and implementing relevant programs were vital. In this regard, it is critical to shed light on appropriate PHBs and provide training to boost those at the moderate-to-poor levels. Running advertising campaigns, designing and implementing educational interventions for various trade guilds and jobs, conducting advisory activities, and exploiting social media to inform and train the general population can thus help deal with this emergency situation.

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Conflict of interests

The authors declare they have no conflict of interest in this study.

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Data availability

The raw data supporting the conclusions of this article are available from the authors upon reasonable request.

Ethical statement

This study received ethical approval from the Research Ethics Committee of Urmia University of Medical Sciences (IR.UMSU.REC.1400.120).

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