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ORIGINAL ARTICLE

COVID-19- HAB scale: Validation of a scale of perception of habits shifting during the COVID-19 pandemic

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ABSTRACT

Introduction: The COVID-19 pandemic has made the daily life difficult for thousands of people around the world. The measurements taken by many governments have reduced personal liberties and obligated many to change their habits and lifestyles.

Objective: To validate a scale that measures the perception of habits shifting during the COVID-19 pandemic.

Methods: This was an instrumental, analytical, and cross-sectional study with a pilot sample of 417 respondents. A form validation was carried out with the participation of 10 experts who evaluated the scale. Their assessments were used to calculate Aiken coefficient. The explorative factor analysis was carried out using KMO and Bartlett test. Finally, Cronbach's alpha was calculated to get internal consistency.

Results: The KMO measure was 0.92 and the Bartlett test was significative. With these results, factor determination was performed resulting in a 1-factor model which contains 71.45% of the total variance and with factorial charges between 0.46-0.88. Then, Cronbach's coefficient was 0.89, assuring good reliability to the scale.

Conclusion: The COVID-19-HAB scale is a validated scale and it could be applied to measure the habits acquired by the general population during health emergencies such as the COVID-19 pandemic.

Key words: Validation study; Habits; Pandemics; COVID-19.

INTRODUCTION

On these later days, the current pandemic provoked by SARS-CoV-2 (COVID-19) has generated many changes in the habits and regular behavior of the population (1,2). Many of these changes have been produced by the evolution of government politics that each country has stated to flatten the epidemiologic curve (3). So, these include some unconventional measurements such as: social isolation, close of borders, cessation of economic and social activities (4); as well as preventive measurements (wash of hands, mask use, etc.) to reduce case spreading (5).

Such measurements of physical distancing and self-isolation have impacted in citizens' daily life, shifting their particular habits and daily behaviors to new ones (6,7), such as sedentary, that leads to different metabolic diseases, obesity, blood pressure increase, and others (8,9). For this reason, public health optimization during the current pandemic requires not only knowledge of biologic and medical sciences, but also social and behavior studies, including feeding habits and lifestyle (10). On the other hand, a great amount of the population shifted their behaviors according to the measurements promulgated by government and experts since the beginning of the health emergency (11). However, there are also people who do not follow social measurements adequately. Thus, more studies that analyze these variables during and after the pandemic are required to find more effective strategies for the population (12).

In this way, facing the exponential growth of the pandemic, health professionals, organizations and others have recommended that the population maintain an active and healthy lifestyle as an important approach to deal with COVID-19 and the possible consequences of social lockdown, with other measurements adopted by different sectors (13). In view of this, the main objective of this study was to validate a scale that measures the perception of habits shifting during the COVID-19 pandemic.

METHODS

Design of the study: An instrumental, analytic, and cross-sectional study was performed (14).

Participants: Participants were selected through a non-probabilistic and by convenience type sampling. The sample was constituted of 417 people from both genders, 257 men and 160 women whose ages were between 18 and 60 years. Mean age was 35.03 y SD = 13.52.

Instrument: The COVID-19-HAB scale measures acquired habits during the current pandemic that avoid disease dispersion. It is composed of 8 items that were proposed by authors after realizing an exhaustive bibliographic search in different data bases related to the topic. It has 5 answer options (strongly disagree, disagree, indifferent, agree and strongly agree).

Proceedings: In the first place, the COVID-19-HAB scale was designed by the investigation team based on a bibliographic search. Then, evidence of the content's validity of the scale was analyzed so that 10 experts' judgment was solicited (5 epidemiologists, 3 public health

specialists and 2 psychologists), so that items' relevancy, representation, and clarity was analyzed (15). After that, the COVID-19-HAB scale shape's validation was performed, with this goal was administrated individually through Google Drive sheets (due to the emergency state and quarantine declared by the Peruvian government). Before the scale's application, the objective of the study was explained to the participants, and, after that, their verbal consent was required before filling out the survey. With the results, a data base was created in a Microsoft Excel 2019 sheet.

Statistical analysis: With the obtained information, descriptive analysis was performed to obtain mean, standard deviation, asymmetry, and items' kurtosis. In the second place, explorative factorial analysis (EFA) was executed by squares minimums, with oblique promin rotation, in base of Pearson correlation matrix. It is so that the Bartlett test and Kaiser-Meyer-Olkin coefficient (KMO) were used. Parallel analyses showed that all items get into one factor. Finally, to evaluate the scale's internal consistency, Cronbach's Alpha coefficient was used.

Descriptive analysis and EFA was performed with statistic software FACTOR Analysis and SPSS version 24.0 was used to calculate reliability.

RESULTS

Preliminary analysis of the items: In **table 1**, the mean, standard deviation, asymmetry, kurtosis, and communalities for COVID-19-HAB scale's 8 items are shown. The item 5 has the highest average score (M = 2.27) and the item 8, the lowest (M = 1.01). With respect to variability, the item 10 (SD = 1.51) shows greater dispersion. Scale's asymmetry and kurtosis values do not exceed > ± 1.5 (16), that indicates a normal distribution of the items. However, items 4, 5 and 6 (you use a N95 mask or a more complex one, you use a cloth mask or a handcrafted one, you use another way of protection when going out [cap, glasses, plastic mask, etc.]), were eliminated for presenting a communality lower than 0.3.

Explorative factorial analysis: The KMO measure was 0.92 and the Bartlett sphericity test (3075.1; gl = 28), both were acceptable and significative. Thus, performing AFE was appropriate.

Following, the number of factors were determined, so that the estimation by non-pondered square minimums with promin rotation was used (17). And for the number of factors' determination, a parallel analysis proposed by Horn was performed (18), reporting 1 factor structure. The obtain factor explains the 71.45% of the total variance of the test and its factorial charges were between 0.46 and 0.88 (**Table 2**).

The **table 3** shows a descriptive result for the 8 items of the COVID-19-HAB scale. They were adequate and reported moderate correlations and significance among the items (> 0.6). Regarding the reliability of the test, Cronbach's alpha coefficient was 0.89 (CI95% = 0.85-0.91), that indicates good reliability for the COVID-19-HAB scale.

Table 1. Descriptive results of COVID-19-HAB scale.

Items	M*	SD†	As‡	K§	H**
Item 1	1.09	1.46	1.15	-0.18	0.89
Item 2	1.42	1.44	0.73	-0.86	0.62
Item 3	1.28	1.45	0.84	-0.72	0.59
Item 4	1.89	1.38	0.09	-1.19	0.24
Item 5	2.28	1.43	-0.20	-1.27	0.09
Item 6	1.73	1.45	0.30	-1.19	0.29
Item 7	1.03	1.40	1.22	0.06	0.86
Item 8	1.02	1.42	1.20	-0.02	0.79
Item 9	1.47	1.40	0.58	-0.93	0.52
Item 10	1.44	1.52	0.60	-1.1	0.47
Item 11	1.19	1.48	0.91	-0.66	0.69

*M: men, †SD: standard deviation, ‡As: asymmetry, §K: Kurtosis, **h: communalities.

Table 2. Explorative factorial analysis of COVID-19-HAB scale.

Items	F1	h2
1. You wash your hands with more frequency.	0.94	0.88
2. You use more gel alcohol.	0.78	0.61
3. You use more surgical masks or a simple one.	0.77	0.59
4. You maintain a physical distance bigger than a meter in face of others.	0.93	0.87
5. You avoid going to places with great agglomeration (banks, markets, etc.).	0.89	0.80
6. You buy more things to stock if they are required.	0.72	0.52
7. You have cancelled/postergated the trips that you have planned in the coming months.	0.68	0.46
8. You have cancelled/postergated celebrations or familiar meeting or friendly meetings that you have planned in the coming months.	0.84	0.7

Table 3. Descriptive analysis of the 8 items on the COVID-19-HAB scale.

Items	M*	SD**	As***	K†	h‡	ritc	α§
Item 1	1.09	1.46	1.15	-0.18	0.88	0.90	0.93
Item 2	1.42	1.44	0.73	-0.86	0.61	0.76	0.94
Item 3	1.28	1.45	0.84	-0.72	0.59	0.74	0.94
Item 4	1.03	1.40	1.22	0.06	0.87	0.89	0.93
Item 5	1.02	1.42	1.20	-0.02	0.80	0.86	0.93
Item 6	1.47	1.40	0.58	-0.93	0.52	0.70	0.94
Item 7	1.44	1.52	0.60	-1.1	0.46	0.66	0.94
Item 8	1.19	1.48	0.91	-0.66	0.7	0.82	0.93

* M: mean, **SD: Standard deviation, ***As: asymmetry, †K: kurtosis, ‡h: communalities, §α: Cronbach's alpha.

DISCUSSION

The COVID-19-HAB scale is an instrument of 8 items that measure the adequate habits acquired during the COVID-19 pandemic. All the items get into 1 factor, and they have demonstrated representative, clarity and relevance. At the same time, they are adequate and comprehensible. Furthermore, they have evidence of consistency and reliability.

Additionally, of isolation measurements and social distancing, personal protection habits are key to reduce the spreading of infectious diseases, such as SARS-CoV-2 disease (19). So, one of the items that are measured in this study is related to washing hands, being this one of the

principal strategies of prevention as well as personal and social protection. In Wuhan, China, a survey of elementary school's students showed that only 42.05% had an adequate technique of washing hands (20). Another study in Korea in 4011 participants that were followed up during MERS-CoV outbreak in 2015 and 2002 participants that were followed up during the current COVID-19 pandemic found that the washing hand rate during the 2015 outbreak enhanced 1.3 times in comparison with the current pandemic (21). On the other hand, in India 87% of the surveyed followed the advices and informed that they washed their hands with water and soap regularly (22).

Another crucial item that is evaluated in this research is the use of facial masks; as its use by itself could not be the best strategy to prevent the spreading of viral respiratory disease in the community, but in combination with other non-pharmacological interventions (such as one-meter distancing) they can reach their maximum benefit (23,24). In a study in Hubei (China), 98% used facial masks when they got out of their addresses during the pandemic (25). Furthermore, in India, only 56% of the surveyed looked for an adequate way to use facial masks although 73.38% were using them to avoid spreading (22).

About the item that appraises the habit of one-meter distancing in face of others, the results of a Korean survey showed that in this worldwide health emergency most of the surveyed claimed to comply with the social distancing (21) and it was understood its need for delaying or flattening the epidemiologic curve. It was shown that if the contact rate is reduced to 25% in the adult population, in combination with a reduction of 95% in the elder population, the number of hospitalizations and deaths could be reduced to 78% during the first 100 days (26), and, subsequently, epidemic suppression is the only viable strategy (27). However, maintaining social distancing during many months could not be economic and social practicable. On the other hand, social distancing interventions by themselves could not control the pandemic, these efforts must be combined with a good health system (28).

At the same time, avoiding places with agglomeration is key to avoid spreading. A survey performed in China revealed that 95.7% of the participants avoided big crowds and remained at home for the most time possible (29). If social distancing is ignored, especially in crowded places, spreading will increase (21) according to a short or long time of immunity, and it will favor annual or biannual (30) outbreaks hindering normal development.

The principal limitation of this validation study is the number of participants that takes part in this research. Thus, we consider that investigators need to be careful when they try to extrapolate its results. However, due to the nature of this study, this scale can be applied to populations with similar contexts to Peru such as: Bolivia, Ecuador, Colombia, Chile, and Argentina. At the same time, we consider that due to the relevance of the items in this study, this scale can be applied to perform future investigations with bigger populations.

Thus, it is concluded that the COVID-19-HAB scale is a validated scale and it could be applied to measure the habits acquired by the general population during health emergencies such as the COVID-19 pandemic.

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