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Telephone messages regarding preventive measures against COVID-19

Mensagens telefônicas frente às medidas preventivas contra COVID-19

Mensajes telefónicos frente a las medidas preventivas contra el COVID-19

Vinicius Lino de Souza Neto[a]
Camila Takao Lopes[a]
Alba Lucia Bottura Leite de Barros[a]
Mônica Taminato[a]
Vinícius Batista Santos[a]
Juliana de Lima Lopes[a]

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ABSTRACT

Objective: To analyze the evidence of content validity of telephone messages regarding preventive measures against COVID-19.
Method: Methodological study, in which messages containing text and image were developed through a narrative literature review and whose content was evaluated by eight judges in terms of clarity, practical relevance, theoretical relevance and vocabulary. The content validity index (CVI) was calculated, and messages that reached levels above 90% were considered to have adequate evidence of validity.
Results: Eighteen text messages/images were developed containing information about COVID-19, hand hygiene, use and handling of masks and the importance of social distancing. After second round of evaluation, a content validity index above 90% was obtained in all evaluated indicators.
Conclusion: The telephone messages were developed and showedadequate evidence of content validity.
Descriptors: COVID-19. Disease prevention. Text messaging.

RESUMO

Objetivo: Analisar as evidências de validade de conteúdo de mensagens telefônicas frente as medidas preventivas contra a COVID-19.
Método: Estudo metodológico, em que as mensagens contendo texto e imagem foram desenvolvidas por meio de uma revisão narrativa de literatura e que tiveram seu conteúdo avaliado por oito juízes em relação a clareza, pertinência prática, relevância teórica e vocabulário. Calculou-se o índice de validade de conteúdo (IVC), e considerou-se com adequadas evidências de validade, as mensagens que alcançaram índices acima de 90%.
Resultados: Foram desenvolvidas 18 mensagens de texto/imagens contendo informações sobre a COVID-19, higienização das mãos, uso e manuseio das máscaras e a importância do distanciamento social. Após a segunda rodada de avaliação obteve-se um índice de validade de conteúdo acima de 90% em todos os indicadores avaliados.
Conclusão: As mensagens telefônicas foram desenvolvidas e apresentaram adequadas evidências de validade de conteúdo.
Descritores: COVID-19. Prevenção de doenças. Envio de mensagens de texto.

RESUMEN

Objetivo: Analizar las evidencias de validez de contenido de los mensajes telefónicos frente a las medidas preventivas frente al COVID-19.
Método: Estudio metodológico, en el cual se desarrollaron mensajes que contiene en texto e imagen a través de una revisión de literatura narrativa y cuyo contenido fue evaluado por ocho jueces en términos de claridad, relevancia práctica, relevancia teórica y vocabulario. Se calculó el índice de validez de contenido (IVC), y se consideró que los mensajes que alcanzaban niveles superiores al 90% tenían evidencia adecuada de validez.
Resultados: Se desarrollaron 18 mensajes de texto/imágenes con información sobre COVID-19, higiene de manos, uso y manejo de mascarillas y la importancia del distanciamiento social. Luego de la segunda ronda de evaluación, se obtuvo un índice de validez de contenido superior al 90% en todos los indicadores evaluados.
Conclusión: Los mensajes telefónicos fueron desarrollados y presentaron evidencia adecuada de validez de contenido.
Descriptores: COVID-19. Prevención de enfermedades. Envío de mensajes de texto.

[a] Universidade Federal de São Paulo, Escola Paulista de Enfermagem. São Paulo, Brasil.

INTRODUCTION

SARS-CoV-2 is responsible for development of COVID-19, characterized by a clinical condition that ranges from asymptomatic infections to critical situations, such as the potentially fatal acute respiratory distress syndrome[1]. Although there are therapeutic measures to relieve symptoms, there is no specific treatment against this disease[1,2].

To reduce the rate of infection by COVID-19, especially at the beginning of the pandemic, health authorities have emphasized preventive measures such as hand washing, use of face masks and social distancing[2]. Despite the evident importance of these measures, part of the Brazilian population did not adhere to such actions[3]. Nowadays, there is an increase in the number of hospitalizations due to COVID-19, mainly due to the sub-lineage of Omicron BQ.1 in Brazil[4]. Thus, the Scientific Committee to Support the Fight against the COVID-19 Pandemic and the health authorities have again recommended the return to the use of masks, especially in environments with little ventilation, when closer to other people and/or to people who are more susceptible to the development of this disease (e.g. elderly and immunosuppressed)[4]. In this sense, interventions to increase adherence to individual preventive measures are necessary.

For changes in the behavior of a population to occur, it is necessary to implement health education strategies and this teaching-learning process can be performed actively, through direct experiences, or by observation, imitating the behavior of others[5]. Behavioral changes are directly influenced by the feeling of need to change or even maintain desirable behaviors to achieve health. Also, external factors can contribute to behavioral change[5].

It is believed that to increase knowledge about the need to adherence to preventive measures for COVID-19, a communication channel about such practices closer to the population is necessary. Information and Communication Technology (ICT) can be an ally in setting this communication channel, as it is the technology that interferes and mediates informational and communicative processes[6].

ICTs have been suggested as tools to expand access to health care, reduce geographic barriers and the costs involved in prevention and treatment[7]. When used combined with usual care, they enable to strengthen health services and improve the quality of care, either individually or collectively[8].

Among the ICTs, WhatsApp® is an instant messaging application via Internet that enables communication by sharing text/voice messages, images, music and videos[8]. The use of mobile text messaging applications in health care has shown satisfactory results in the integration between theory, clinical practice and self-management in health[8,9].

Studies in different countries verified the effectiveness of the use of WhatsApp® in the adoption of desirable health behaviors. In Kenya, there was greater adherence to antiretroviral drugs by people living with HIV after the implementation of follow-up messages[10]. In Canada, sending text messages to people with depression improved self-management of their health condition[11].

For educational materials to be implemented reliably, it is necessary to evaluate the evidence of content validity, which aims to analyze the relationship between the content of the material developed and the phenomenon of interest, that is, the clarity of the information, the practical relevance and the theoretical relevance, in addition to the general layout of the educational material (clarity of the images, relationship between the images and the text), considered by some authors as one of the phases of content validation and called face validation[14,15].

To the best of the authors' knowledge, no educational materials have been identified in the national literature to be sent to mobile phones for the prevention of COVID-19 transmission and that have undergone content validity analysis.

Thus, this study aimed to analyze the evidence of content validity of telephone messages regarding preventive measures against COVID-19.

METHOD

This is a methodological study conducted in two stages: 1) Development of telephone messages containing text and images; 2) Validation of message content. The present study constituted the initial stage of an experimental research with the objective of evaluating the effectiveness of mobile phone messages in adherence to mask use and social distancing.

Stage 1 – Development of telephone messages

The development of the telephone messages content was conducted by the researchers based on a narrative literature review that aims to describe the state of the art of a given subject from a theoretical point of view. To conduct this review, the following guiding question was used: What are the recommendations related to the use of masks, hand hygiene and social distancing regarding the pandemic caused by SARS-CoV-2?

The search for articles was performed between February and March 2019, in the following databases: Scientific Electronic Library Online (SciELO), US National Library of Medicine/ National Institutes of Health (PUBMED), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Latin American and Caribbean Health Sciences Literature (LILACS), using the health sciences descriptors and Boolean operators: Social isolation OR Personal protective equipment AND Coronavirus.

Original articles were included that addressed SARS-CoV-2 containment measures, published in English, Portuguese or Spanish. No time limits were applied. One of the researchers, who entered the search results on the Rayyan selection platform, conducted the search for articles and two reviewers performed the selection of studies independently. If there was disagreement between the two reviewers, a third reviewer analyzed the inclusion or exclusion of the study. After selection, the two reviewers extracted the main orientation regarding individual measures to reduce the spread of the virus and divided this information into three main domains: hand hygiene, social distancing and use of masks. In addition to the articles, the recommendations of the health authorities were also consulted: the Brazilian Health Regulatory Agency (*Agência Nacional de Vigilância Sanitária* – ANVISA) and the Centers for Disease Control and Prevention (CDC).

In view of the narrative literature review and the identification of information regarding preventive measures against COVID-19, the researchers developed the sentences to compose the messages. These sentences referred action for the implementation of preventive measures related to COVID-19. After its development, a graphic designer, using the TextSticker software, made the diagramming of the messages, including figures that could better describe actions.

Stage 2 – Content validity evidence of the telephone messages

The analysis of content validity evidence was performed by a group of judges, selected for convenience, through a search on the *Plataforma Lattes* of the National Council for Scientific and Technological Development (*Conselho Nacional de Desenvolvimento Científico e Tecnológico*), by subject (infection control or prevention of infection or communicable diseases). The following eligibility criteria were adopted: being a health care professional with a master's or doctoral degree focused on communicable or infectious diseases, a minimum of three years of experience in the field of Infectious Diseases or in pandemic situations and having research experience.

Twelve judges were invited to participate in the research via e-mail, and eight judges responded by remotely signing the informed consent form and receiving the demographic and professional characterization form and a questionnaire for evaluation via Google Forms® of each template in relation to the content of each message and each image.

For each round, a period of 15 days was stipulated for the return of the evaluation of messages and, if not a new email was sent extending the period for another 15 days. The judges were asked to evaluate each message regarding theoretical relevance (whether the message content is related to preventive measures against COVID-19); clarity (if the messages were understandable, regardless of the educational background of the population); practical relevance (whether the messages brought important information for preventive measures against COVID-19) and vocabulary (whether the messages were appropriate regarding the Portuguese language)[16]. This evaluation was performed using a four-point Likert-type scale, with 4 = totally appropriate; 3 = partially appropriate; 2 = partially appropriate; 1 = totally appropriate. If the evaluation was different from 4, suggestions were requested.

The characterization of the judges was performed by means of absolute and relative frequency and by calculating the mean and standard deviation. The judges' evaluations were analyzed using Microsoft Excel, calculating the Content Validity Index (CVI), considering the number of answers 3 or 4, divided by the total number of judges. The average CVI of all messages (S-IVC/Ave) and the individual content validity (I-CVI)[17] were calculated.Messages that reached rates above

90% in all analyzed criteria were considered to have adequate evidence of validity. The messages that did not obtain this CVI were reformulated according to the suggestions and forwarded to the judges for new analysis.

The project was submitted for analysis by the Research Ethics Committee of the institution and was approved under the number: CAAE: 31324820,1,1001,5505. This research complied with all research ethics requirements, ensuring the anonymity of the judges.

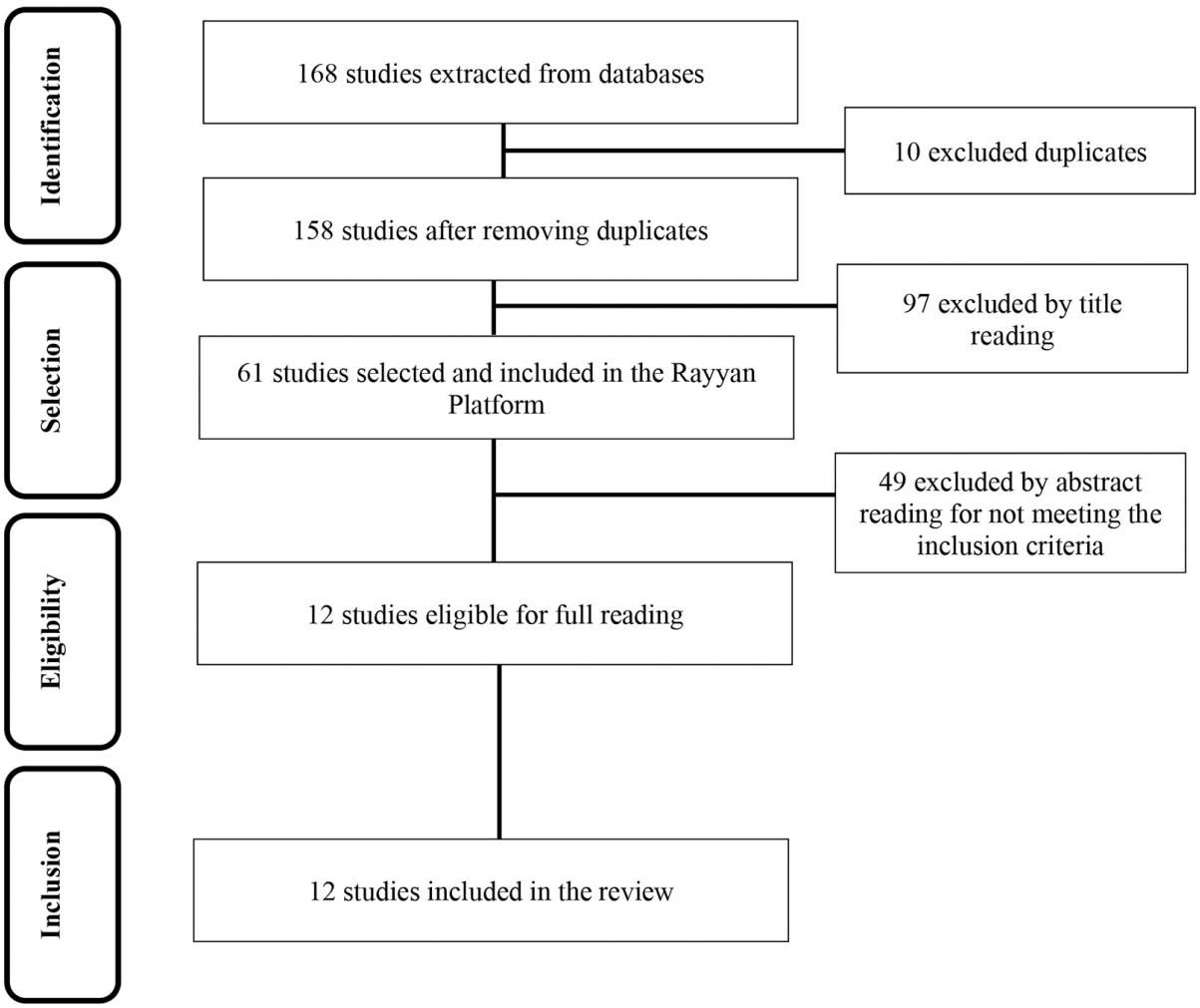
RESULTS

168 articles were identified in the databases by using the subject descriptors and after reading the title and abstract, 61 were selected and inserted into the Rayyan Platform. After solid reading by the two researchers independently, 12 articles were included in this review (Figure 1).

After analyzing and extracting information from the selected articles, 18 messages (text with their respective images) were developed, and a fictional character was created to present each telephone message called "Wandinha".

The content of the messages sent in the first round of evaluation was divided into two messages related to the objective and end of the telephone message program (messages 1 and 18),two messages about COVID-19, its mode of transmission and measures that must be taken for disease prevention (messages 2 and 3), one message related to the importance of social distancing (message 4), three messages related to hand hygiene (messages 5, 7 and 13) and ten messages related to the use of mask (messages 6, 8 to 12, 14 to 17) according to Chart 1.

Figure 1 – Flowchart of the study selection process.



Source: Developed by the authors.

Chart 1 – Initial version of the telephone messages regarding preventive measures against COVID-19. São Paulo, São Paulo, Brazil, 2019-2020

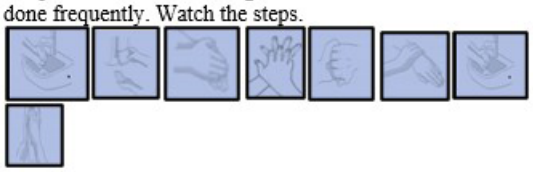
Message number	Initial version of messages
1	Hello! My name is Wandinha. I will send messages every two days with orientation on wearing masks and the importance of staying at home whenever possible at this time. Oh! Share with friends and let's promote health!
2	Did you know that the Coronavirus also known as COVID-19 is mainly transmitted by droplets that come out of our mouths while we talk, sneeze and cough? / And it can also be transmitted by contact, such as handshake and surfaces that contain the virus.
3	For the prevention of the coronavirus, wash your hands well, use the mask and stay at home whenever possible!
4	If you need to leave the house, always wear a mask and keep a distance of at least 1 meter from another person.
5	Hand washing with soap and water or hand sanitizer is one of the preventive measures against the Coronavirus and must be done frequently. Watch the steps. 
6	The mask is a protective measure for the Coronavirus and you should ALWAYS wear it when you leave home! / The mask must contain 3 layers. The outer layer must be water-resistant fabric. The middle layer should be synthetic material and the inner layer should be cotton.

Chart 1 – Cont.

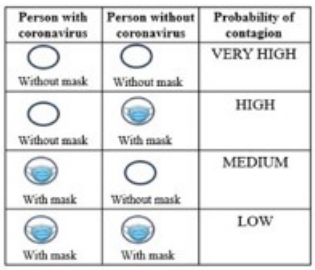
Message number	Initial version of messages
7	Wash your hands with soap and water or use hand sanitizer when: - Touching the mask you are wearing; - Touching an object outside home; - Answering the cell phone
8	To put on the mask, you must take the elastic, then adjust it on the tip of the nose and chin. To remove, take the elastic and put it in a plastic bag.
9	Do you know why everyone should wear a mask? See the chance of contaminating yourself with or without a mask: 
10	
11	There are many types of masks. You must use the mask with 3 layers of fabric. Remember if! Surgical masks and N95 should only be used by healthcare professionals.
12	After using the fabric mask, soak it in a solution of water with bleach (one measure of bleach and three of water) for 20 to 30 minutes. After this period, rinse well under running water to remove any sanitizer residue and wash it apart from other clothes.After washing do ironing.

Chart 1 – Cont.

Message number	Initial version of messages
13	Have you washed your hands today? Don't forget to wash them every time you touch something outside home!
14	When talking on the phone, while on the street, or when going to the bathroom outside home, DO NOT REMOVE THE MASK.
15	Do not touch the front of the mask. If this occurs, IMMEDIATELY wash your hands with soap and water or apply hand sanitizer.
16	Always carry a mask in your bag to change when the one you are using gets wet. After changing, place the mask in a plastic bag. Use hand sanitizer and put the new one on. When you get home, soak them in the bleach solution.
17	The mask is a protective measure against the Coronavirus and should ALWAYS be used when leaving home, such as going to the supermarket, pharmacy, bakery and doing physical activity outside home. You should also use it on the bus, train, subway and in the car when you have other people. You should also always wash your hands.
18	We are finishing the telephone follow-up via WhatsApp@. Don't worry, if you need anything, look for the health unit closest to your home. Do not forget! Leave home only if necessary. If you need to go out, always wear your mask and keep a distance of at least 1 meter from someone else. BELIEVE, everything will be fine!

Source: Developed by the authors.

After its development, the messages were evaluated by eight judges in two evaluation rounds. Most judges were women (87.5%) with a mean age of 38.5+8.03 years. It was observed that 62.5% had a master's degree and 37.5% a doctorate and worked in healthcare (75%) and teaching (25%). The time working in the area was, on average, 13.3+4.08 years.

Table 1 presents the evaluation of the messages by the judges in the first round. It is noticed that the average CVI was above 80% (S-CVI/Ave = 88.6) in all indicators evaluated by this study, however, as messages 1 to 6, 11 to 13, 16 to 18 did not reach the CVI of 90% in at least one evaluation criterion, were modified and resubmitted for a second round.

Table 1 – Content validity index of telephone messages in the first round of judges' evaluation. São Paulo, S**ão** Paulo, Brazil, 2019-2020

Messag.	First round				Second round			
	Rel.	Clar.	Pert.	Voc.	Rel.	Clar.	Pert.	Voc.
1	80.4	81.2	87.6	84.2	90.7	91.3	94.8	92.0
2	85.3	85.6	86.4	88.6	91.8	96.2	93.5	91.5
3	88.1	86.8	84.5	87.1	90.1	94.1	90.7	95.7
4	87.6	89.2	88.2	86.4	93.2	91.7	95.0	92.6
5	88.4	85.4	89.8	85.8	94.6	92.5	92.3	93.1
6	89.1	88.1	81.4	87.9	93.9	90.4	91.6	91.8
7	91.2	90.6	93.5	91.0	NA	NA	NA	NA
8	93.5	91.5	90.2	93.2	NA	NA	NA	NA
9	94.1	93.1	90.1	92.1	NA	NA	NA	NA
10	93.4	90.8	93.7	91.6	NA	NA	NA	NA
11	85.4	88.7	81.2	84.9	90.8	93.3	94.4	90.2
12	88.3	87.2	89.5	88.7	94.1	94.8	92.5	95.6
13	81.8	82.4	84.9	87.3	92.7	90.2	90.8	93.3
14	94.2	93.8	93.2	91.4	NA	NA	NA	NA
15	92.2	94.5	95.8	92.8	NA	NA	NA	NA
16	87.2	87.3	84.1	88.7	90.9	91.0	91.9	92.7
17	86.1	88.1	85.7	86.4	95.4	92.4	96.2	90.2
18	89.2	95.7	92.4	93.8	90.7	96.2	92.5	93.8
I-CVI	88.6	88.8	88.4	88.9	92.6	92.6	92.9	92.4

Source: Developed by the authors.
Legend: Messag: message; Rel: relevance; Clar: clarity, Pert.: practical pertinence; Voc.: vocabulary; I-CVI- Content validity of individual items; NA: not applicable as it reached CVI greater than 90% in all indicators in the first round.

The main suggestions of the judges in this first round were directed to changes in vocabulary and content, such as inclusion of information for washing the fabric mask with soap and water, inclusion of hand sanitizer, inclusion of types of fabrics necessary for the composition of the fabric mask with a triple layer, adjustments regarding the color of the messages and increasing the size of some images.

In the second round of evaluation, feedback was obtained from the same judges of the first round and all messages had a CVI greater than 90% for all the evaluated indicators (S-CVI/Bird = 92.6), as shown in Table 1. Therefore, all messages developed achieved adequate evidence of content validity.

In Supplementary Material 1 is the final version of the messages that presented adequate content validity evidence.

DISCUSSION

In the present study, text messages containing images about preventive measures against COVID-19 were developed for dissemination via WhatsApp® Messenger, and adequate content validity evidence was obtained through the opinion of expert judges.

Telephone messages are tools that have been adopted in different contexts of health promotion and protection, as they promote fast and effective communication[2]. Communication is the ground between personal relationships, it provides information that can be converted into knowledge about the need to change or maintain behavior, and such knowledge can positively persuade[5,16]. In addition, telephone messages can be viewed multiple times and can be updated, which contributes to recycling knowledge[12,18].

Research has been conducted to evaluate the effectiveness of using text messages in the most diverse health care settings. A study developed in a hospital in Pakistan evaluated the effectiveness of the text message system regarding pediatric follow-up and it was observed that it contributed to understanding the mother's universe and the difficulties that patients have[12]. A randomized clinical trial, developed with people who had major depressive disorder, evaluated the effectiveness of supportive text messages twice a day for three months and the results pointed out that supportive text messages can be considered as a useful psychological intervention for depression, especially in poor populations[11]. However, to achieve the expected outcome, it is necessary that the content be based on the best evidence and that its content be validated by a group of judges with extensive experience in the field in question[19].

The messages developed were based on a narrative literature review that aimed to identify the main preventive measures against COVID-19, this phase being essential for the construction of measurement instruments and educational materials[14,15]. With the narrative literature review, it was possible to identify the main orientation regarding the use, types, handling, placement, and removal of masks; forms of sanitizing fabric masks; correct moment and form of hand hygiene; and social distancing measures. General orientation on COVID-19 were also carried out.

The messages developed contained short information with images, which allows for greater content fixation, as studies have shown that the joint use of images and short and simplified texts in messages favor communication on health topics[20,21].

After its development, the messages were sent to a group of judges who, according to the literature, stipulate a group of five to 10 with a high level of expertise in the phenomenon[19,22], which is in line with the number of judges used in the present study. It is also noteworthy that the judges had extensive experience in infectious diseases, which ensured the quality assessment of the messages in view of the suggested changes.

Among the suggestions sent by the judges, the inclusion of hand sanitizer stands out, as it has been considered one of the alternatives for performing this procedure and presents satisfactory results in the reduction of viral load[23,24]. Another suggestion was the inclusion of examples of the types of fabrics needed for the triple layer fabric mask. Masks have been used as a collective protection measure among the population, as they reduce the transmissibility rate[2,25], and it is recommended that they should be composed of a triple layer, the outer layer being made of water-resistant fabric, the medium with tissue capable of acting as a filter and the internal one with cotton[26,27]. Also, it was suggested that the mask be washed with soap and water instead of the bleach solution. Washing the mask with soap and water is as effective as cleaning with bleach and can increase adherence to this practice[28].

In this study, it was decided to evaluate the degree of content validity evidence by calculating the CVI, as this index has been used by most studies as an analysis calculation for evidence of content validity, but the CVI presents as a limitation the potential to boost agreement between the judges[15]and, for this reason, we chose to only accept the message as valid when it reached a value of CVI > 0.90, an index higher than that found in most studies, in which they use CVI > 0, 80 as satisfactory[29,30].

Based on the results obtained, it was possible to continue this project to evaluate the effectiveness of these messages in adherence to preventive measures against COVID-19. As

a limitation of the study, there is a lack of analysis of the understanding, clarity of information and appearance of the messages by the target population.

CONCLUSION

Eighteen messages were developed regarding the use of masks, hand hygiene and social distancing and these achieved adequate content validity evidence. It is believed that such messages can be an educational tool that can contribute to improving adherence to preventive measures against COVID-19 for the general population, aiming to reduce the incidence of cases and, consequently the number of hospitalizations and mortality.

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Authorship contribution:

Project administration: Vinicius Lino de Souza Neto, Vinícius Batista Santos, Juliana de Lima Lopes.
Conceptualization: Vinicius Lino de Souza Neto, Camila Takao Lopes, Alba Lucia Bottura Leite de Barros, Mônica Taminato, Vinícius Batista Santos, Juliana de Lima Lopes.
Data curation: Vinicius Lino de Souza Neto, Juliana de Lima Lopes.
Writing – original draft: Vinicius Lino de Souza Neto, Vinícius Batista Santos, Juliana de Lima Lopes.
Writing – review & editing: Camila Takao Lopes, Alba Lucia Bottura Leite de Barros, Mônica Taminato, Vinícius Batista Santos, Juliana de Lima Lopes.
Investigation: Vinicius Lino de Souza Neto, Camila Takao Lopes, Alba Lucia Bottura Leite de Barros, Mônica Taminato, Vinícius Batista Santos, Juliana de Lima Lopes.
Methodology: Vinicius Lino de Souza Neto, Camila Takao Lopes, Alba Lucia Bottura Leite de Barros, Mônica Taminato, Vinícius Batista Santos, Juliana de Lima Lopes.
Resources: Vinicius Lino de Souza Neto.
Supervision: Vinícius Batista Santos, Juliana de Lima Lopes.
Validation: Vinicius Lino de Souza Neto, Vinícius Batista Santos, Juliana de Lima Lopes.

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Corresponding author:

Juliana de Lima Lopes
E-mail: juliana.lima@unifesp.br

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