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Validation and usability assessment of a mobile application on first aid for children for professionals in basic education

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Abstract:

BACKGROUND: In the school environment, the need to perform first aid is common to meet the different demands presented by children. For this, education professionals need to be trained. The versatility of mobile applications in the learning process stands out among the qualification possibilities. The aim of the study was to validate the content, and appearance and evaluate the usability of a mobile application on first aid for basic education professionals.

MATERIALS AND METHODS: This methodological study was conducted virtually throughout Brazil, between September 2023 and April 2024. Content and appearance were validated by specialist experts (doctors [*n* = 10] and nurses [*n* = 24] working in pediatrics), using the Health Educational Content Validation Tool and the Health Educational Technology Appearance Validation Tool, and the usability was assessed with the target audience using the System Usability Scale. To test validity, a minimum agreement rate of 80% was adopted. Usability items with more than 75% of responses were considered satisfactory.

RESULTS: Content and appearance validation was performed by 34 experts; in content validation, of the 14 items evaluated, 11 had the Content Validity Index per item (I-CVI) ≥ 0.91. In appearance validation, all items were evaluated with I-CVI ≥ 0.94. The total CVI was 0.93. A total of 109 primary education professionals conducted a usability evaluation, and they considered that 100% of the nine items were evaluated as satisfactory.

CONCLUSION: The app "*Criança and Cuidado - Aprenda primeiros socorros*" (Child and Care - Learn first aid), which aims to teach first aid to primary school professionals, was considered valid in terms of its content and appearance. It showed good usability and satisfaction among the target audience.

Keywords:

Accidents, child health, first aid, mobile applications, validation study

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Introduction

Accidents involving children are common in the school environment and require qualified personnel to provide first aid. The high risk of accidents among children is associated with development, experience, and behavior, leading to greater vulnerability to unintentional injuries, especially in recent years, due to the increased inclusion of disabled children in schools, who are more likely to have accidents. In the global context, child and adolescent mortality affects around 6.2 million children, with 1.2 million deaths due to preventable causes.[1] In Brazil, 1 in every 10 pediatric emergency care visits

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is due to external causes.[2] Schools are the settings in which children spend a considerable amount of their lifetime due to educational activities. As such, it is a public health problem that causes notable costs to the health system and harm to children and their families, through hospital admissions, rehabilitation treatments, coping with sequelae and deprivation in social life, as well as the associated emotional impacts, in addition to the deaths it causes.[3] The need to minimize these problems is essential. To do so, it is necessary to coach adults who live with children, such as family members, caregivers, and teachers. The process of learning how to prevent and act in first-aid situations is important, and such actions should be carried out in all spaces where children move around, such as the school environment. A study found that early childhood education professionals have limited knowledge of first aid.[4] Actions are therefore needed to teach and train basic education professionals in first aid to make the environment safer. Information and Communication Technologies, through the use of mobile devices and their versatility, are among the various learning methodologies.[5] Studies have identified that the use of mobile applications (apps) improves adherence and overcomes barriers to health care, as well as digital interventions, thereby having a positive impact and promoting behavior change in relation to health in different contexts.[6,7] The aim of the "*Criança and Cuidado - Aprenda Primeiros Socorros*" (Child and Care - Learn First Aid) app is to provide training on first aid in the school environment.

The "*Criança and Cuidado - Aprenda Primeiros Socorros*" (Child and Care - Learn First Aid) app aims to provide training on first aid in the school environment and enable the recording of accidents that occur in this setting. One study identified accidents such as falling and foreign body ingestion as among the main causes of hospitalization in children and concluded that nursing professionals could develop strategies based on the data presented, such as outreach programs, focusing on risk factors, and taking safety and prevention measures.[8] A scoping review identified that despite the growth in research using health apps, a small proportion of these studies carry out usability evaluation.[9] There are some apps with guidance on first aid for children, for example: BabyBus®, First Aid Red Cross®, First Aid®, and iFirstAid®, available in the Google Play app library; however, these do not specify the main accidents in schools and do not generate notifications and data on accidents. Given this context, this study aimed to validate and evaluate the usability of a mobile application on first aid for professionals in basic education.

Materials and Methods

Study design and setting

This was a methodological study to validate the mobile application "*Criança and Cuidado - Aprenda Primeiros Socorros*" (Child and Care - Learn First Aid), the purpose of which is to train school professionals in first aid for children (2–10 years old) and make it possible to record accidents that have occurred. The age range was set so that first aid instructions for choking and cardiopulmonary arrest could be given to children according to their age. The app consists of three *moblets*: the first one contains a home screen with important contacts for first aid services (Mobile Emergency Care Service - SAMU - 192, Fire Brigade – 193, and Military Police - 190), followed by two other *moblets* ("Learn first aid" and "Register the accident here"). A technical team of graphic design professionals, software engineers, and researchers developed the app using the User Centered Design (UCD) method. A theoretical framework is shown in Figure 1. The mobile application is registered in Brazil at the National Institute of Intellectual Property (INPI- 512024001169-2).

Data were collected virtually, in different states of Brazil, with a non-probabilistic convenience sample, between September 2023 and April 2024. Participants were selected on the recommendation of researchers from the Child Health Research Group, who provided the names and contacts of eligible professionals for the study. The application was validated using the Delphi technique. The process of running questionnaires using this technique ends when the desired levels of stability and consensus in the responses are reached[10] and consists of two stages: validation of content and appearance and evaluation of usability. The data collection instrument was sent via email and messaging applications, using Google Forms®, with detailed information on the scope of the application, the research objectives, and the link/QR code to access the application, followed by the sociodemographic and professional characterization of the participants, validation of the content and appearance, as well as usability evaluation. At the end of the tools, a blank space was made available for suggestions and comments aimed at improving educational technology.

Study participants and sampling for validation of the app's content and appearance

The content and appearance were validated by experts divided into two groups. Group A: doctors or nurses with a postgraduate degree of specialization or residency in pediatrics; and at least 1 year experience in pediatric emergency care. Group B: teachers/researchers based on identification in the Directory of the National Council for Scientific and Technological Development (CNPq) of research groups that study and publish on first aid in pediatrics, on technology validation, and who had a minimum of five points, as shown in Table 1.

The Instrument for the Validation of Educational Content in Health (IVECH) was used. It has 18 items

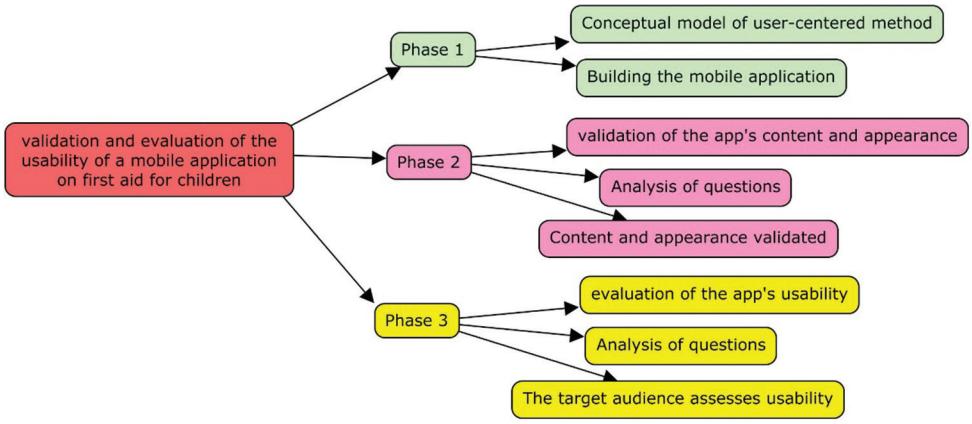

Figure 1: Stages for validation and evaluation of the usability of a mobile application on first aid for children

Table 1: Criteria for selecting teaching and research experts

CRITERIA	
Thesis/dissertation in the field of technology validation	2 points/work
Thesis/dissertation in the field of Pediatrics or First Aid	1 point/work
Published work in the field of technology validation	2 points/work
Published work in the field of Pediatrics or First Aid	1 point/work
Participation in research in the area of technology validation	2 points/research
Participation in research in the area of Pediatrics or First Aid	1 point/research
Participation in groups in the area of interest*	1 point/year
Teaching practine in the área of interest*	2 points/year
Professional practine in the área of interest*	1 point/year

*Area of interest: First Aid and Pediatrics

and 3 domains (objectives, structure/presentation, and relevance) which assess respectively: purposes, goals or aims; organization, structure, strategy, coherence and sufficiency; significance, impact, motivation, and interest. The IVECH uses a Likert-type scale with three levels of judgment: inadequate, partially adequate, and adequate.[11]

In addition, the Instrument for Validating the Appearance of Educational Technologies in Health (IVAETH) was applied with 12 questions related to the layout of the application and with five levels of judgment: totally disagree, disagree, partially disagree, agree, and totally agree.[12] It should be noted that the next stage consisted of adapting the final version of the application's content, based on the experts' suggestions.

Study participants and sampling for evaluation of the app's usability

Professionals with basic education conducted the usability evaluation. The inclusion criteria were working in an institution with basic education (early childhood education or primary education). The exclusion criteria were not having familiarity with the use of mobile application technology and not having communicated with the researchers in charge for more than 30 days when asked to contact them.

The System Usability Scale (SUS)[13] was used in a translated and validated Portuguese version. The SUS is a 10-statement scale, in which the participant assigns a score on a Likert scale according to their degree of agreement or disagreement. Thus, they can choose between the following answers: strongly agree, agree, neutral, disagree, and strongly disagree. The scale features affirmative declarative sentences (odd-numbered questions) alternating with negative declarative sentences (even-numbered questions) to prevent some bias during the response collection. In our study, item 8 (I found this system too heavy to use) was excluded, as it was not necessary to download the app at the time of collection.

Data collection tool and technique

The data were transferred from Google Forms to a Microsoft Office Excel 365® spreadsheet and run on the Statistical Program for Social Sciences® (SPSS) version 24.0. Descriptive analysis was conducted to check absolute and relative frequencies and the mean and standard deviation for continuous variables with normal distribution, using the Shapiro–Wilk statistical test. In the validation of content and appearance, the analysis of agreement between the experts was based on the Content Validity Index (CVI), which identifies the proportion of experts who agreed with an item. CVI per item (I-CVI) $\geq$ 0.80 or 80% (binomial test, with a significance level of $P < 0.05$) and total CVI $\geq$ 0.90 or 90% were considered valid.

The SUS scale data analysis and interpretation were considered satisfactory when there were more than 75% of "totally agree" or "agree" responses for the affirmative declarative sentences (odd-numbered questions) and more than 75% of "totally disagree" and "disagree" responses for the negative declarative sentences (even-numbered questions).

Ethical considerations

The project was submitted to and approved by the Research Ethics Committee, under opinion number 6.065.435. All participants agreed to the Free and Informed Consent Term (FICT) and data confidentiality and anonymity were guaranteed.

Results

One round of data collection was necessary for all the participants in the survey to validate the content and appearance and assess usability. A total of 34 specialist experts, including doctors and nurses specializing in pediatrics, validated the content and appearance, the majority (79.4%) were females, mean age of 41 ± 8 years. In terms of professional characterization, 61.8% were Group A experts and 38.2% were Group B experts. Half of the experts (50%) worked in pediatric care and all had postgraduate degrees.

Concerning the content validation, Table 2 shows the response results to the adequate and partially adequate items (positive responses). The total CVI for evaluating the application was 0.93. Table 3 shows the items used to validate the appearance and their respective CVIs.

All experts who disagreed with an item had to specify why. Table 4 describes the main suggestions made by the experts in each *moblet* of the application.

For the usability evaluation, 109 professionals from Early Childhood Education and Primary Education took part, the majority of whom were teachers - 64 (59%), followed by Child Development Assistants (CDA) - 18 (16%), administrative secretaries - 9 (8.3%), lunch ladies - 8 (7.3%), school management staff - 5 (4.6%), and janitorial staff - 4 (3.7%). There was a predominance of females (91.7%), mean age 45 ± 10 years. Also, 72 (66%) worked in a public institution and 37 (34%) in a private service. Concerning the length of service, the majority (34, 31.2%) had been working for more than 10 years.

Figure 2 shows the answers to the affirmative declarative sentences on the SUS scale. It shows that in all the odd-numbered questions, the highest percentage of responses is in the "agree" and "totally agree" items, which is considered satisfactory. Especially in the questions "*I found this system easy to use*" - 104 (95.4%) and "*I imagine that most people can learn to use this system quickly*" - 103 (94.5%).

According to Figure 3, the negative declarative sentences of the SUS scale showed more than 75% of "totally disagree" and "disagree" answers, which is considered satisfactory, especially in the questions "*I found this system unnecessarily complex*" - 98 (55 + 43)- 89.9%, "*I found that I would need help from a technical person to be able to use this system*" - 91 (46 + 45)- 83% and "*I found the system to be very inconsistent*" - 98 (43 + 55)- 89.9%.

Immediately after the closed questions on the SUS scale, there was a space to record suggestions regarding the app, as shown in Table 5.

Discussion

The content and appearance of the "*Criança and Cuidado - Aprenda Primeiros Socorros*" (Child and Care - Learn First Aid) app was validated by experts in the field of children's health and was evaluated by the public of interest (basic education professionals),

Table 2: Experts' agreement on the evaluation of the content of the mobile app (*n*=34). Salvador, Brazil. 2024

Variables	Adequate *n* (%)	Partially adequate *n* (%)	I-CVI	*P*
Objectives*				
1. Contemplates the proposed theme	32 (94)	2 (6)	0.94	0.995
2. Appropriate to the teaching-learning process	32 (94)	2 (6)	0.94	0.995
3. Clarifies doubts about the topic addressed	33 (97)	1 (3)	0.97	0.999
4. Encourages a change in behavior	29 (85)	5 (15)	0.85	0.838
Structure and presentation**				
5. Appropriate language for the target audience	31 (91)	3 (9)	0.91	0.977
6. Language appropriate to the educational application	31 (91)	3 (9)	0.91	0.977
7. Correct information	28 (82)	6 (18)	0.82	0.700
8. Objective information	32 (94)	2 (6)	0.94	0.995
9. Necessary information	31 (91)	3 (9)	0.91	0.977
10. Logical sequence of ideas	34 (100)	-	1.00	1.000
11. Appropriate text length	28 (82)	6 (18)	0.82	0.700
Relevance***				
12. Stimulates learning	33 (97)*	-	0.97	0.999
13. Contributes to knowledge in the field	34 (100)	-	1.00	1.000
14. Raises interest in the subject	33 (97)	1 (3)	0.97	0.999

*Purposes, goals, or objectives. **Organization, structure, strategy, coherence, and sufficiency. ***Significance, impact, motivation, and interest

Table 3: Experts' agreement on the evaluation of mobile app's appearance (*n*=34), Salvador, Brazil. 2024

Variables	Score *n* (%)*	I-CVI	*P*
1. The illustrations are suitable for the target audience	32 (94)	0.94	0.995
2. The illustrations are clear and easy to understand	33 (97)	0.97	0.999
3 - The illustrations are relevant to the target audience's understanding of the content	32 (94)	0.94	0.995
4 - The colors of the illustrations are appropriate for the type of material	32 (94)	0.94	0.995
5 - The shapes of the illustrations are appropriate for the type of material	33 (97)	0.97	0.999
6 - The illustrations portray the daily life of the intervention's target audience	32 (94)	0.94	0.995
7 - The picture layout is in harmony with the text	33 (97)	0.97	0.999
8 - The pictures used to elucidate the content of the educational material	33 (97)	0.97	0.999
9 - The illustrations help to explain the theme and are in a logical sequence	33 (97)	0.97	0.999
10 - The number of illustrations in the educational material is adequate	32 (94)	0.94	0.995
11 - The illustrations are in adequate sizes in the educational material	32 (94)	0.94	0.995
12 - The illustrations help to change the of the target audience's behavior and attitudes	31 (91)	0.91	0.977

*Score 4 on the Likert scale represents the "Agree" option and score 5, the "Totally agree" option

Table 4: Experts' suggestions for each moblet in the app

Order	Description of moblet	Experts' main suggestions
1st	Important contacts	Insert guardianship council contact
2nd	Learn first aid	-Cardiorespiratory arrest (Assess breathing before starting compressions; specify conduct in trauma situations). -Choking (specify that choking is na event resulting from airway obstruction). -Fainting and seizures (need to refer the child to a medical servisse to investigate the cause and prevent further events)
3rd	Register the accident here	No suggestions

Table 5: Suggestions from school professionals when evaluating the app's usability

Order	Description of moblet	Experts' main suggestions
1st	Important contacts	-Include a link to the contacts to make the call directly through the app.
2nd	Learn first aid	Add a voice assistant, explaining what is written. -Add more explanatory vídeos. -Do not need internet to open the vídeos, some places in schools have limited internet. -Extend the app to the children's families.
3rd	Register the accident here	No suggestions.

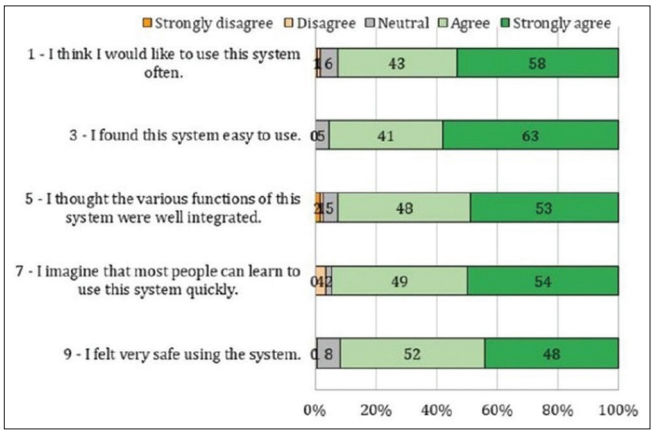

Figure 2: Agreement of affirmative declarative sentences of school professionals in the System Usability Scale

enabling the building of scientific technology that can contribute to learning first aid for children in the school environment. Technologies are becoming increasingly widespread and bring advantages as educational tools because they enable the portability of teaching objects, easy access to information, cost efficiency, broad applications, and time savings.[14]

The *"Criança and Cuidado - Aprenda Primeiros Socorros"* (Child and Care - Learn First Aid) app was developed to work offline, except when the accident is registered on the "Register the accident here" *moblet*. Due to Brazil's geographical distribution and the difficulty in accessing emergency services for pediatric care, it is common for schools to be located in areas without an internet signal, especially those that provide service for children in traditional communities, such as indigenous, *quilombola*, and in social vulnerability situations. Therefore, technology can benefit children in different locations who may occasionally have difficulty accessing health services, for which first aid is essential. Low socioeconomic status is a risk factor for accidents in children.[15]

In addition to these contributions, the app was built to meet the needs of the target audience. It was validated by health professionals, and later its usability was tested by school professionals. A literature review analyzed 133 studies on health apps and found that the majority (78.62%, *n* = 103) used only one type of user as a participant, with a higher proportion represented by patients or caregivers. Given this, the authors emphasize the need for evaluation by professionals in the areas that underpin the technology, even if the target audience considers it to be appropriate.[9] Concerning content

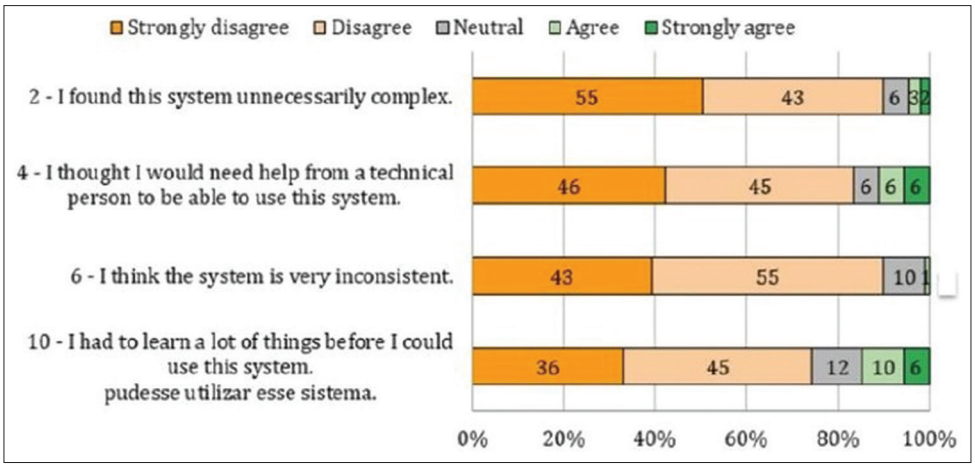

Figure 3: Concordance of negative declarative sentences in the System Usability Scale

validation, the authors found that the majority of apps used only one type of user.

Concerning content validation, it was found that in the objectives item: purposes, goals, or aims, the app had a high agreement rate in all items; however, in the sub-item encouraging behavior change, it had a lower I-CVI = 0.85. Some experts have described that behavioral modifications cannot be carried out solely with the app's guidance, as school professionals must participate in face-to-face training and practical stations, in addition to using the app as support. The study found that using a mobile app provides effective feedback on learning.[16]

According to Georgiou *et al*.,[17] training in basic life support improves children's survival rates in the school environment. A study carried out in Ethiopia found that kindergarten teachers with previous training in first aid were three times more likely to have knowledge and action compared to those who had no training.[18] It is worth noting that the "Child and Care" app aims to strengthen the teaching-learning process on first aid; however, its use should be complementary to other strategies such as practical and periodic courses with school professionals.

In the content validation, in the structure and presentation item (organization, structure, strategy, coherence, and sufficiency), of the seven sub-items evaluated, five had an I-CVI > 0.90, and two had an I-CVI = 0.82. As for the sub-item: "correct information and adequate text size," there were suggestions from the experts to adjust the information on cardiopulmonary arrest and the extrication maneuver; all the suggestions that the researchers considered pertinent were accepted. The explanatory video covered cardiopulmonary resuscitation for laypeople, according to the American Heart Association's chain of survival, which explains the rescuer's proper position, the frequency, depth, and positioning on the child's chest where compressions should be applied. A study validated an educational video on cardiopulmonary arrest (CRA) for laypeople and concluded that it is a viable technological resource that can be used by nurses in health education.[19]

With regard to the video on the choking maneuver, there was a suggestion to adjust the concept of choking. There are a few studies on programs aimed at reducing choking injuries. A randomized clinical trial with 1,426 participants (family members and school professionals) used guidance on choking in children as an intervention and concluded that the guidance given to school teachers to be passed on to family members was more effective than the intervention given directly to family members.[20] This reinforces the fact that teachers can disseminate the knowledge acquired from the app to children's families, which extends safety to other environments such as their homes.

A study carried out in Portugal with family members of children aged 5 to 9 years identified a lack of knowledge about first aid and concluded that there is a need to create a health education program for parents and caregivers about first aid in children, to be promoted in health institutions and schools. Health professionals, such as nurses, pediatricians, and other members of the multi-professional team, have a fundamental role in guiding first aid in the event of accidents and can contribute to reducing child morbidity and mortality.[21] The intention is to extend the app's use by children's families, spreading information and a culture of safety.

The app aims to strengthen the first aid learning process provided appropriately. Thus, in the item on the necessary information (I-CVI = 0.91), it was suggested that in fainting and seizure cases, the need to refer the child to a medical service to investigate the cause and prevent further events should be added. An in-hospital study

conducted in China evaluated children with fainting and activities similar to seizures and found that during these events, the children showed serious hemodynamic changes.[22] This reinforces the need to provide guidance to school professionals on referring children to the emergency department after first aid has been given.

In the validation of the content related to the item relevance: significance, impact, motivation, and interest, the items "Stimulates learning" (I-CVI = 0.97), "contributes to knowledge in the area" (I-CVI = 1), and "arouses interest in the topic" (I-CVI > 0.97) obtained the highest levels of agreement. These data are similar to those of the study that validated the CRA video for deaf people.[20] Studies have identified that elementary school teachers have limited knowledge of first aid and feel anguish, fear, and concern when faced with first aid situations.[4,5] This insecurity may be due to a lack of preparation for dealing with emergencies, which may arouse interest in the subject among the target audience. Thus, the validated technology can contribute to the education professionals' self-confidence to provide first aid and promote children's health.

In the appearance validation, all the items scored I-CVI > 0.90. The experts considered the importance of the video for the target audience's learning. Evidence affirms that videos can stimulate and hold people's attention and achieve positive results in terms of changing behavior.[23,24] A randomized controlled clinical trial conducted in pre-schools used a mobile app as an intervention on accidents in children and found that there was a significant improvement in caregivers' behaviors.[25] The study results were positive.

Thus, after making adjustments to the app based on the experts' suggestions, we proceeded with the usability evaluation, which is an important parameter for evaluating apps to check the interface and improve the user's impression because dissatisfaction with the use of an app can lead to the target audience's inadequate impression and an app user withdraw.[13]

Authors have found that the majority of studies that have validated mobile applications for health education have assessed usability using questionnaires and the SUS scale, which made it possible to assess the following usability attributes: effectiveness, efficiency, and satisfaction.[26,27] Therefore, it is possible to measure the user experience, which is individual, using instruments such as scales.

Given this, there is a shortage of validated instruments for evaluating technologies' usability in the health context, which is an area with specific characteristics and with growing care production, management, and educational technologies,[28] and a gap has been identified in the of instruments for this purpose, which would contribute to increasing the reliability of technologies and consequently strengthening work processes in different dimensions.

The "*Criança and Cuidado - Aprenda Primeiros Socorros*" (Child and Care - Learn First Aid) app was positively evaluated by the target audience, who also submitted comments to improve the technology, which were analyzed by the research team. It is important to focus on the user in all the processes leading up to the app's validation,[29] from its planning and construction to interface development and use and functionality testing so that the technology provides the most beneficial result possible and corresponds to the user's requirements in their context of use, in this study the school environment. A study using an app identified an important issue that persists after developing and implementing such technologies to study the population's satisfaction with this tool.[30]

School professionals rated the application as satisfactory in all the positive question items, with more than 80% answering "Agree" and "Strongly agree." In line with this, a virtual training program for accident prevention in children was rated positively by the lay public.[31] In the negative declarative questions, the majority of responses for all items were related to "disagree" and "strongly disagree," which reinforces satisfaction with using the app.

The app has several *moblets* and describes each type of accident in different tabs, even though it is easy to understand what is written in the app, there were reports of little familiarity with cell phone use and internet access. Although Brazil is a country with a high number of people using cell phones, there is still a digital gap that affects a considerable portion of our population. A study conducted with the Iranian population identified that improving digital literacy requires people to have high levels of adaptation to their lifestyle and needs, including increasing user skills in adapting to the application, the prevalence of applications used by users, and the adaptation of sports services to user needs, increased the likelihood of accepting applications.[32]

After analyzing the data from the usability assessment, it became clear that the application was a relevant educational strategy and that users found the system easy to use, which is fundamental for motivating school professionals to get involved in learning. Schools are a privileged environment for carrying out health education interventions.[33] Thus, studies have identified that evaluating usability using a satisfaction survey allows for greater knowledge about mobile application use in healthcare.[34] Another suggestion made during the

usability assessment was to expand information on first aid beyond school professionals to these children's families. This suggestion will be taken on board in the future after the families have been assessed.

The validated educational technology has innovative potential, was developed by a nurse, and can be used by the school staff. It was produced in plain language and can be installed on cell phones free of charge. The internet will only be needed to download the application onto the mobile device and at the time of notification, after the accident has occurred, to store the information in the database, which is on the "Register the accident here"*moblet*.

The records will be stored in the app's database, which will be made available to school management, which could track and manage the injured children's health more easily. A study conducted in South India identified that among the most important factors for the use of patient records in a mobile application are the efficient use of time and effort, easy retrieval of records, and automatic generation of reports,[35] and could serve as a basis for future research on the subject. The data obtained from the application will help in teaching preventive measures for accidents in children, both for the school population and for the general population. These instructions can be disseminated in various ways, including on social media. A study found that social media is a quality tool for health dissemination, with variable content that is applicable to teaching and that its use can be applied both in the training of health professionals and in promoting the health of the population.[36]

Limitations and recommendations

The study's limitations include the fact that it does not have a language for the deaf and mute; so, it does not address inclusive digital health. Concerning the implications for the advancement of scientific knowledge for health, the app is intended to be made available to management bodies in municipalities and states and disseminated nationally and internationally. Studies are suggested to validate other educational technologies that contribute to child health and research that evaluates the effectiveness of the application validated in this study.

Conclusion

The smartphone app "*Criança e Cuidado - Aprenda Primeiros Socorros"* (Child and Care - Learn First Aid) aims to help basic education professionals act and report accidents in the school environment. Its content and appearance were considered valid by the experts and it showed good usability and satisfaction among the target audience; aspects that could be improved in future solutions were identified.

The app aims to reduce complications in children, resulting from inadequate first aid, and strengthen scientific progress and social transformation in children's lives. With the statistical data generated through the notification of accidents that occur in schools and their outcomes, the use of the app will strengthen the National Policy for Comprehensive Child Health Care and the School Health Program. It also aims to contribute to the digital health strategies for 2020-2028, which aim to guide and align activities to strengthen and transform digital health in Brazil.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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