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Construction and validation of an instrument to assess the risk of suicide in Emergency and Psychosocial Care services

Construção e validação de um instrumento para avaliar o risco de suicídio nos serviços de Atendimento de Emergência e Psicossocial

Construcción y validación de un instrumento para evaluar el riesgo de suicidio en los servicios de Atención de Emergencia y Psicosocial

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Abstract
This article aimed to build and validate a protocol to be inserted into software to assess suicide risk, being a methodological development study carried out in three stages. In the first stage, the content was validated, through 5 judges, who were experts who work in teaching and research in the area of mental health and suicidology. After validating the content (protocol), the second stage was carried out, which consisted of the construction of the software by IT professionals. In the third stage, the software was validated in terms of applicability and usability. The study invited 19 participants, 17 professionals who work in the health network (urgency/emergency and mental health) of a municipality located in the north of the Minas Gerais triangle and two experts in the Information Technology (IT) field, who evaluated the interface and usability criteria. To validate all stages, participants used the Likert scale. The instrument obtained 80% agreement from judges regarding content, appearance, and consistency for assessing the risk of suicide in Emergency and Psychosocial Care services.
Keywords: Suicidal Behavior; Health services; Software.

Resumo
Este artigo teve como objetivo construir e validar um protocolo para ser inserido em um software para avaliação do risco de suicídio, sendo um estudo de desenvolvimento metodológico realizado em três etapas. Na primeira etapa, o conteúdo foi validado por cinco juízes, especialistas que atuam no ensino e pesquisa na área de saúde mental e suicidologia. Após a validação do conteúdo (protocolo), foi realizada a segunda etapa, que consistiu na construção do software por profissionais de Tecnologia da Informação (TI). Na terceira etapa, o software foi validado quanto à aplicabilidade e usabilidade. O estudo contou com a participação de 19 pessoas, sendo 17 profissionais que atuam na

rede de saúde (urgência/emergência e saúde mental) de um município localizado no norte do triângulo mineiro e dois especialistas da área de Tecnologia da Informação, que avaliaram a interface e os critérios de usabilidade. Para validar todas as etapas, os participantes utilizaram a escala de Likert. O instrumento obteve 80% de concordância dos juízes em relação ao conteúdo, aparência e consistência para avaliação do risco de suicídio nos serviços de Atendimento de Emergência e Psicossocial.
Palavras-chave: Comportamento Suicida; Serviços de Saúde; Software.

Resumen
Este artículo tuvo como objetivo construir y validar un protocolo para ser incorporado en un software para la evaluación del riesgo de suicidio, siendo un estudio de desarrollo metodológico realizado en tres etapas. En la primera etapa, el contenido fue validado por cinco jueces, especialistas que trabajan en la enseñanza e investigación en el área de salud mental y suicidología. Después de la validación del contenido (protocolo), se llevó a cabo la segunda etapa, que consistió en la construcción del software por profesionales de Tecnología de la Información (TI). En la tercera etapa, el software fue validado en cuanto a su aplicabilidad y usabilidad. El estudio contó con la participación de 19 personas, siendo 17 profesionales que trabajan en la red de salud (urgencia/emergencia y salud mental) de un municipio ubicado en el norte del triángulo de Minas Gerais y dos especialistas en el área de Tecnología de la Información, quienes evaluaron la interfaz y los criterios de usabilidad. Para validar todas las etapas, los participantes utilizaron la escala de Likert. El instrumento obtuvo un 80% de concordancia de los jueces en relación con el contenido, la apariencia y la consistencia para la evaluación del riesgo de suicidio en los servicios de Atención de Emergencia y Psicosocial.
Palabras clave: Comportamiento Suicida; Servicios de Salud; Software.

1. Introduction

Suicide is a complex and important issue in contemporary society. It has been studied by various fields of knowledge that seek to understand this social problem in human behavior. Studies point to various causes of suicide, making it necessary to establish preventive actions (Pirkis et al., 2024).

Taking your own life is one of the three main causes of death among people aged between 15 and 44. According to the World Health Organization (WHO), it is responsible for one million deaths every year (which corresponds to 1.4% of all deaths). These figures do not include suicide attempts, which are 10 to 20 times more frequent than suicide itself (World Health Organization [WHO], 2019).

In Brazil, since the 2000s, there has been a significant increase in suicide cases, worsened by the lack of government programs aimed at prevention. The study of this phenomenon is essential for developing public policies that address the issue and implement effective preventive strategies. Analyzing suicide data allows for the evaluation of existing monitoring and prevention processes, ensuring they are based on reliable information and evidence. Until 2016, mortality from self-inflicted causes was higher among men, particularly those aged 20 to 39 years, predominantly white, single, and with lower educational levels, with hanging being the most used method. This epidemiological pattern was consistent across the country, although variations were observed among mixed-race and Indigenous populations, influenced by geographic and demographic factors (Oliveira; Dutra & Fófano, 2024; Klann & Sousa, 2024).

Risk factors for suicidal behavior include a history of ideation at different levels, multiple attempts, non-suicidal self-harm, trauma, and impulsivity. In sociodemographic terms, men have more deaths by suicide, while women have more evidence. Young people and the elderly are more vulnerable groups (Pemau et al., 2024).

Research shows that most people who have attempted suicide communicate their intention, however, the warning signs are not noticed by family members or professionals (Teixeira, 2004). A WHO Multicenter Study of Intervention in Suicidal Behavior (SUPRE-MISS) (WHO, 2014) pointed out how careful handling of cases of suicide attempts can reduce the rate of actual suicides. Giving special attention to a person who has attempted suicide is one of the main mechanisms for preventing future suicide, and seeking meaning in life together with individuals (Botega, 2014).

Suicide risk assessments are carried out to classify individuals as *high risk, medium risk, or low risk*, with a view to

future suicidal behavior. This classification (stratification) is used to determine the allocation of follow-up care with the aim of preventing these behaviors. The high-risk stratum receives specific interventions (e.g. protected hospitalization, careful nursing observation [for people who are under observation], face-to-face or telephone follow-up, and identified community support) or more intense intervention (e.g. more frequent reviews in hospital and community settings). Risk stratification is widely practiced (Carter & Spitall, 2018).

Suicide risk analysis is intended to: a) recognize the reality of present suicidal ideation/planning; b) distinguish the severity of previous attempts and current suicidal ideation; c) recognize risk factors and protective factors; d) qualify social support; e) identify the presence of previous psychological disorder; f) determine therapeutic measures for underlying conditions; and g) ensure the subject's inclusion in mental health services (Del-Ben et al., 2017).

A study carried out in Taiwan showed that in the first year after a suicide attempt, the risk is higher for an actual suicide, and prevention measures should be implemented at all levels of health care, as these measures are extremely important for reducing the number of suicide cases (Sun & Long, 2013).

According to Santos and Neves (2014), in circumstances where there is a risk of suicide, the implementation of therapeutic measures comprises two stages: the first initial contact and the intervention itself. Firstly, it is necessary to create an initial therapeutic dimension, inserting a dynamic approach to the subject with a proposal to offer them treatment, and insertion in the therapeutic project involving the person, family, and/or people in their social life.

People with suicidal ideation/planning should always be referred for reassessment and follow-up in mental health services. Patients considered to be at low risk of suicide can be referred for follow-up in out-of-hospital services, but it is essential to ensure rapid admission to the service, with the possibility of frequent consultations and availability for unscheduled appointments (Del-Ben et al., 2017).

A study by Pavulans (2012) reinforces the importance of working with people at risk of suicide, their limitations in solving their problems, closely assisting them with their own limitations and frustrations, offering mental health care, support to re-establish self-control in the face of suicidal behavior, and supporting them in the search to rebuild meaning in their lives.

In view of the above, the aim of this study was to build and validate a protocol to be included in software for assessing suicide risk in Urgent and Emergency Care and Psychosocial Care services.

2. Methodology

This was a methodological study with a quantitative approach, also using the Likert Scale, which is used to quantify information that was previously only qualitative, through scores attributed by the participants, which can vary from total agreement to total disagreement in relation to the statements on the topic under study (Pereira et al., 2018), and which aimed to produce, validate and implement a digital technology, represented by a software program that would help health professionals in Urgency and Emergency and Psychosocial Care services to assess the risk of suicide.

The study was carried out in a municipality in the north of the *Triângulo Mineiro*. During 2020 and 2021, according to Epidemiological Surveillance data, there were 408 cases of attempted suicide due to exogenous intoxication.

Cases of attempted suicide that are received at the Emergency Care Unit are preferably referred to specialized Mental Health services, but when cases of attempted suicide arrive at other care facilities, they end up not being referred to open services (CAPS I, CAPS AD, CAPS I and the Multidisciplinary Mental Health Team).

The protocol was developed by the team of researchers (responsible for the project), made up of nurses (expertise in the field of suicidology/mental health and information technology), a psychiatrist, a social worker, a psychologist, an occupational therapist, a pharmacist, teachers, and professionals in the field of information and communication technology, with the aim of permeating the discussion of the most pertinent themes, according to current literature, as well as the work

process, so that it is possible to introduce ICT (Information and Communication Technology) into the service as a facilitator and no longer a merely bureaucratic procedure.

The protocol contained the sociodemographic data of users who will be assisted at risk of suicide in the Emergency Care and Psychosocial Care Unit, clinical data, suicide risk assessment (mild risk, moderate risk, and severe risk), and therapeutic measures to deal with the risk.

Expert judges working in teaching and research in the field of mental health and suicidology were eligible for the study and were responsible for the content validation stage. After validating the content (protocol), 19 judges were invited to validate the prototype (software), 17 of whom were professionals working in the health network (urgent/emergency and mental health) in the northern municipality of Triângulo Mineiro and two IT (Information Technology) specialists.

The study consisted of three stages, which are summarized in Figure 1: In the first stage, the content was validated by 5 judges, who were selected based on the criteria indicated (Table 1), and had access to the online form after reading the informed consent form and agreeing to take part in the study.

The judges were identified and selected by searching and analyzing their CVs on the Lattes platform of the National Council for Scientific and Technological Development (CNPq). According to the methodology created by Fehring (1987) and applied in other studies (Melo et al., 2011; Cucik, 2016; Santos, 2017), the judges will be included according to the scores in Table 1.

Table 1 - Classification of judges, adapted according to Fehring's criteria (1987).

Judges	Score
Doctor's degree	4 points
Master's degree	3 points
Publication in an indexed journal on the subject of interest to the study*	2 points
Specialization in the subject of interest to the study*	2 points
At least five years of clinical practice in the area of interest	2 points
Participation in a scientific event in the last two years on the subject of	1 point
Total	14 points

Note*: Area of interest of the study: Mental Health and suicidology. Source: Fehring (1987).

The judges answered affirmative sentences about the content (distributed in items) and indicated their assessment using a Likert scale, with the options: totally disagree; disagree; neither agree nor disagree; agree; totally agree. They had 15 working days to respond to the forms, from the time the e-mail was sent. If there was no response, the researchers contacted them again, giving them a further seven days. If there was no response, the judge was excluded from the study.

The second stage of the study involved the development of the software by the teachers and information technology (IT) professionals involved in the design of the study. To this end, the researchers met with the IT team and defined the desired format for the software, as well as the screen changes between each content of the suicide risk assessment.

The third stage was to validate the software. In this stage, health professionals (urgent and emergency/mental health) were selected through a convenience sample, where they evaluated the usability and suitability of the software in the work routine of the psychiatric emergency (ECU) and mental health. Also at this stage, IT professionals were invited to validate the

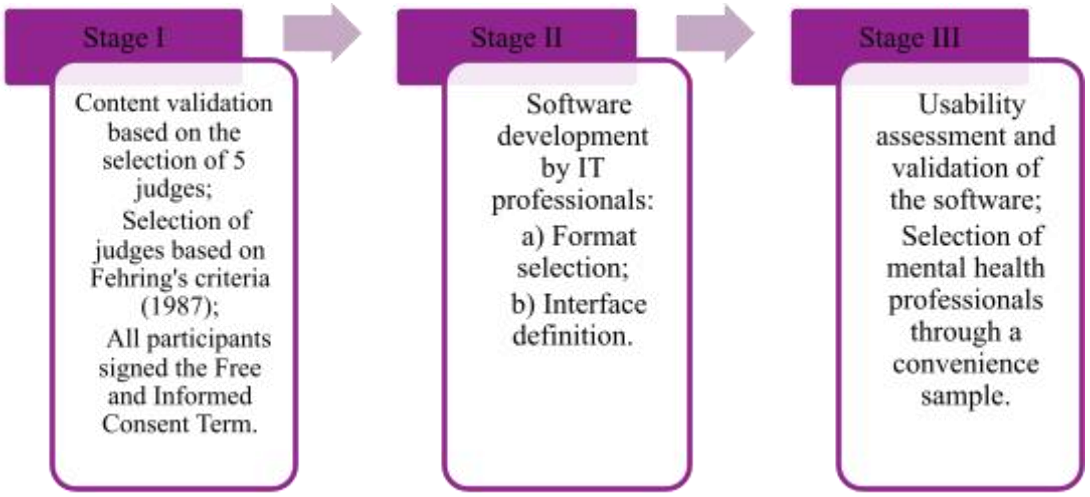
software, considering the same issues described above. To this end, in compliance with ethical precepts, the service users who took part in the software validation phase signed a FICT authorizing them to continue with the research.

The importance of the software being validated by professionals who provide care to users at risk of suicide is based on the fact that it enables an inclusive vision in the process of introducing ICT into the daily life of the health service, in order to strengthen comprehensive care and help conduct health care.

With regard to data processing, a quantitative analysis was carried out to assess the degree of agreement between the judges. This agreement was assessed using a minimum content validation index, commonly referred to as the Consensus Index (CI) or Favorability Index. Many studies adopt a CI of between 70% and 80%. However, in this study, we opted to establish a CI equal to or greater than 80%.

Below, Figure 1 shows the steps in software development:

Figure 1 - Summary of the software development stages**.**



Source: Authors (2023).

The study was carried out after approval by the IFSULDEMINAS Research Ethics Committee, under opinion no. 52997121.2.0000.8158. The judges were guaranteed anonymity and clarification of all stages of the research. Those who agreed to take part were asked to sign an FICT.

3. Results

Five judges contributed to the analysis of the instrument. As for the judges' profiles, all were female. In terms of education, all were nurses with a doctorate. Their main area of activity was research and teaching. Most of the judges had 10 years or more of professional experience, both in their training and in their work. In addition, the institution to which they were linked was entirely public.

The content validation procedure made it possible to capture the opinion of the experts in relation to the protocol presented in each characterization (sociodemographic and clinical), risk assessment, and therapeutic measures for each risk.

In the analysis of the first stage, the existence of agreement between the judges was verified, represented by the CI (reliability index) value of 100% about the content of the suicide risk assessment (Table 2).

In the subsequent phase of the study, the software was developed by teachers and Information Technology (IT) specialists. During this process, the need to reformulate some questions was identified, and the suggestions were incorporated.

As a result, the Concordance Index (CI) between the judges reached 90%.

The third stage was to validate the software's interface and usability. At this stage, it was presented to the Urgent/Emergency (ECU) and Mental Health (CAPS II, CAPS AD, and CAPSi) service teams in the municipality described, in which the judges agreed 100% on the items proposed in the protocol.

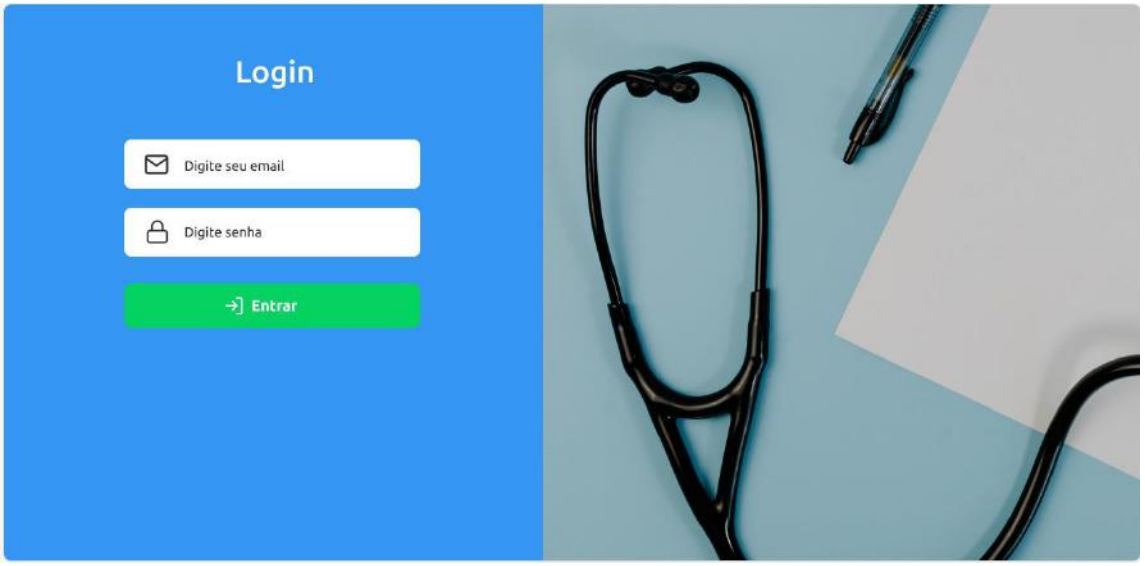
Through the content and appearance validation process, it was possible to obtain the experts' opinions on the indicators presented in each dimension, which served as a basis for revising the proposed items and indicators.

Table 2 - Interface and usability validation form - Google Forms, Passos, Minas Gerais – Brazil.

Regarding the process of validation and usability of the protocol through software for assessing suicide risk in an Emergency Care Unit (ECU) and Psychosocial Care (CAPS and CAPS AD) you:
Strongly disagree
Disagree
Neither agree
Nor disagree
Agree
Totally agree
Suggested changes:

Source: Authors (2023).

Figure 2 - User's login (Screen 01).

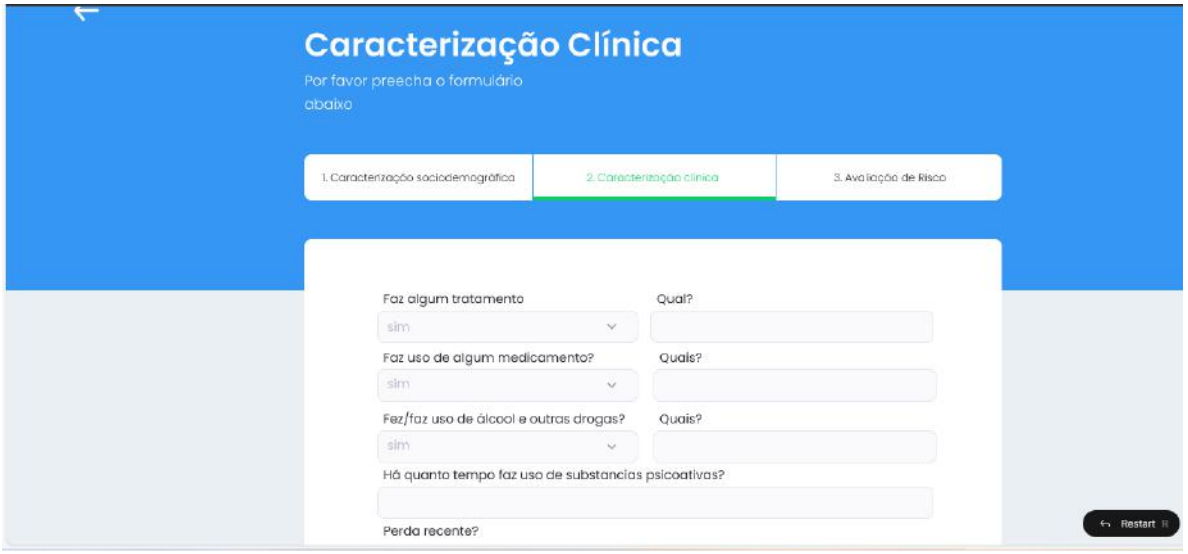


Note: The translation of the items comprising the figure: Login; Type your email; Type your password; Login. Source: Authors (2023).

Figure 3 - Sociodemographic characterization of CAPS and ECU users **(**Screen 02 - Part 1).

Note: The translation of the items comprising the figure: Name/logo; Sociodemographic characterization; Please fill in the form below; 1. Sociodemographic characterization; 2. Clinical characterization; 3. Risk assessment; Name on identity card; Social name; Mother's name; SUS card. Source: Authors (2023).

Figure 4 - Clinical characterization of CAPS and ECU users **(**Screen 03 - Part 1)



Note: The translation of the items comprising the figure: Clinical characterization; Please fill in the form below; Do you undergo any treatment, what is it? (Yes); Do you take any medication? Which ones? (Yes); Have you used alcohol or other drugs? Which drugs? (Yes); How long have you been using psychoactive substances?; Recent loss?. Source: Authors (2023).

Figure 5 - Assessment of Suicide Risk in CAPS and Emergency Care Units - ECU (Screen 04 - Part 1).

Note: The translation of the items comprising the figure: Risk assessment; Please fill in the form below; 1. Sociodemographic characterization; 2. Clinical characterization; 3. Risk assessment; All the questions are yet to be defined; Do you undergo any treatment? Yes, which one?; Do you take medication? Yes. Which one?; Do you or have you ever used alcohol/drugs? Yes. Which one?; How long have you been using substances?; Recent loss - Select one. Source: Authors (2023).

4. Discussion

After analyzing the data, it was found that the protocol (software) developed was validated for use in the assessment of suicide risk in the setting of Urgent and Emergency Care and Mental Health Services.

Health care assessment is based on the commitment of institutions and health professionals to follow the public policy guidelines established by the Ministry of Health. This includes respecting the specificities related to suicidal behavior and carrying out actions that emphasize health promotion and suicide prevention. In addition, it is essential to provide compassionate care, with attentive listening. Validation is therefore a crucial and indispensable stage in the process of developing an instrument for evaluation, as it allows us to verify the extent to which the elements incorporated are aligned with the theoretical framework on which the instrument is based, with the aim of making it possible to evaluate the phenomenon of interest (Souza et al., 2022).

The process of evaluating health care is based on the commitment of institutions and professionals to act based on the guidelines of public health policies recommended by the Ministry of Health, respecting the particularities of suicidal behavior and carrying out actions that prioritize health promotion and suicide prevention, as well as offering empathetic care and qualified listening. Thus, validation is an important and essential stage in the development of an instrument intended for assessment, as it makes it possible to verify the extent to which the items included correspond to the theoretical construction on which the instrument is based, to make it possible to assess the phenomenon of interest (Coluci et al., 2015).

The application of indicators related to health care has been considered fundamental for evaluating health services. In this context, this principle is used to assess the risk of suicide among people seeking urgent, emergency, and mental health care. This continuous assessment and risk analysis is crucial for suicide prevention and the effective promotion of mental health. The elements incorporated into the protocol are representative and pertinent, covering the phenomenon of suicidal behavior and suicide risk assessment comprehensively.

The judges involved in this study demonstrated in-depth knowledge and experience in the subject, covering areas such as practice, teaching, and research. Their valuable suggestions for modification enriched the instrument, making it more

sensitive and understandable in terms of the suicide phenomenon and context for which it has been developed.

The creation of indicators for the suicide risk assessment tool in urgent/emergency and mental health services is intended to produce innovative and relevant knowledge for planning interventions related to suicide prevention and support for people with suicidal behavior.

Health professionals' understanding and ability to identify the risk elements for suicide enable more effective intervention and assessment in the prevention of suicidal behavior. This is of great importance due to the multifactorial nature of suicide, which is influenced by a

complex interaction of personal, social, psychological, cultural, biological, and environmental factors (Souza et al., 2022).

Given that many people who attempt suicide need medical attention, it is essential to adopt an approach that allows the risk of suicide to be identified. Risk assessment has several important objectives. Firstly, it seeks to identify whether there are suicidal thoughts or plans at the moment (current suicidal ideation/planning). It also seeks to characterize the severity of previous suicide attempts and current suicidal thoughts. It is also essential to identify the risk factors and protective factors related to the individual in question, as well as to understand the nature of the social support available to them.

The assessment also seeks to determine whether there are any underlying psychiatric diagnoses that may be contributing to the situation. Next, it is important to initiate early therapy to address the underlying mental health conditions. Finally, ensuring that the patient is properly referred to mental health services is crucial to ensuring continuity of care and future prevention of suicidal behavior (Maia et al., 2022).

5. Final Considerations

The methodology employed played a fundamental role in the process of validating the instrument, especially in the context of suicide risk assessment. The participation and insights of the judges, representing different areas of activity, including care, management, research, and teaching, significantly enriched the process, adding a comprehensive theoretical and practical consensus in relation to the field of study. In addition, the interface validation and usability analysis ensured the instrument's reliability.

The combination of these two methods made it possible to create and validate an instrument to assess the suicide risk of users seeking mental health and urgent and emergency services. It is important to emphasize that the wide application of the instrument is necessary to allow continuous analysis of internal consistency, thus promoting its constant updating and improvement.

This approach will allow the instrument to be used to assess the quality of care for users seeking mental health and urgent and emergency care services. In addition, the instrument will play an important role in understanding the quality of care for these individuals and in supporting the formulation of public health policies aimed at suicidology.

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