Instruments for Assessing Suicidal Behavior Risk in Primary Care: A Scoping Review

Instrumentos para avaliação de risco de comportamento suicida na atenção básica: uma revisão de escopo

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ABSTRACT

A scoping review was conducted to identify and analyze instruments for assessing suicidal behavior risk in primary care, adopting the guidelines of Arksey and O'Malley and the PRISMA-ScR checklist. The search was performed in PUBMED, SciELO, MEDLINE, and Web of Science databases, with inclusion criteria covering the last five years. A total of 3,339 articles were initially selected and refined to 10 final studies. Tools such as ASQ, C-SSRS, and CASSY were identified; however, critical analysis revealed divergences in their effectiveness, highlighting both limitations and strengths. The results provide a comprehensive overview of the effectiveness and limitations of suicide risk screening tools in primary care, underscoring the necessity for judicious selection and adaptation of these tools to ensure effective screening. The heterogeneity of results emphasizes critical areas for future research and continuous improvement of clinical practices.

Keywords: Suicidal behavior. Primary health care. Risk assessment. Instruments. Psychometric scales.

RESUMO

Foi conduzida uma revisão de escopo a fim de para identificar e analisar os instrumentos de avaliação de risco de comportamento suicida na atenção básica, adotando as diretrizes de Arksey e O'Malley e a checklist PRISMA-ScR. A busca ocorreu nas bases PUBMED, Scielo, MEDLINE e Web of Science, com critérios de inclusão nos últimos cinco anos. 3.339 artigos foram selecionados na busca principal sendo refinados para 10 estudos finais. Ferramentas como ASQ, C-SSRS e CASSY foram identificadas, mas a análise crítica revelou divergências em sua eficácia, destacando limitações e pontos fortes. Os resultados fornecem uma visão abrangente sobre a eficácia e limitações das ferramentas de triagem de risco suicida na atenção básica, ressaltando a necessidade de escolha criteriosa e adaptação das ferramentas para garantir uma triagem eficaz. A heterogeneidade dos resultados destaca áreas críticas para futuras pesquisas e melhoria contínua das práticas clínicas.

Palavras-chave: Comportamento suicida. Cuidados de saúde primária. Avaliação de risco. Instrumentos. Escalas psicométricas.

INTRODUCTION

Suicide and suicidal behavior are universal phenomena observed in all regions and cultures. The perception of these topics varies according to different societies and eras. For example, in Japanese civilization, such an act is seen as a behavior of personal dignity and national pride, while in other groups, such as during the Romantic period, it was viewed positively when motivated by love. Regardless of the period and nation, the significant impact that suicide causes on individuals who were socially connected to the victims is undeniable[1].

Suicide is understood as self-directed aggression with the intent to cause death. Suicidal behavior represents a pattern of behaviors aimed at lethality, while suicidal ideation is the process of thinking about, considering, or planning suicide. Suicidal intent refers to the intention to end one's life, and preparatory behaviors for suicide involve acquiring instruments for the suicidal act, resolving pending issues, and farewells, among others. A *suicide attempt* is a non-fatal, potentially harmful behavior directed against oneself with the intention to die[2,3]. Suicide cannot be formally diagnosed as a health condition or mental disorder, being a human behavior with the intent to cause one's death[4]. However, it is relevant to highlight that there are mental disorders—such as depression, bipolar disorder, and borderline personality disorder— that increase the risk of suicidal behaviors and can be diagnosed and treated by mental health professionals[5,6].

The World Health Organization (WHO) reveals that in 2019, over 700,000 people died by suicide, representing one person every 40 seconds, making it one of the leading causes of death globally. However, the data have reliability biases since the understanding of suicide, its perception, religious practices, lifestyle habits, and methods of data collection and registration vary culturally[7].

The study by Verrocchio et al.[8] highlights that about 45% of people who commit suicide seek medical help in the month preceding the attempt, underscoring the critical importance of early identification and effective communication between healthcare professionals and patients. Understanding these patterns of help-seeking and identifying subtle indicators of suicidal ideation are crucial for developing more effective prevention and intervention strategies in this sensitive context. The study by Landa-Blanco et al.[9] adds an optimistic perspective, indicating that finding a reason to live, even amid great difficulties, acts as a significant motivator for continuing existence.

Some studies, such as that of O'Connor et al.[10], demonstrate the need for medical attention, evidencing a relationship between the irregularity of the Hypothalamic-Pituitary-Adrenal (HPA) axis caused by chronic cortisol release in stressful situations and susceptibility to suicidal behavior. The stress-diathesis model is also used to explain the possible reasons why an individual leans toward committing suicide, considering a biological basis (diathesis) and environmental stressors[11].

Suicide prevention strategies, as per Serrano and Dolce[1], are divided into three spheres: universal, selective, and individual. Universal interventions impact the population at a national level, selective interventions target vulnerable groups, and individual interventions focus on individuals with a history of suicide attempts or suicidal ideation. Training primary care teams to identify risk factors, intervene appropriately, and provide follow-up is essential in all spheres[13].

Suicide prevention in primary care in Brazil is challenging due to the lack of professional training. Studies highlight the need for more effective health actions, coordination between health services, and early detection of cases using risk assessment scales[14,15,16]. Other countries have improved prevention with training programs, standardized tools, and mental health promotion. In the USA, scales like the Patient Health Questionnaire - PHQ-9 for depression result in more effective interventions[17], although there are still gaps such as personalized approaches and integration between services[18,19]. Thus, continuous education and innovative technologies in screening need to be explored.

Mental health promotion is crucial, and programs for well-being, emotional resilience, and social support, including educational activities and campaigns, are indicated[20]. Integrating these initiatives with primary care

improves the effectiveness of interventions and preventive care, starting from childhood[21].

The COVID-19 pandemic has increased risk factors for suicide, highlighting the need for early identification strategies[18,19]. The validation of the Beck Depression Inventory (BHS) among adolescents has shown its efficiency[22]. Various scales for different populations, such as the State Anxiety Scale for Children (CSAS-C)[18] and the Center for Epidemiologic Studies (CES-DC) scale for child depression[25], improve early detection and patient management, reducing suicide attempts[3,13,19]. Other tools include the Beck Suicide Ideation Scale (BSS), BHS, and the Reasons for Living Scale (RLC21), despite challenges in measuring suicide risk due to social, historical, and medical factors, and depressive symptoms[22].

Given this panorama, this study aims to conduct a scoping review to identify and analyze instruments to assess suicidal behavior risk used in primary care. It highlights divergences in their effectiveness, limitations, and strengths.

METHOD

This study follows the guidelines of Arksey and O'Malley[23] for a scoping review, in addition to the PRISMA-ScR checklist by Tricco et al.[24] for reporting the research. The steps include (1) formulation of research questions; (2) search for relevant studies in the PUBMED, SciELO, MEDLINE, and Web of Science databases; (3) selection of studies with specific inclusion criteria; (4) analysis of the results; and (5) synthesis and presentation of the results.

The research question aims to identify instruments for assessing the risk of suicidal behavior in primary care with validity, reliability, sensitivity, and adaptability. The search involved terms like "suicidal behavior," "primary health care," "risk assessment," "instrument," and "psychometric scales" in English, Portuguese, and Spanish, covering publications from the last five years (2018 to 2023), using the Boolean operators "and" and "or." The bibliographic search was conducted between April and August 2023.

Data extraction was carried out through a protocol adapted from the Joanna Briggs Institute[25], using a pre-prepared spreadsheet containing the year, location, and journal; empirical or theoretical study; design and characteristics of participants in the case of empirical studies; main focuses involved in the research problem, arguments, and in empirical studies, methods, discussions, and limitations. Categories of analysis were developed for the theoretical studies, and two researchers extracted the data. Discrepancies were resolved by consensus meeting, and a third researcher was consulted when necessary. The researchers checked and reviewed the data, measuring the agreement coefficient between the analyses for study selection and data extraction.

The information was organized into summary tables, and the similarities and divergences of the studies were explored to highlight the effectiveness of the instruments.
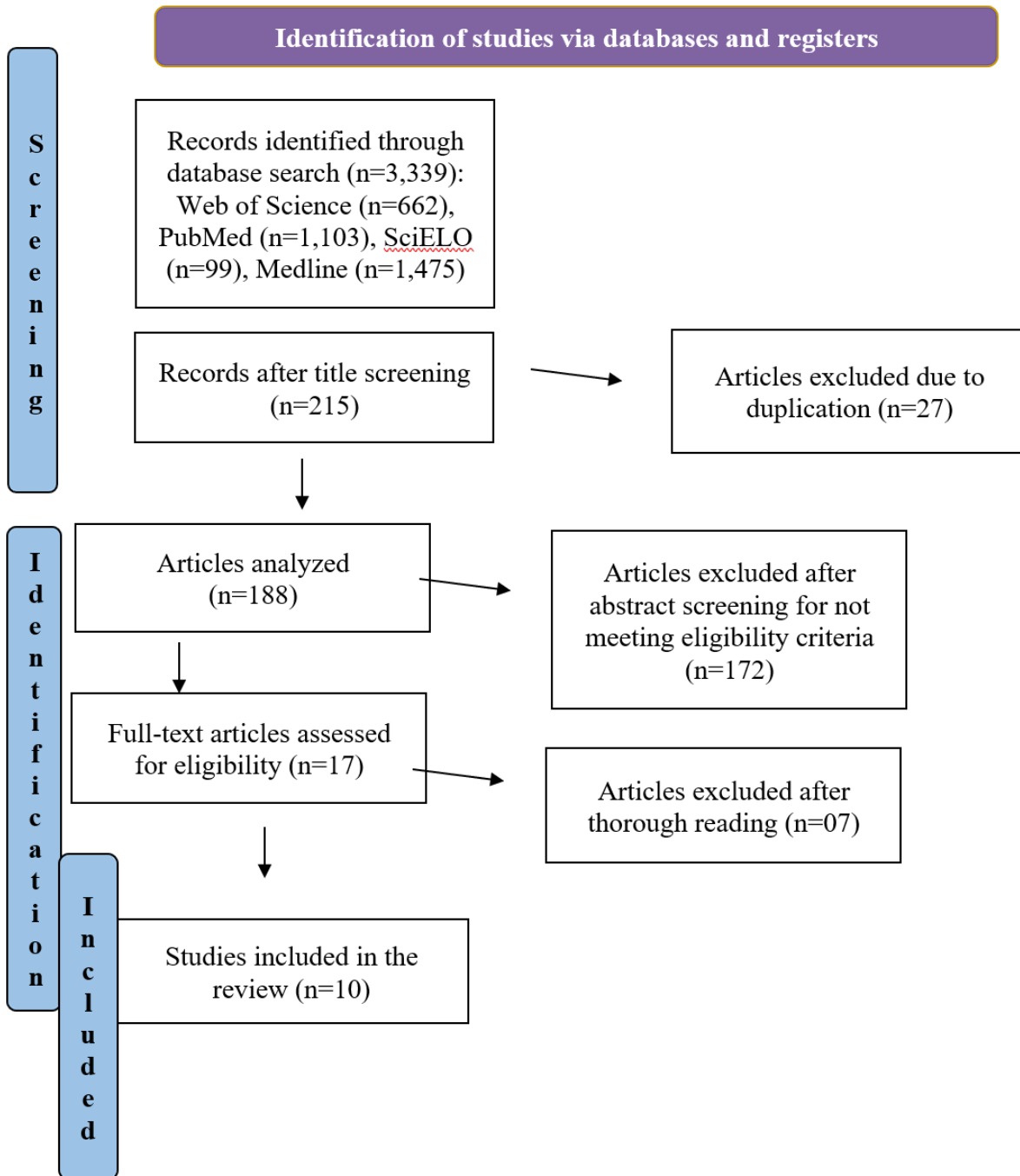
RESULTS

Figura 1 - PRISMA Flow Diagram (adapted) of the study selection process.
Source: Prepared by the authors (2024).

Table 1. Studies Included in the Scoping Review Addressing Instruments for Assessing the Risk of Suicidal Behavior in Primary Care

Identification	Objective	Method/Sample/ Instruments	Main Findings	Conclusion
1. Syndergaard, Borger, Klenzak, Grello, Adams (2023)	Evaluate the clinical burden associated with the implementation of universal suicide screening using the C-SSRS in an emergency department.	Retrospective cohort. N＝10,197 adult patients seen in the emergency department. Comparison of length of stay for psychiatric evaluations pre- and post-C-SSRS screening.	The incidence of psychiatric evaluation was 18% higher after screening, with more patients being discharged in the post-cohort. LOS was slightly lower after implementing the C-SSRS.	Efficient suicide screening can help identify at-risk individuals without overburdening psychiatric resources or causing unnecessary increase in hospitalization time.
2. Fertel et al. (2023)	Determine if universal suicide screening is feasible and its impact on emergency room length of stay.	Qualitative analysis. Patients aged 18 screened using C-SSRS and categorized as no risk, low risk, moderate risk, and high risk.	The "high-risk" group had a higher proportion of male patients and government payers and a longer length of stay in the Emergency Department (ED) than the no-risk group. Those with suicidal ideation accounted for 0.73%-1.58% of ED encounters in a given month.	The implementation of universal suicide screening in all EDs within a healthcare system is feasible, and having trained staff to maintain the safety of these patients properly is crucial.
3. Hermosillo-Da Torre, Mendez-Sanchez, Gonzalez-Betanzos (2023)	Measure the internal organization of the Spanish version of the BHS.	1,260 academics and 150 individuals with a history of suicide attempts. Confirmatory factor analysis in three stages to examine the scale's internal organization.	The scale is unidimensional in clinical samples ($\chi^2＝154.84$, df＝135, $p<0.001$, CFI＝0.99, TLI＝0.99, RMSEA＝0.03) and non-clinical samples; however, a procedural factor was added to the latter regarding acquiescence ($\chi^2＝252.14$, df＝134, $p<0.001$, CFI＝0.95, TLI＝0.94, RMSEA＝0.03).	This study provides evidence of the unidimensionality of the BHS. Its use in clinical contexts reduces the likelihood of biased responses to indicate any trait types.

Identification	Objective	Method/Sample/ Instruments	Main Findings	Conclusion
4. Brent et al. (2023)	Compare the performance of instruments (ASQ and CASSY) that predict suicidal behavior in adolescents seen in emergency departments.	Predictive model analysis. Ask Suicide Screening Questions (ASQ) and Computerized Adaptive Screen for Suicidal Youth (CASSY) scales were used.	Of the 4,050 adolescents enrolled, 2,750 completed screenings and follow-ups. The tools demonstrated similar sensitivity (0.951 [95% CI 0.918-0.984] vs 0.945 [95% CI 0.910-0.980]), specificity (0.588 [95% CI 0.569-0.607] vs 0.643 [95% CI 0.625-0.662]), positive predictive value (0.127 [95% CI 0.109-0.146] vs 0.144 [95% CI 0.123-0.165]), and negative predictive value (both 0.995 [95% CI 0.991-0.998] respectively. Data were identical among patients with physical symptoms (ASQ 0.88 [95% CI 0.81-0.95] vs CASSY 0.94 [95% CI 0.91-0.96]).	Both scales perform well in this type of assessment and are recommended for universal screenings. However, CASSY showed better performance when patients presented psychiatric characteristics.
5. Nandy, Rush, Carmody Maye, Trivedi (2023)	Evaluate the psychometric properties of a brief 9-item self-report health risk screening (CHRT-SR9) for assessing suicide risk in adult primary care patients.	369 adults completed the original 14-item CHRT-SR at baseline and over four subsequent months, from which the CHRT-SR9 was extracted using multigroup confirmatory factor analysis. Measurement invariance (between age and sex) and classical test theory characteristics of CHRT-SR9 were assessed. Concurrent validity was evaluated by comparing CHRT-SR9 responses with the suicide item on the Patient Health Questionnaire (PHQ-9) both cross-sectionally and as a measure of change over time.	Confirmatory factor analysis identified CHRT-SR9 as the optimal solution. Factors included pessimism, helplessness, hopelessness (2 items each), and suicidal thoughts (3 items). Measurement invariance was maintained between sex and age groups, indicating that mean differences between subgroups were real and not attributable to measurement bias. Classical test theory revealed generally acceptable item-total correlations (0.57-0.79) and internal consistency (Spearman-Brown from 0.76 to 0.90). Concurrent validity analyses revealed that CHRT-SR9 can measure both improvement and worsening of suicidal tendencies over time. A PHQ-9 response of 0, 1, 2, and 3 on the suicide item corresponded to CHRT-SR9 total scores of 7.82 (5.53), 16.80 (4.99), 20.71 (5.36), and 25.95 (7.30) (mean and SD) respectively.	CHRT-SR9 is a brief self-report that assesses suicidal tendencies with excellent psychometric properties and sensitivity to changes over time.

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6. Rabinowitz et al. (2022)	Develop indicators that can provide consistency checks for the Hamilton Depression Rating Scale (HAM-D).	The International Society for CNS Clinical Trials and Methodology assembled flags indicating consistency/inconsistency ratings for the HAM-D17. The proposed flags were applied to evaluations derived from the NEWMEDS data repository - 95,468 HAM-D administrations in 32 antidepressant registration clinical trials.	Almost 30% of HAM-D administrations had at least one logical inconsistency flag. 7% had flags suggesting a full review of the rating was needed. Almost 22% had at least one statistical outlier flag, and 79% had more than one.	Applying flags to clinical ratings can help detect inaccurate measures. Reviewing and addressing these flags can improve the reliability and validity of clinical trial data.
7. Simpson et al. (2021)	Describe characteristics and outcomes among patients diagnosed with malingering in a psychiatric emergency service.	Psychiatric consultation indices were identified in the emergency room for all adult patients seen over 27 months.	Nurses used the C-SSRS instrument during routine procedures for all emergency patients.	236 (5%) were diagnosed with malingering. No patient with malingering died by suicide within 365 days after discharge. 16 (4%) non-malingering patients died. 129 (5%) were diagnosed with malingering illness. Malingering was significantly associated with a repeated emergency room visit for self-harm within 365 days in multivariate analyses.
8. Sullivant et al. (2021)	Verify the effectiveness of the Ask Suicide-Screening Questions (ASQ) in identifying high-risk adolescents and connecting them to services.	Quantitative experimental. Setting: pediatric hospital, two emergency departments, three clinics, and outpatient clinics. Patients aged 12 and older. ASQ and C-SSRS were used for suicide screening.	In the first year of screening, 138,598 screenings were completed, and 68% of the screenings were positive for elevated risk.	Early stakeholder and hospital leader engagement and a robust response plan were essential for the successful implementation of this suicide screening program.

Identification	Objective	Method/Sample/ Instruments	Main Findings	Conclusion
9. Aguinaldo et al. (2021)	Validate the ASQ with youth in specialty outpatient and primary care clinics.	Cross-sectional ASQ validation study. N=515 patients aged 10 to 21 from specialty outpatient and primary care clinics. The sensitivity, specificity, and PPV/NPV of the ASQ were assessed.	In the primary care clinic, ASQ showed 100% sensitivity, 87.9% specificity, and 100% NPV. 45% of participants in specialty outpatient clinics and 28% in primary care clinics screened positive for suicide risk on the ASQ.	The ASQ is a valid screening tool for identifying youth at high risk of suicide in clinical outpatient settings.
10. Steeg et al. (2018)	Estimate the predictive accuracy of risk scales using established cohort points.	A comparison of the predictive accuracy of the Manchester Self-Harm Rule (MSHR), React Self-Harm Rule (ReACT), Sad Persons Scale (SPS), and modified SAD PERSONS scale (MSPS) among 4,000 self-harm episodes presented to Emergency Departments (ED) between 2010 and 2012 in England.	SPS and MSPS showed a specificity of 76%-77% and 90% and sensitivity of 24%-29% and 9%-12%, respectively, while MSHR and ReACT showed a sensitivity of 98% and 94% and specificity of 15%-23%. The recurrence rate based on the episode was 28%, and the occurrence of suicide was 0.5%. The scales were more accurate in predicting self-harm recurrence than suicide.	The scales failed to predict self-harm repetition and suicide accurately. The results support existing clinical guidelines not to use risk rating scales exclusively to determine treatment or predict future risks.

Source: Prepared by the authors (2024).

Legend: CSAS-C evaluates anxiety in children; CES-DC measures childhood depression; ABHcomp is a computerized instrument for assessing hospital play; ECI is the Rutter A2 Child Behavior Scale; PANAS-C assesses positive and negative affect in children; APS-Br is a brief version of the Affect in Play Scale; CCSC-R1 verifies children's coping strategies; CNS deals with clinical trials and methodology; BHS assesses hopelessness; ED refers to the Emergency Department; PPV and NPV are Positive Predictive Value and Negative Predictive Value, respectively; LOS represents length of stay; HAM-D17 is the 17-item Hamilton Depression Rating Scale; NEWMEDS researches new medications for Depression and Schizophrenia.

The studies analyzed, detailed in Figure 1 and Table 1, totaled 3,339 Portuguese, English, and Spanish searches. Of these, 662 (19.81%) were from the Web of Science, 1,103 (33.00%) from PUBMED, 99 (2.93%) from SciELO, and 1,475 (44.17%) from MEDLINE. After the initial screening by titles, 215 (6.43%) studies were selected for abstract analysis, of which 27 (0.80%) were excluded due to duplication. This resulted in 188 (5.63%) studies for detailed analysis. In the end, 10 (0.26%) studies in English were included due to the scarcity of articles in Portuguese on suicide risk assessment in primary care, highlighting the predominance of studies on

other screening scales. The concentration of studies in 2023 underscores the growing interest and the need to address the issue, contrasting with the absence of articles in 2019 and 2020 and the lack of studies in Brazil. The conclusions of these studies provide relevant insights into the effectiveness and practical applications of suicide risk screening tools, contributing to a deeper understanding of the current landscape.

Syndergaard et al.[26] analyzed the implementation of universal suicide screening using the C-SSRS in an emergency department, identifying an 18% increase in psychiatric evaluations and a slight reduction in patient length of stay, which showed efficiency in risk identification without overburdening resources.

Aguinaldo et al.[27] validated the ASQ for high-risk adolescents, with 6.8% of screenings positive. They highlighted the importance of early stakeholder engagement and a robust response plan. In specialized clinics, Fertel et al.[28] found the feasibility of universal suicide screening, although "high-risk" patients had longer lengths of stay.

Rabinowitz et al.[29] developed indicators to improve the consistency of the HAM-D

application, which is essential for the validity of clinical trials. Steeg et al.[30] compared risk scales, recommending the complementary use of MSHR, ReACT, SPS, and MSPS for more accurate assessment.

Hermosillo-Da Torre et al.[31] confirmed the unidimensionality of the BHS in clinical samples, while Brent et al.[32] highlighted the performance of ASQ and CASSY in predicting suicidal behavior in adolescents. Nandy et al.[33] validated the CHRT-SR9 in primary care adults, emphasizing its sensitivity to changes over time.

Simpson et al.[34] alerted to the limited sensitivity of the Columbia-Suicide Severity Rating Scale Screener in emergency departments, especially in cases of self-harm, emphasizing the need for complementary approaches in risk assessment.

DISCUSSION

The reviewed studies offer a comprehensive view of suicide screening tools, highlighting both their effectiveness and limitations. The urgent need for effective tools in primary care is evident, especially given the high global number of annual suicides and their prevalence among young people.

Given the existing gap in this scenario, the need for effective, easy-to-apply, and validated tools in primary care drives the present study. The absence of specific studies on tools applicable in primary care is alarming, especially considering that primary health care is the main entry point for about 150 million Brazilians who rely exclusively on the Unified Health System (SUS), according to 2019 IBGE data[35].

Studies like those of Brent et al.[32] show that instruments like ASQ and CASSY perform robustly in universal screenings, although their validity is more established in children and adolescents. As noted by Aguinaldo et al.[27], positive results of ASQ in primary care underline its sensitivity and specificity. Implementations like the C-SSRS, as observed by Syndergaard et al.[26] and Fertel et al.[28], also demonstrate significant benefits in risk identification without overburdening psychiatric resources.

The validation of ASQ for suicide screening reinforces the importance of these tools in early detection, despite inconsistencies found in the HAM-D 17 (with 17 items), as revealed by Rabinowitz et al.[29]. Freire et al.[36] questioned the validity of the prolonged use of HAM-D in Brazil, highlighting the lack of cross-cultural adaptation studies. The CHRT-SR9 scale proved to be a brief and effective instrument with excellent psychometric properties, being highly sensitive to changes over time[28,29,35].

While some scales, such as MSHR, ReACT, SPS, and MSPS showed limitations in predicting suicide, CHRT-SR9 stood out as an effective instrument sensitive to changes over time. These instruments' careful selection and proper adaptation are crucial to ensure their effectiveness in screening and timely intervention, offering valuable insights for mental health professionals, policymakers, and health service managers.

CONCLUSION

Suicide is an issue present in various contexts worldwide and has a significant impact on society. Therefore, this study aimed to develop a scoping review to detect which instruments have the highest validity, sensitivity, reliability, and adaptability for use in assessing the risk of suicidal behavior, focusing on primary care. The results confirm that there are few studies with a focus on primary care, and even though studies suggesting tools for suicide risk screening were found, there are still many discrepancies among them. Among the scales found, the Columbia Suicide Severity Rating Scale (C-SSRS) shows the greatest level of divergence, as some studies affirm that this scale is viable for screening suicidal behavior. In contrast, others demonstrate that it is unreliable and incapable of detecting all aspects of suicidal behavior and ideation. Despite this, it is the only scale that has been applied directly to the general public and not just to children and adolescents. Conversely, the Ask Suicide Screening Questions (ASQ) scale and the Computerized Adaptive Screen for Suicidal Youth (CASSY) instrument demonstrated effectiveness for the screening above. Despite the discrepancies present in studies on the C-SSRS, its importance in identifying these symptoms cannot be underestimated. Therefore, conducting more

qualitative and quantitative studies to address these discrepancies is crucial.

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