ARTICLE ORIGINAL

DOI: 10.15343/0104-7809.202549e17742025I
ISSN: 1980-3990

Suicidal ideation, suicide attempt, and suicide among workers in Brazil: a scoping review

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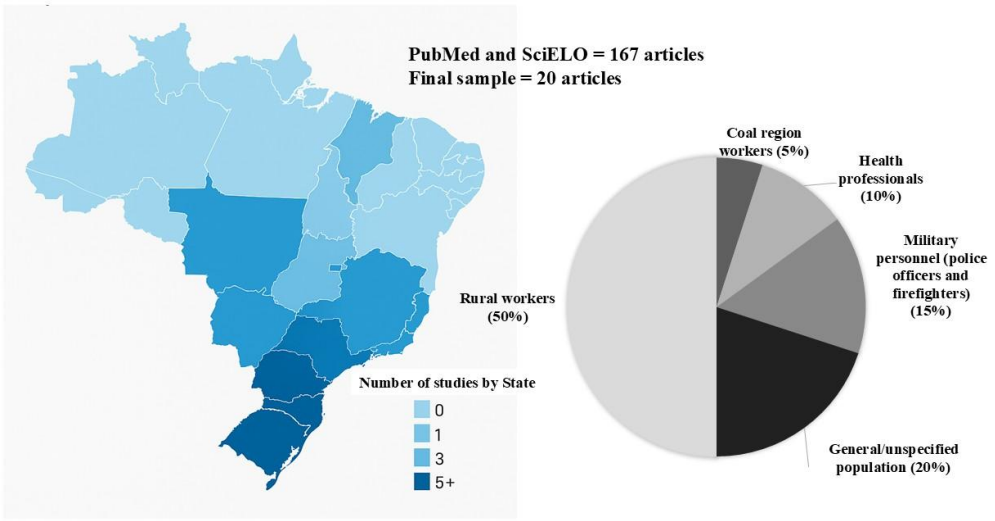
Highlights

- *The review identified 20 studies on suicide among workers in Brazil.*
- *Most studies employed a cross-sectional design and focused on rural workers.*
- *Scientific evidence on the topic remains limited and fragmented.*
- *Psychosocial aspects of work are still insufficiently explored in studies.*
- *There is an urgent need to expand scientific production to inform prevention policies.*

Graphical Abstract



Abstract

Suicide is a complex phenomenon that affects multiple dimensions of life, including the workplace. Changes in working conditions can increase psychological distress and contribute to suicide cases. In Brazil, growing concern about this issue underscores the need for epidemiological studies. This study conducted a review of the scientific literature through searches in the PubMed and SciELO databases for quantitative studies addressing suicide among Brazilian workers. A total of 167 articles were identified, of which 20 met the inclusion criteria. Cross-sectional studies predominated, with a greater concentration in the southern region of the country, most of them focusing on rural workers. The available evidence remains limited, and critical aspects such as exposure to psychosocial factors at work are still poorly explored. It is concluded that there is a pressing need to expand scientific production on this topic, encompassing different occupational groups and employing more robust methodological approaches to support prevention policies.

Keywords: Suicide. Occupational Health. Literature Review.

Associate Editor: Edison Barbieri
Reviewer: Kassandra Maria de Araújo Morais
Mundo Saúde. 2025,49:e17742025
O Mundo da Saúde, São Paulo, SP, Brasil.
https://revistamundodasaude.emnuvens.com.br

Received: 02 july 2025.
Accepted: 04 november 2025.
Published: 27 november 2025.

INTRODUCTION

According to the World Health Organization (WHO)[1], suicide is the deliberate and intentional act of causing one's own death, potentially affecting individuals from diverse backgrounds, social classes, ages, sexual orientations, and gender identities[2]. Data from the *Fórum Brasileiro de Segurança Pública*[3] indicate that between 2022 and 2023 there was an average of 16,128 suicides in Brazil, corresponding to a mean rate of 7.9 cases per 100,000 inhabitants, with a 1.3% decrease between the two years. Although Brazil is not among the countries with the highest suicide rates — ranking 124th worldwide — it had the second-highest absolute number of suicides (14,540 cases) in the Americas, behind only the United States (53,099 cases)[1].

Suicide is a complex and multifactorial phenomenon resulting from the interaction of biological, psychological, environmental, and social factors[4]. Several predisposing or triggering factors may contribute to the decision to commit suicide[5]. Among these, the social determinants of health stand out, encompassing aspects related to work.

Work, beyond ensuring subsistence, carries social and self-esteem dimensions in people's lives. When social support, solidarity among colleagues and leadership, and recognition are present, work can promote both physical and mental health. From a psychodynamic perspective, pleasure and suffering coexist in the work experience, an ambivalence essential for understanding the relationship between working conditions and suicidal behavior. The Brazilian Ministry of Health lists several psychosocial factors in the workplace that can generate distress and trigger individual and collective illness processes[6].

When associated with illness, occupational stress and work-related psychosocial factors — such as workload and pace, interpersonal relations, moral harassment, task content, and organizational culture — become particularly relevant aspects, whose influence depends on the type of activity performed[7,8]. Certain professions are known to be more susceptible to suicide, such as rural workers, healthcare professionals, and bank employees[9,10]. A recent study by Palma *et al.* found that the average suicide rate among agricultural workers in Brazil was 2.6 times higher (21.7/100,000)[11]. Recognized risk exposures include easy access to lethal means, such as pesticides in agriculture and access to medications among healthcare professionals[11].

Suicidal ideation, suicide attempts, and completed suicides in the workplace have gained visibility and have been the focus of studies since the 1990s. Suicidal ideation refers to thoughts, planning, and considerations about committing suicide, whereas a suicide attempt corresponds to an act carried out with at least some intent to end one's own life. The act of self-inflicted injury is often termed parasuicide, self-mutilation, or self-harm. The primary feature of self-harm is the repeated infliction of superficial — though painful — injuries to one's own body, aimed at alleviating negative emotions such as tension and anxiety, or coping with interpersonal conflicts[12].

In France[13], questions have been raised concerning the influence of work processes and organizational management models on distress in the workplace — factors that may contribute to suicidal outcomes. Recent transformations in the world of work — including new information and communication technologies, changes in production processes, longer working hours, work intensification, individual performance evaluations, outsourcing, and rising unemployment — may be contributing to the worsening of psychological distress in society, particularly among workers[14]. Psychological violence perpetrated by managers (such as excessive productivity demands, harassment, and other abusive behaviors), combined with competitive work environments, are factors that can generate mental suffering, trigger mental illness, and contribute to suicide among workers[15,16,17,18].

Following the COVID-19 pandemic[19], discussions about suicide in the work context have taken on a new dimension, broadening the debate across various occupational categories[11].

Given the social relevance of this issue and the scarcity of national scientific production on the topic, this study aimed to conduct a bibliographic survey of Brazilian scientific output in epidemiological studies on suicide among workers.

METHODOLOGY

This study is a literature review conducted in the PubMed and SciELO databases, using the following search strategies and descriptors, respectively:

• ("suicide" OR "parasuicide" OR "suicidal ideation") AND (("work") OR "occupational" AND ("exposure" OR "health")) AND "Brazil"; and

• ("suicídio" OR "parassuicídio" OR "ideação suicida") AND (ocupacional OR trabalho).

Parasuicide is described as behaviors and actions involving life-threatening risk and is one of the terms used as a synonym for "suicide attempt" in the *Descritores em Ciência da Saúde* (DeCS).

Only quantitative studies presenting data on workers residing in Brazil and outcomes involving suicide, suicide attempts, and/or suicidal ideation were included. No temporal restrictions were applied, nor were there exclusions based on participants' occupations in the selected studies. Publications in English, Spanish, and Portuguese were considered.

The search was conducted between February and April 2023, resulting in the identification of 167 articles. Two researchers independently screened the studies, and a third researcher acted as an adjudicator in cases of disagreement. After this stage, 37 articles were selected. Review papers and original studies lacking quantitative analysis were excluded. At the end of the selection process, the final sample comprised 20 publications (Figure 1).

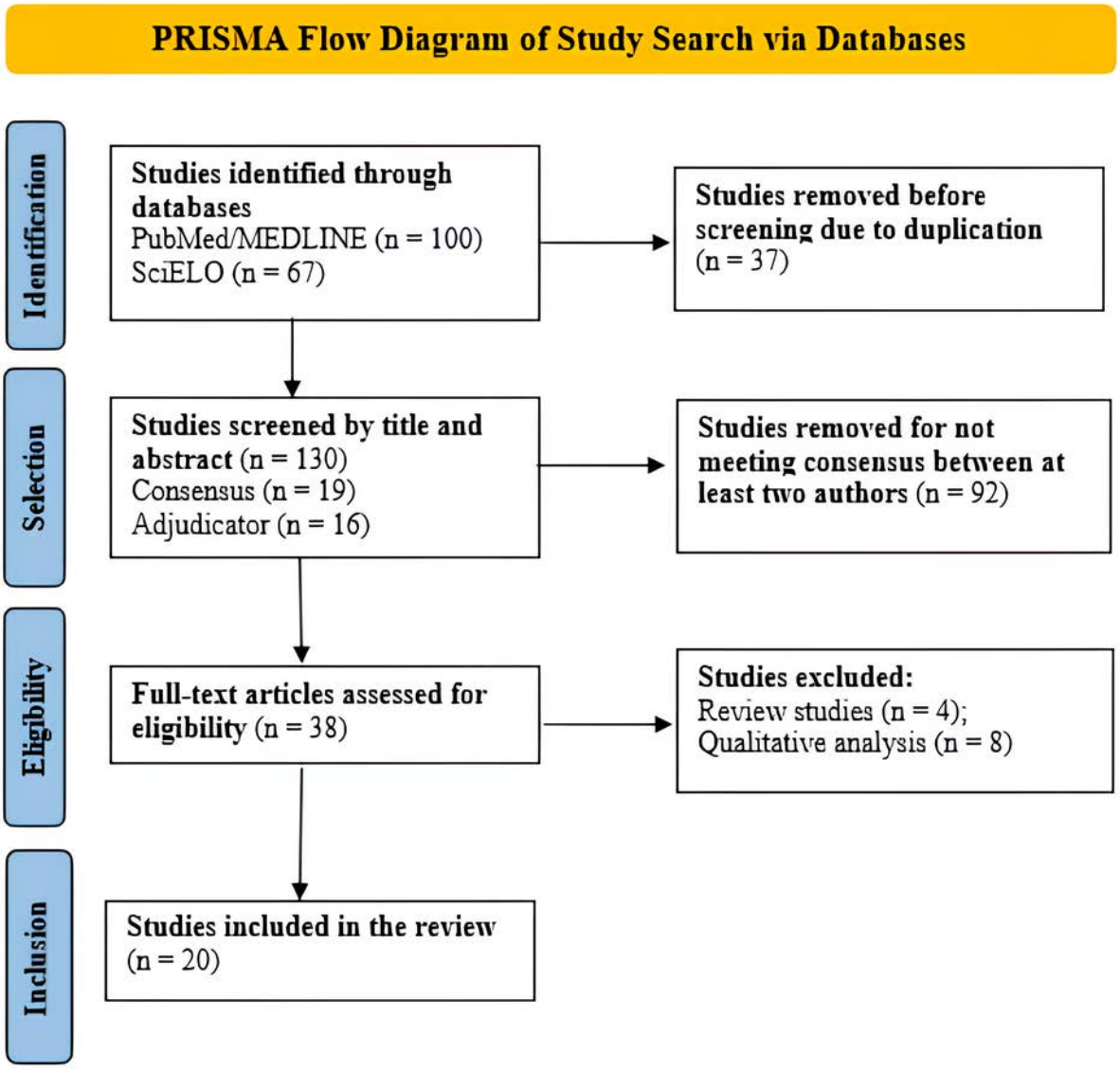


Figure 1 - Identification and selection of articles on suicidal behavior (ideation, attempts, and completed suicides) among workers residing in Brazil. Campinas, 2023.

Although the protocol for this review was not previously registered on public platforms such as PROSPERO or OSF, the study was conducted in accordance with the methodological recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). This choice is justified by the exploratory nature of the scoping approach, aimed at mapping the existing literature and identifying knowledge gaps regarding work-related suicide in the Brazilian context.

RESULTS

Regarding publication data, the year of publication ranged from 2005 to 2022. Concerning study design, most publications were cross-sectional studies (n = 16; 80%), followed by ecological studies (n = 3; 15%) and one case-control study (n = 1; 5%). In terms of study location, the South region accounted for the highest number of publications (Paraná = 1; Rio Grande do Sul = 3; Santa Catarina = 3), followed by the Southeast (Espírito Santo = 1; Minas Gerais = 3; São Paulo = 1), Midwest (Goiás = 1; Mato Grosso do Sul = 2), and Northeast (Pernambuco = 1; Rio Grande do Norte = 1). There were also two nationwide studies and two multicenter studies.

The mean time interval between data collection and publication was 3.15 years. Regarding the studied population, most publications focused on rural workers (n = 10; 50%), followed by the general or unspecified population (n = 4; 20%), military personnel — police officers and firefighters (n = 3; 15%), healthcare professionals — psychiatry residents and health department employees (n = 2; 10%), and coal region workers (n = 1; 5%). The total number of participants ranged from 14 to 3,826 individuals.

Publications addressing suicidal ideation and suicide attempts employed various assessment tools, including researcher-developed questions and items from validated instruments such as the Beck Depression Inventory (BDI), the Self-Report Questionnaire (SRQ-20), and the Patient Health Questionnaire (PHQ-2).

In studies where suicidal ideation was the sole outcome, Oliveira and Santos[20] interviewed 24 military police officers and found that 20.8% (n = 5) reported having thought about suicide. Another study analyzing firefighters[21] identified a 15% prevalence of suicidal ideation associated with occupational stress.

Among healthcare professionals, psychiatry residents[22] and municipal health department employees[23] showed lower prevalence rates of suicidal ideation compared with other groups. Among 115 psychiatry residents, 7% reported suicidal ideation, while in Faria *et al.*'s[22] study with 597 public health workers, 11.6% reported suicidal thoughts, associated with factors such as marital status (divorced or widowed), low education level, smoking history, and interpersonal conflicts at work (with supervisors, colleagues, or service users).

In Oliveira *et al.*[24] study with 450 farmers, suicidal ideation prevalence was 12.44%, associated with demographic factors (sex, age, marital status, race, education, religion, residence, sanitation, self-rated health, family history of mental disorder, common mental disorder, and psychoactive substance use) and work-related factors (employment, income below half the minimum wage, working hours exceeding six per day, temporary or wage-based employment, credit access, debt, production loss, and pesticide exposure).

Gonzaga *et al.*[25], in a study with 547 farmers, observed a higher prevalence of suicidal ideation in the group with greater pesticide exposure (13.2%) compared to those practicing traditional or agroecological farming (5.6%). Rural workers with cumulative exposure to pesticides were more likely to report suicidal ideation within the 30 days preceding the study.

In a study with 2,469 tobacco producers, Szortyka *et al.*[26] reported that 2.5% had suicidal ideation, and 1.2% had attempted suicide at least once in their lifetime. Ideation was associated with demographic factors (sex, age, marital status, education, religion, family history of suicide, smoking, alcohol use, chronic back pain, and tobacco-related diseases) and work characteristics (tobacco production, scaffolding work, harvesting, pesticide-handling tasks, and history of pesticide poisoning). Suicide attempts were associated with non-ergonomic

working postures and exposure to multiple agrochemicals.

Several studies investigating suicide and suicide attempts used secondary data extracted from health surveillance records or national information systems such as SINAN (*Sistema de Informação de Agravos de Notificação*), SIM (*Sistema de Informações sobre Mortalidade*), and SINITOX (*Sistema Nacional de Informações Tóxico-Farmacológicas*). Most of these studies were descriptive and did not include correlation analyses with other variables, unlike the studies focusing on suicidal ideation.

Faria *et al.*[27] analyzed SIM data from 1996 to 2010, identifying 117,469 suicides, approximately 45,000 of which occurred between 2006 and 2010. Suicides occurred predominantly among men, most frequently between the ages of 35 and 64. The most common methods were hanging, firearms, and poisoning, the latter associated with pesticide exposure.

Nascimento *et al.*[28], using DATASUS data from 2007 to 2017, reported that 39% of poisoning incidents among rural workers were motivated by suicide attempts.

Santos *et al.*[29], using data from the TOXCEN system (Espírito Santo) from 2012 to 2016, found that 14.6% of poisoning cases occurred in an occupational context, with 48% related to self-poisoning, predominantly among men.

Albuquerque *et al.*[30] used data from SIM, SINAN, and the Toxicological Assistance Center (CEATOX) to analyze agricultural workers in Pernambuco (2008–2012). In the SIM, 78.6% of the 552 poisonings resulted in suicide. In SINAN, among 2,970 cases, 66% involved suicide attempts, and 87% of deaths were due to suicide. In CEATOX, of 2,449 poisonings, 75.1% were suicide attempts, and 96.5% of deaths were caused by suicide.

Okuyama *et al.*[31], in a study using CIATox data from 2017, analyzed 3,826 cases and found that 51% of poisonings corresponded to suicide attempts, occurring predominantly among adult men outside the agricultural sector. However, mortality was 2.2 times higher among rural workers.

Meyer *et al.*[32], in Minas Gerais, observed a reduction in suicide rates among rural workers between 2000 and 2004. Similarly, Neves *et al.*[33] identified a decline in the proportion of suicides among workers in Goiás, from 44% to 36.4%, between 2005 and 2015.

Pires *et al.*[34] and Recena *et al.*[35] examined pesticide poisonings in Mato Grosso do Sul (1992–2002), revealing high rates of suicide attempts and completed suicides (43% and 37.3%, respectively). Insecticides accounted for the highest proportion of poisonings and suicides (91.5% of deaths).

Ceccon *et al.*[15] analyzed suicide mortality among workers in six Brazilian capitals (2002–2010). The highest frequency was observed in Porto Alegre, followed by São Paulo and Belo Horizonte. The male-to-female ratio—indicating the number of suicides among men relative to women—was 6.8 in Salvador, showing a significant male overmortality. In Belo Horizonte, suicide was associated with occupation type, income, and unemployment, while in Rio de Janeiro, it was associated only with income.

Bernardes *et al.*[36] described intentional medication poisonings in a municipality in Paraná. Most cases occurred among young women (79.1%), and suicide attempts were more frequent among employed individuals than among the unemployed.

Pereira *et al.*[37] reported 14 suicides in a police-military organization in southern Brazil, mainly among white male officers nearing retirement, serving in enlisted ranks, and with a history of financial difficulties. Suicides occurred mostly at home, by firearm or hanging, and were associated with events such as marital separation, disciplinary proceedings, and a history of mental disorders.

Portella *et al.*[38], in a study of 474 suicide cases among charcoal workers in Santa Catarina (1980–2007), found a higher incidence among young male manual laborers aged 15 to 24 years.

Table 1 - Description of the 20 studies selected in the review, according to authorship, sample, study type, outcome, and main findings. Campinas, 2023.

Description of the 20 studies selected in the bibliometric review, according to authorship, sample, study type, outcome, and main findings				
Authorship / Year / Location	**Sample / Study Object**	**Study Type**	**Outcome**	**Main Findings**
Albuquerque et al. (2015)[30] / Pernambuco	SINAN data (n = 2,970) and CEATOX (n = 2,449)	Cross-sectional	Suicide Attempts + Suicide	Work-related suicide attempts accounted for 1.3% of CEATOX records. Among suicides by acute poisoning, the most frequent occupation was farmer (11.8%, SINAN).
Barros et al. (2012)[21] / Minas Gerais	Firefighters (n = 303)	Cross-sectional	Suicidal ideation	A 15% prevalence of suicidal ideation was identified among firefighters.
Bernardes et al. (2010)[36] / Paraná	Poison Control Center data (n = 209)	Case series	Suicide Attempts	37.9% of cases involved employed workers (46.5% of men and 35.6% of women).
Ceccon et al. (2014)[15] / Multicenter	Data from DATASUS and IBGE (2002–2010)	Ecological	Suicide	No significant statistical correlation between suicide and employment, income, or private sector work in Recife, Belo Horizonte, Porto Alegre, Salvador, and Rio de Janeiro. In São Paulo, there was a positive correlation between the employed population and suicide.
Faria et al. (2014)[27] / National	Mortality Information System (SIM) – rural workers (1996–2010)	Ecological	Suicide	A total of 117,469 suicides were recorded. Suicide rates were higher in microregions with greater proportions of women working on farms and larger property areas (≥10 ha). Suicide in both sexes was positively associated with agricultural production and mechanization levels.
Faria et al. (2018)[23] / Rio Grande do Sul	Municipal health department employees (n = 597)	Cross-sectional	Suicidal ideation	Suicidal ideation prevalence was 11.6%. Associated factors included conflict with supervisors (OR 2.4), coworkers (OR 2.56), and service users (OR 2.15). No association with job role.
Gonzaga et al. (2021)[25] / Minas Gerais	Farmers (n = 547)	Cross-sectional	Suicidal ideation	Prevalence of suicidal ideation was 13.2% among pesticide-exposed workers versus 5.6% among agroecological farmers (OR = 2.30).
Meyer et al. (2007)[32] / Minas Gerais	Rural workers (n = 50)	Cross-sectional	Suicide	Of 19 recorded suicides, 18 involved rural workers; 57.9% by pesticide poisoning.
Monteiro et al. (2021)[22] / Rio Grande do Sul	Psychiatry residents (n = 115)	Cross-sectional	Suicidal ideation	Suicidal ideation identified in 7% of residents via PHQ-2.
Nascimento et al. (2020)[28] / National	DATASUS data (rural workers, 2007–2017)	Cross-sectional	Suicide Attempt	39% of poisonings corresponded to suicide attempts; suicide attempts and accidents comprised 80% of total poisonings.
Neves et al. (2020)[33] / Goiás	Rural workers (n = 2,987)	Cross-sectional	Suicide Attempt	Suicide attempts represented 36.4% of reported poisonings.
Oliveira & Santos (2010)[20] / São Paulo	Military police officers (n = 24)	Cross-sectional	Suicidal ideation	20.8% reported suicidal thoughts; higher among tactical force officers (27.3%) than street patrol officers (15.4%).
Okuyama et al. (2020)[31] / Santa Catarina	CIATox pesticide poisoning cases (n = 3,826)	Case-control	Suicide Attempt + Suicide	9% were agricultural workers; 51% of poisonings were suicide attempts. Agricultural work increased the risk of death (OR 2.2; 95% CI 1.15–4.24).
Pires et al. (2005)[34] / Mato Grosso do Sul	Rural workers (n = 9,475)	Cross-sectional	Suicide Attempt	475 pesticide poisonings recorded, including 203 suicide attempts with 63 deaths.
Pereira et al. (2020)[37] / Santa Catarina	Military police officers (n = 14)	Cross-sectional	Suicide	42.9% were in their final career decade; 85.7% were enlisted officers.
Portella et al. (2013)[38] / Santa Catarina	Coal region workers (n = 474)	Ecological	Suicide	Manual laborers performing heavy work showed the highest suicide rate (11.6%).
Recena et al. (2006)[35] / Mato Grosso do Sul	Rural workers (n = 1,335)	Cross-sectional	Suicide Attempt	37.3% of poisonings resulted from suicide attempts.
Santos et al. (2021)[29] / Espírito Santo	TOXCEN data (n = 3,211)	Cross-sectional	Suicide Attempt	Suicide attempts were the main type of poisoning (48%). Occupational exposure accounted for 29.4% versus 67.5% in residential settings.
Santos et al. (2022)[24] / Rio Grande do Norte	Farmers (n = 450)	Cross-sectional	Suicidal ideation	Suicidal ideation prevalence was 12.44%, associated with wage-based or temporary employment (PR = 1.91; 95% CI 1.02–3.57).
Szortyka et al. (2021)[26] / Rio Grande do Sul	Tobacco producers (n = 2,469)	Cross-sectional	Suicidal ideation + Suicide Attempt	Suicidal ideation in 2.5% and suicide attempts in 1.2%. Ideation associated with non-ergonomic posture and chronic pesticide exposure; attempts with intense work and pesticide exposure.

DISCUSSION

This bibliographic survey shows that publications in scientific journals addressing suicidal ideation, suicide attempts, and suicide among Brazilian workers began in the 21st century, although some studies contain retrospective data dating back to the 1980s. This temporal gap reveals that the subject remains emerging in the field of occupational health and lacks analytical approaches that help understand contemporary transformations in work and their impact on mental health[9,11]. More than half of the studies presented methodological designs that do not allow establishing causal relationships due to limitations in the analysis of results and explanatory variables. The findings indicate that scientific evidence on the impact of work-related experiences as a risk factor for the analyzed outcomes remains limited.

The predominance of studies involving rural workers reflects the scientific community's concern about the effects of occupational exposure to pesticides and the social and territorial vulnerabilities that characterize rural Brazil. Beyond the toxic potential of these substances, contextual factors such as geographic isolation, limited access to mental health services, and precarious living conditions act as determinants that heighten the risk of suicide in this group[11,24,25,26,27,30,31,32,33,34,35]. These findings are consistent with regional inequalities observed by Orellana and Souza[19], who identified a higher concentration of suicides in the South and Midwest — regions marked by strong agro-industrial activity and occupational exposure to chemical agents.

Conversely, the scarcity of studies addressing other occupational groups hinders the understanding of urban and service-based work contexts, where distinct forms of distress prevail, associated with work overload, performance pressure, and the erosion of collective relationships[9]. This gap limits the recognition of new manifestations of suffering in both public and private service sectors, where psychosocial aspects of toxic work environments often take the form of control, individual accountability, and loss of recognition.

The analysis of instruments used to measure suicidal ideation reveals methodological progress, including the adoption of validated scales (BDI, SRQ-20, PHQ-2), which allow for the identification of subclinical symptoms and guide secondary prevention actions. However, in studies based on secondary data — especially those addressing suicide attempts and completed suicides — the exploration of workplace context and psychosocial factors remains limited, restricting interpretation to demographic and occupational variables[29,30,31]. As highlighted by Palma *et al.*[11], understanding suicide as a sentinel event related to working conditions requires integrating epidemiological indicators with qualitative analyses of experiences of suffering, recognition, and exclusion.

A particularly meaningful aspect was observed by Pereira *et al.*[37], who reported suicide attempts and deaths occurring at the workplace among military police officers. This suggests that, beyond being a physical setting, the workplace can also represent a symbolic space where suffering takes shape and is expressed. In such cases, the workplace embodies not only the physical site of death but also the symbolic locus where distress is constructed and communicated. This interpretation broadens the understanding of work-related suicide, shifting the focus from the individual to collective and organizational dimensions. This aspect warrants further exploration within the scope of occupational health surveillance, particularly considering the scenarios outlined in the Lista de Doenças Relacionadas ao Trabalho (List of Work-Related Diseases) of the Brazilian Ministry of Health[6]. Recognizing suicide as a sentinel marker of harmful labor conditions implies integrating primary prevention actions — such as organizational improvements, strengthening of social ties, and limiting access to lethal means — with ongoing monitoring and care strategies in health services.

Although some studies have shown regional reductions in suicide rates, significant gaps remain regarding the investigation of protective factors (such as cooperation, recognition, and meaning in work) that, according to work psychodynamics, may act as buffers against psychological breakdown. This ambivalence — where work can lead both to illness and to personal fulfillment — is central to understanding the relationships between pleasure, suffering, and suicidal behavior[9,11]. Such deepened understanding is essential both for explaining the phenomenon and for developing effective prevention policies.

This study has limitations, notably its focus on the epidemiological dimension of national literature, without incorporating qualitative approaches that could provide greater depth in understanding underlying processes. The definition of search terms and database selection may have introduced selection bias. Moreover, publication bias is likely, with underrepresentation of studies reporting negative or non-significant results.

Additionally, this review did not perform a formal assessment of methodological quality among included studies, which could have strengthened the synthesis. Future reviews should consider adopting a more systematized search strategy and applying critical appraisal tools such as the STROBE checklist for observational studies to enhance methodological rigor and reliability of findings.

CONCLUSION

Recognizing work-related suicide as a sentinel event should be a component of occupational health surveillance, guiding prevention and decent work promotion policies. The findings of this review have important implications for public policy formulation and the strengthening of occupational health surveillance. Integrating psychosocial factors at work — such as work overload, moral harassment, precarious employment relationships, and loss of meaning — must be considered a central element in suicide prevention strategies. The recognition of suicide as a sentinel event can support intersectoral actions linking health, labor, and social security systems, enhancing the responsiveness of surveillance mechanisms and promoting healthier, fairer, and life-protective workplaces.

It is noteworthy that no national quantitative studies were found explicitly addressing work as a protective factor against suicide. This absence reveals an important gap in the Brazilian literature, which tends to privilege pathogenic and distress-centered perspectives. Future studies should incorporate frameworks capable of exploring the salutogenic and collective dimensions of work — such as social support, recognition, and cooperation among colleagues — which may serve as resilience factors and protect against mental illness.

CRediT author statement

Conceptualization: Lucca, SR; Bandini, M; Silva-Junior, JS. Methodology: Lucca, SR; Bandini, M. Validation: Lucca, SR; Andersen, CS. Formal analysis: Carniato, EP; Sampaio, MFB; Andersen, CS; Silva-Junior, JS. Research: Carniato, EP; Sampaio, MFB; Andersen, CS; Silva-Junior, JS. Writing – preparation of the original draft: Carniato, EP; Sampaio, MFB. Writing – revision and editing: Lucca, SR; Bandini, M; Andersen, CS; Silva-Junior, JS.

All authors have read and agreed to the published version of the manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the workreported in this paper.

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How to cite this article: Carniato, E.P., Lucca. S.R., Bandini, M., Sampaio, M.F.B., Andersen, C.S., Silva-Junior, J.S. (2025). Suicidal ideation, suicide attempt, and suicide among workers in Brazil: a scoping review. *O Mundo Da Saúde*, 49. https://doi.org/10.15343/0104-7809.202549e17742025I. Mundo Saúde. 2025,49:e17742025.