

Factors associated with depressive symptoms and suicide risk in the elderly in primary health care

Fatores associados a sintomas depressivos e risco de suicídio em idosos na atenção primária à saúde

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ABSTRACT

Objective: to analyze the factors associated with depressive symptoms and the risk of suicide in elderly people assisted in primary health care. **Methods:** cross-sectional study conducted with 298 elderly individuals attended by urban teams of the Family Health Strategy. Sociodemographic and health questionnaires, the Geriatric Depression Scale, and the Nurses' Global Assessment of Suicide Risk instrument were used, administered thru interviews. The associations were analyzed using Pearson's Chi-square test, Fisher's Exact test, and Poisson Regression. **Results:** the prevalence of depressive symptoms was 30.2%, with the majority of the elderly presenting a low risk of suicide. Depressive symptoms were associated with widowhood, the diagnosis of diabetes mellitus, the presence of comorbidities, and the continuous use of medications. The risk of suicide was associated with being single, living alone, having a caregiver, having glaucoma, presenting depressive symptoms, and using psychotropic drugs. **Conclusion:** An association was observed between socio-clinical vulnerabilities, depressive symptoms, and suicide risk in the elderly population. **Contributions to practice:** the findings emphasize the need to qualify primary care professionals for the early screening of vulnerabilities.

Descriptors: Depression; Suicide; Health of the Elderly; Primary Health Care.

RESUMO

Objetivo: analisar os fatores associados a sintomas depressivos e ao risco de suicídio em pessoas idosas assistidas na atenção primária à saúde. **Métodos:** pesquisa transversal realizada com 298 idosos atendidos por equipes urbanas da Estratégia Saúde da Família. Foram utilizados formulário sociodemográfico e de saúde, a Escala de Depressão Geriátrica e o instrumento *Nurses' Global Assessment of Suicide Risk*, aplicados por meio de entrevistas. As associações foram analisadas pelos testes Qui-quadrado de Pearson, Exato de Fisher e Regressão de Poisson. **Resultados:** a prevalência de sintomas depressivos foi de 30,2%, com a maioria dos idosos apresentando baixo risco de suicídio. Sintomas depressivos associaram-se à viuvez, ao diagnóstico de diabetes mellitus, à presença de comorbidades e ao uso contínuo de fármacos. O risco de suicídio associou-se a ser solteiro, residir sozinho, possuir cuidador, ter glaucoma, apresentar sintomas depressivos e fazer uso de psicotrópicos. **Conclusão:** observou-se associação entre vulnerabilidades socioclinicas, sintomas depressivos e risco de suicídio na população idosa. **Contribuições para a prática:** os achados enfatizam a necessidade de qualificar os profissionais da atenção primária para o rastreamento precoce de vulnerabilidades.

Descritores: Depressão; Suicídio; Saúde do Idoso; Atenção Primária à Saúde.

Introduction

With the aging population, the elderly become more vulnerable to negative life events, socioeconomic precariousness, physical illnesses, and isolation, factors that favor the emergence of mental disorders. Conceptually, depressive symptoms refer to manifestations of psychic suffering, such as persistent sadness, anhedonia, and pessimism, which severely compromise the quality of life of the individual, even when they do not meet all the diagnostic criteria for Major Depressive Disorder. In turn, suicidal behavior is understood as a complex phenomenon that encompasses everything from suicidal ideation to the planning and potential execution of the self-inflicted act⁽¹⁾. In the geriatric population, depressive symptoms constitute a critical predictor, markedly increasing the likelihood of suicide risk, which is further aggravated by the high lethality of attempts in this age group⁽²⁾.

In the context of primary health care, the complexity of geriatric mental health is evidenced by the strong intersection between social determinants, family arrangements, and chronic clinical conditions. The epidemiological mapping of these vulnerabilities consolidates the understanding that physical and social ailments are inseparable from psychological suffering^(1,3).

Historically, conditions such as polypharmacy, multimorbidity, and social isolation have emerged as critical markers of deteriorating quality of life and increased risk of self-harm⁽²⁾. Despite this well-established scenario, diagnosis and management in primary care remain insufficient, and it is estimated that a substantial proportion of cases do not receive timely interventions⁽³⁾. This care gap is perpetuated by structural and cultural barriers, particularly limited time for qualified listening, the need for continuous team training, and persistent stigma toward mental illness⁽³⁻⁴⁾.

Despite the growing recognition of depression and suicidal behavior as urgent concerns in gerontology, gaps remain in the literature regarding how these multiple socioclinical vulnerabilities overlap and coexist in the specific routine of the Family Health

Strategy, particularly in Northeastern Brazil⁽¹⁻⁴⁾. Mapping this epidemiological profile and shifting the focus from specialized psychiatric care to the health system's point of entry are essential to support collaborative mental health care and the implementation of active screening protocols by family health teams⁽⁵⁾.

Given this gap, the following research question emerges: what are the sociodemographic and clinical factors associated with the presence of depressive symptoms and the risk of suicide in elderly individuals attended to in the Family Health Strategy? From this perspective, the objective of this study was defined as to analyze the factors associated with depressive symptoms and the risk of suicide in elderly people assisted in primary health care.

Methods

Study design and context

This cross-sectional study was conducted between November 2023 and November 2024 in 27 primary care units in the urban area of Teresina, Piauí. Units were selected to represent the municipality's four administrative regions, under the Center-North, East, Southeast, and South Regional Health Directorates. Reporting followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations for observational studies.

The study population comprised older adults (≥ 60 years), of both sexes, registered with and followed by Family Health Strategy teams in the urban area of Teresina, Piauí. Eligible participants resided in the catchment areas of teams based at the selected primary health care units and had sufficient cognitive ability to answer the interview, as assessed using the Brazilian-adapted version of the Mini-Mental State Examination (MMSE). Education-adjusted cutoffs were 13 points for individuals with no formal education, 18 points for those with low or intermediate education, and 26 points for those with high education⁽⁶⁾. Participants who did not reach the minimum MMSE

score for their educational level, as well as those who could not be located or did not attend after two attempts to schedule the interview, were excluded⁽⁶⁻⁷⁾. Recruitment was conducted individually before routine appointments, and interviews took place in private rooms at the primary health care units.

A probabilistic sampling by clusters in multiple stages was carried out, with initial stratification based on geographical location and proportional allocation. In the first stage, the division by Regional Health Directorate was used as a geographical stratum, with a proportional distribution of the elderly population. In the second stage, the number of primary health care units to be randomly selected in each Regional Health Directorate was determined, maintaining local proportionality; the selection of these units was carried out randomly with the aid of the R software (Project for Statistical Computing), version 3.0.2. In the third and final stage, a random and proportional selection of the participating elderly individuals was carried out within each of the previously selected units, ensuring that the final sample size reflected the population structure of the territory.

The sample calculation was based on the estimated prevalence of depression in the elderly at 16%⁽²⁾, using the formula for infinite populations: $n = (z^2 \cdot p \cdot (1 - p)) / e^2$. A confidence level of 95% ($z = 1.96$) and a tolerable sampling error of 5% ($e = 0.05$) were considered, resulting in a minimum sample of 207 participants. For the purposes of representativeness and complex sampling design, the final sample size was expanded to 298 participants, distributed proportionally across the Regional Health Directorates of the territory: North ($n=69$), South ($n=79$), East ($n=78$), and Southeast ($n=72$). To achieve this quantity, a proportional distribution of the number of elderly individuals within the basic health units of each region was carried out, which were randomly selected, ensuring the representativeness of the entire studied territory.

Instruments and variables

For data collection, three instruments were

used. The first consisted of a sociodemographic form, developed by the researchers, containing the variables age, sex, race/color, marital status, education, family income, retirement, household composition, and caregiver presence. The second was the shortened version of the Geriatric Depression Scale (GDS-15), validated in Brazil, composed of 15 items and a total score ranging from 0 to 15 points, categorized into absence of depressive symptoms (0 to 5), mild or moderate depression (6 to 10), and severe depression (11 to 15). The third instrument was the Nurses' Global Assessment of Suicide Risk (NGASR), validated in Brazil, for the assessment of suicide risk, composed of 15 items and classified into low risk (0 to 5), intermediate risk (6 to 8), high risk (9 to 11), and very high risk (≥ 12)⁽⁸⁻⁹⁾.

Master's students in Sciences and Health from the Universidade Federal of Piauí, linked to the macroproject "Care Practices in the Context of Elderly Health," conducted the data collection. The team underwent methodological and ethical training for standardization of procedures and bias mitigation, immediately followed by the application of a pre-test.

Data collection was conducted through individual interviews held in private rooms at primary health care units. The data were exported from Google Forms to a Microsoft Excel spreadsheet and analyzed using SPSS software, version 22.0. Descriptive analysis was performed with absolute and relative frequencies for qualitative variables and means and standard deviations for quantitative variables. The associations between sociodemographic variables and GDS-15 scores were tested using Pearson's Chi-square or Fisher's exact test, adopting a significance level of $p < 0.05$ and a 95% confidence interval. Considering the study's focus on screening and mapping in mental health, the analytical strategy was initially based on the bivariate investigation of socioclinical associations, followed by the adjustment of Poisson regression models with robust variance. The construction of the multivariate model followed the criterion of including variables that showed statistical significance in the bivariate analysis ($p < 0.05$), in addition to those with recognized theoretical plausibility.

Ethical considerations

For older adults identified as having depressive symptoms or suicide risk during data collection, an immediate management protocol was adopted, consisting of formal referral to the responsible care team for diagnostic assessment and clinical follow-up, in order to safeguard the integrity and well-being of vulnerable participants.

The study was conducted in accordance with Resolutions No. 466/2012 and No. 510/2016 of the Brazilian National Health Council, and all participants signed an informed consent form before inclusion. The study was approved by the Research Ethics Committee of the Federal University of Piauí under opinion No. 6.822.146/2024 and Certificate of Presentation for Ethical Appraisal No. 77901224.4.0000.5214.

Results

The study included 298 older adults. Most were women (66.1%), aged 60–64 years (37.6%), and self-identified as mixed race/brown (65.8%). Regarding the sociodemographic profile, 51.3% of the participants were in a stable union or married, and 38.9% had a low level of education. Most lived on up to one minimum wage (53.0%), while 68.8% were retired or received benefits. More than half lived with a spouse and/or children (58.7%). A caregiver was reported by 12.1% of participants, most commonly the own children (72.2%).

Comorbidities were reported by 88.3% of participants. Hypertension was the most common condition (66.8%), followed by diabetes (35.6%), dyslipidemia (25.8%), depression (15.4%), and Parkinson's disease (0.3%). More than half had two to four comorbidities (57.4%). Medication use was reported by 84.9%, particularly antihypertensive agents (60.7%), antidiabetic agents (25.2%), and psychotropic medications (18.5%); 65.1% used one to four medications.

According to the Geriatric Depression Scale, 208 older adults had no depressive symptoms (69.8%), whereas 72 (24.2%) had mild depressive symptoms

and 18 (6.0%) had severe depressive symptoms. The prevalence of depressive symptoms in the sample was 30.2%.

On the suicide risk scale, assessed using the NGASR instrument, it was observed that 163 elderly individuals presented low risk (54.7%), 72 presented intermediate risk (24.2%), 34 presented high risk (11.4%), and 29 presented very high risk (9.7%). Table 1 presents the distribution of depressive symptoms according to sociodemographic factors. The results were grouped into absence and presence of depressive symptoms.

Table 1 – Association of sociodemographic factors with depressive symptoms among older adults assisted at primary health care units (n=298). Teresina, PI, Brazil, 2025

Variables	Depressive symptom level		p-value
	Absence n (%)	Presence n (%)	
Age (years)			
60–64	79 (70.5)	33 (29.5)	0.521*
65–69	52 (73.2)	19 (26.8)	
70–74	42 (62.7)	25 (37.3)	
≥75	35 (72.9)	13 (27.1)	
Sex			
Male	76 (76.0)	24 (24.0)	0.121*
Female	131 (66.5)	66 (33.5)	
Race/skin color			
White	21 (63.6)	12 (36.4)	0.631†
Black	41 (68.3)	19 (31.7)	
Mixed race/brown	138 (70.4)	58 (29.6)	
Asian	5 (100.0)	0 (0.0)	
Other	3 (75.0)	1 (25.0)	
Marital status			
Single	32 (74.4)	11 (25.6)	0.039*
Married/stable union	113 (73.9)	40 (26.1)	
Separated/divorced	29 (72.5)	11 (27.5)	
Widowed	34 (54.8)	28 (45.2)	
Education (years)			
No formal education	32 (58.2)	23 (41.8)	0.052*
Low (1 to <4)	79 (68.1)	37 (31.9)	
Intermediate (≥4 to <8)	45 (71.4)	18 (28.6)	
High (≥8)	52 (81.3)	12 (18.8)	
Family income (minimum wages)			
No income	3 (42.9)	4 (57.1)	0.548†
<1	112 (70.9)	46 (29.1)	
≥1 and <2	63 (67.7)	30 (32.3)	
≥2 and <5	26 (74.3)	9 (25.7)	
>5	4 (80.0)	1 (20.0)	
Retirement/benefit			
Yes	136 (66.3)	69 (33.7)	0.073*
No	72 (77.4)	21 (22.6)	
Living arrangement			
Alone	29 (70.7)	12 (29.3)	0.109†
With spouse and/or child(ren)	130 (74.3)	45 (25.7)	
With relatives	47 (59.5)	32 (40.5)	
With a friend	2 (66.7)	1 (33.3)	
Has a caregiver			
Yes	21 (58.3)	15 (41.7)	0.160*
No	187 (71.4)	75 (28.6)	
Relationship to caregiver			
Child	15 (57.7)	11 (42.3)	0.237†
Spouse	2 (100.0)	0 (0.0)	
Family member/relative	4 (80.0)	1 (20.0)	
Others	–	2 (100.0)	

*Pearson's Chi-square test; †Fisher's exact test

It was found that the health conditions of the elderly in this study, such as having diabetes mellitus ($p=0.020$), having a comorbidity ($p=0.021$), and continuous use of medications ($p=0.012$), were significantly associated with the presence of depressive symptoms.

A significant association was observed between the risk of suicide and being single ($p=0.027$), living alone ($p=0.007$), and having a caregiver ($p=0.005$), according to Table 2.

Table 2 – Association between suicide risk and the sociodemographic characteristics of older adults assisted at primary health care units (n=298). Teresina, PI, Brazil, 2025

Variables	NGASR risk level				p-value
	Low	Intermediate	High	Very high	
	n (%)	n (%)	n (%)	n (%)	
Age (years)					
60–64	60 (53.6)	25 (22.3)	12 (10.7)	15 (13.4)	0.372 [†]
65–69	36 (50.7)	18 (25.4)	7 (9.9)	10 (14.1)	
70–75	39 (58.2)	16 (23.9)	10 (14.9)	2 (3.0)	
≥75	28 (58.3)	13 (27.1)	5 (10.4)	2 (4.2)	
Sex					
Male	64 (64.0)	19 (19.0)	9 (9.0)	8 (8.0)	0.142*
Female	98 (49.7)	53 (26.9)	25 (12.7)	21 (10.7)	
Prefer not to answer	1 (100.0)	–	–	–	
Race/skin color					
White	13 (39.4)	12 (36.4)	2 (6.1)	6 (18.2)	0.129 [†]
Black	33 (55.0)	13 (21.7)	4 (6.7)	10 (16.7)	
Mixed race/brown	111 (56.6)	45 (23.0)	27 (13.8)	13 (6.6)	
Asian	4 (80.0)	1 (20.0)	–	–	
Other	2 (50.0)	1 (25.0)	1 (25.0)	–	
Marital status					
Single	27 (62.8)	11 (25.6)	2 (4.7)	3 (7.0)	0.027 [†]
Married/stable union	94 (61.4)	32 (20.9)	16 (10.5)	11 (7.2)	
Separated/divorced	21 (52.5)	8 (20.0)	6 (15.0)	5 (12.5)	
Widowed	21 (33.9)	21 (33.9)	10 (16.1)	10 (16.1)	
Education (years)					
No formal education	25 (45.5)	17 (30.9)	5 (9.1)	8 (14.5)	0.172 [†]
Low (1 to 4)	63 (54.3)	28 (24.1)	13 (11.2)	12 (10.3)	
Intermediate (5 to 8)	34 (54.0)	15 (23.8)	6 (9.5)	8 (12.7)	
High (≥9)	41 (64.1)	12 (18.8)	10 (15.6)	1 (1.6)	
Family income (minimum wages)					
No income	4 (57.1)	1 (14.3)	2 (28.6)	–	0.723 [†]
<1	80 (50.6)	42 (26.6)	18 (11.4)	18 (11.4)	
≥1 and <2	53 (57.0)	21 (22.6)	10 (10.8)	9 (9.7)	
≥2 and <5	22 (62.9)	8 (22.9)	4 (11.4)	1 (2.9)	
>5	4 (80.0)	–	–	1 (20.0)	
Retirement/benefit					
Yes	108 (52.7)	48 (23.4)	25 (12.2)	24 (11.7)	0.304*
No	55 (59.1)	24 (25.8)	9 (9.7)	5 (5.4)	
Living arrangement					
Alone	18 (43.9)	6 (14.6)	11 (26.8)	6 (14.6)	0.007 [†]
With spouse and/or child(ren)	107 (61.1)	42 (24.0)	13 (7.4)	13 (7.4)	
With relatives	36 (45.6)	24 (30.4)	10 (12.7)	9 (11.4)	
With a friend	2 (66.7)	–	–	1 (33.3)	
Has a caregiver					
Yes	11 (30.6)	12 (33.3)	9 (25.0)	4 (11.1)	0.005 [†]
No	152 (58.0)	60 (22.9)	25 (9.5)	25 (9.5)	
Relationship to caregiver					
Child	5 (19.2)	10 (38.5)	7 (26.9)	4 (15.4)	0.693 [†]
Spouse	1 (50.0)	1 (50.0)	–	–	
Family member/relative	3 (60.0)	1 (20.0)	1 (20.0)	–	
Others	1 (50.0)	–	1 (50.0)	–	

*Pearson's Chi-square test; [†]Fisher's exact test; NGASR: Nurses' Global Assessment of Suicide Risk

Analysis of clinical variables in relation to suicide risk showed that most investigated comorbidities were not statistically significant. However, depressive symptoms were associated with suicide risk ($p<0.001$). Only 23.9% of older adults with depressive symptoms were classified as low risk, whereas 76.1% were distributed across intermediate (37.0%), high (17.4%), and very high (21.7%) risk levels. Glaucoma was also associated with risk level ($p=0.011$), with the largest concentration of cases in the intermediate-risk category (51.7%; $n=15$).

The number of comorbidities was significantly associated with suicide risk ($p=0.006$): the proportion of older adults at low risk decreased from 73.2% among those with one comorbidity to 34.7% among those with five or more. Psychotropic medication use was also associated with risk level ($p=0.001$), with only 29.1% ($n=16$) of users classified as low risk, compared with 20.0% ($n=11$) classified as very high risk.

A statistically significant association was observed between GDS-15 and NGASR scores among older adults assisted by the Family Health Strategy, demonstrating a relationship between suicide risk level and depressive symptoms ($p<0.001$), as shown in Table 3.

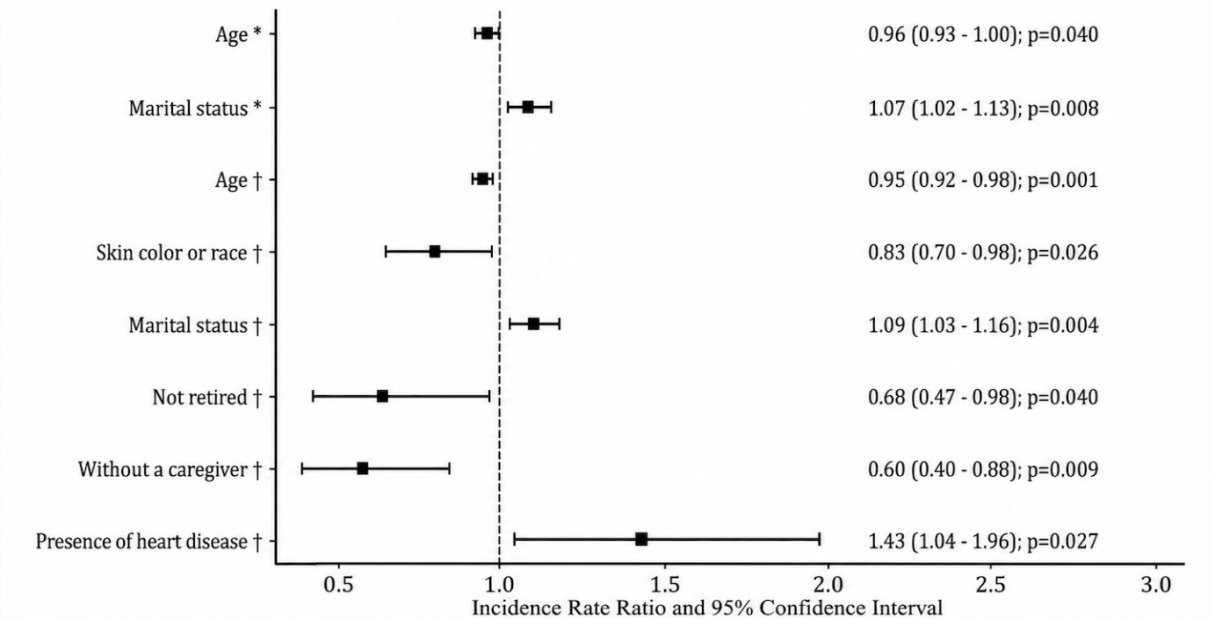
Table 3 – Association between the Geriatric Depression Scale and the *Nurses' Global Assessment of Suicide Risk* instrument ($n=298$). Teresina, PI, Brazil, 2025

NGASR risk level	Geriatric depressive symptom level		p-value
	Absence n (%)	Presence n (%)	
Low	143 (87.7)	20 (12.3)	<0.001*
Intermediate	41 (56.9)	31 (43.1)	
High	16 (47.1)	18 (52.9)	
Very high	8 (27.6)	21 (72.4)	

*Pearson's Chi-square test; NGASR: *Nurses' Global Assessment of Suicide Risk*

The proportion of elderly individuals with depressive symptoms ranged from 12.3% in the low-risk group to 72.4% in the very high-risk group, demonstrating that the higher the risk of suicide, the greater the prevalence of depressive symptoms.

As a follow-up to the initial associations identified in the bivariate analysis, and with the aim of evaluating the factors independently associated with the study outcomes, multivariate Poisson regression models with robust variance ($p < 0.05$) were adjusted. The independent effects were measured by the Incidence Rate Ratio and the respective 95% confidence intervals, as shown in Figure 1.



*Geriatric Depression Scale variables; †Nurses' Global Assessment of Suicide Risk variables

Figure 1 – Sociodemographic and clinical factors associated with GDS-15 scores and NGASR level ($n=298$). Teresina, PI, Brazil, 2025

In the model adjusted for the GDS-15, only two variables maintained statistical significance. Age acted as a protective factor (Incidence Rate Ratio – IRR = 0.96; confidence interval – CI 95%: 0.93-1.00; $p = 0.040$), indicating that older patients showed a greater tendency toward the absence of symptoms. In contrast, the advancement in marital status, toward separation or widowhood, was independently associated with a worsening of the depressive condition (IRR = 1.07; 95% CI: 1.02-1.13; $p = 0.008$).

For the NGASR level, age (IRR = 0.95; $p = 0.001$) and color/race (IRR = 0.83; $p = 0.026$) showed a negative association, shifting the expectation protectively toward low risk. Corroborating the previous model, the marital status also increased the vulnerability score (IRR = 1.09; $p = 0.004$). Indicators of autonomy preservation substantially reduced the expected risk: the fact that the patient is not retired (IRR = 0.68; $p = 0.040$) and does not have a caregiver (IRR = 0.60; $p = 0.009$). Finally, the presence of heart diseases stood out as the main independent clinical aggravator, significantly increasing the patient's propensity to high-risk levels (IRR = 1.43; 95% CI: 1.04-1.96; $p = 0.027$).

Discussion

The results of this study demonstrate that a significant portion of the elderly assisted in primary health care by the Family Health Strategy presents depressive symptoms, which reinforces the centrality of this level of care in the diagnostic and therapeutic approach to depressive symptoms⁽¹⁰⁾. About 80% of people who commit suicide seek care from primary care professionals in the periods close to the fatal event, which consolidates the role of this service in the early recognition of high-risk cases⁽¹¹⁾.

Aligned with this healthcare reality, the socio-demographic profile mapped in this research revealed a predominantly female sample, reaffirming the phenomenon of the feminization of old age already established in the literature. This phenomenon is frequently attributed to the greater longevity of women

and their more active pursuit of health services. The prevalent age group characterizes a population in the early stages of aging, in which mental health promotion strategies can have significant impacts⁽¹¹⁾.

Economic conditions and support networks are factors associated with the modulation of these conditions⁽¹²⁾. Most older adults survived on limited incomes, although they lived with a spouse or children. Financial hardship in low-income groups may limit leisure opportunities and access to diverse support networks, thereby increasing emotional vulnerability and hindering favorable treatment outcomes⁽¹²⁻¹³⁾. Education also emerged as a critical vulnerability, as part of the sample had little or no formal education. Lower educational attainment is associated with poorer clinical outcomes and difficulties in self-management of care⁽¹³⁾.

Regarding the prevalence of depressive symptoms, the indicators show that a considerable portion of the studied population experiences some level of psychological distress. The early detection of these states is hindered by the tendency to normalize sadness in the aging process, which can result in late diagnoses and prevent the initiation of timely interventions in primary care⁽¹³⁾. Beyond this diagnostic barrier, it is necessary to identify the social determinants involved in this scenario; indeed, the marital situation has proven to be a factor associated with both depressive symptoms and suicidal ideation⁽¹⁴⁾. The association between the condition of being a widow and the presence of depressive symptoms indicates that the loss of a partner constitutes a highly impactful life stressor event. On the other hand, the condition of being single was associated with the risk of suicide, reinforcing that emotional bonds act as a social protection factor in old age⁽¹⁴⁻¹⁵⁾.

The clinical complexity of the elderly population is illustrated by the prevalence of comorbidities, which negatively impacts physical and mental health⁽¹⁶⁾. Hypertension was the most frequently reported condition, followed by diabetes mellitus. A statistical overlap was found between the diagnosis of diabetes and the presence of depressive symptoms⁽¹⁶⁾.

Regarding the pharmacological profile, the continuous use of medications suggests a direct relationship with depressive symptoms. The use of psychotropic drugs requires medication monitoring and psychosocial follow-up⁽¹⁷⁾. Finally, a growing relationship was observed between the presence of depressive symptoms and the level of suicide risk in old age.

In parallel, the results demonstrate that a considerable proportion of the sample exhibits vulnerability to suicide, ranging from intermediate, high, to very high risks⁽¹⁶⁾. The use of validated scales allows the multidisciplinary team to establish care priorities, ensuring more rigorous monitoring for those in situations of functional and psychiatric impairment⁽¹⁸⁾.

Social isolation manifested by the act of living alone was associated with an increased risk of suicide. The disconnection from family and friends is recognized as a factor that enhances the feeling of loneliness and psychological suffering, turning isolation into a marker of vulnerability for mortality and the development of neuropsychiatric conditions⁽¹⁹⁾. Another relevant aspect refers to the association between the presence of a caregiver and the increased risk of suicide⁽²⁰⁾.

This relational vulnerability becomes even more complex when associated with declines in physical health; in this sense, glaucoma has also been shown to be significantly associated with the risk of suicide. Conditions that affect vision compromise functionality and increase insecurity in basic daily activities, such as mobility⁽²⁰⁾. The threat of sensory loss acts as a persistent stressor that exacerbates psychological suffering, promoting the development of mental disorders due to reduced interaction with the external environment and increased risk of falls⁽²¹⁾.

When analyzing the multivariate models, it is observed that the determinants of psychological suffering and suicide risk in the elderly population traverse an intrinsic network of biological, social, and clinical factors. A finding of this study was the protective role played by advancing age for both depressive symptoms and the risk of suicide.

Although biological aging is often associated

with general decline, the literature indicates that older seniors tend to develop greater emotional resilience, more effective coping strategies, and lower reactivity to daily stressors compared to younger seniors, justifying the lower propensity for severe depressive episodes and risk ideations in this age group⁽²²⁾.

On the other hand, variables related to social structure and loss of autonomy emerged as strong independent predictors of vulnerability. One of them is marital status, whose progression toward separation and widowhood has solidified as a factor exacerbating both depression and the risk of suicide. The dissolution of the marital bond deprives the elderly of their main source of social support and daily emotional validation, triggering feelings of helplessness that exacerbate psychological suffering⁽²³⁾.

This need to preserve social roles and independence is reinforced by the identified protective associations: non-retired elderly individuals and those without caregivers showed a lower risk of suicide. Remaining integrated into the labor market or engaged in productive activities provides the elderly with a sense of utility, purpose, and social engagement, while the absence of a caregiver reflects the maintenance of functional capacity and self-determination. Conversely, the need for a caregiver often signals an abrupt transition to physical or cognitive dependence, which severely compromises the individual's self-image and increases their psychological vulnerability⁽²⁴⁾.

Finally, in the clinical context, the presence of heart diseases stood out as the main independent aggravating factor for the high risk of suicide, increasing the propensity by 43%. Cardiovascular diseases impose severe physical limitations, chronic pain, constant fear of imminent death, and a significant reduction in quality of life. Moreover, systemic inflammatory processes and neuroendocrine alterations typical of chronic heart diseases exacerbate neuropsychiatric dysfunctions, making these patients priority targets for screening and early intervention in primary care⁽²⁵⁾.

Given the listed associations, the role of primary health care in the mental health care of the elderly

population is highlighted. The Family Health Strategy, thru its capillarity and territorial bond, is configured as the environment for the early screening of psychological suffering. For this screening to transcend identification and result in effective care, it is necessary to strengthen the matrix and qualify the teams for the management of mental health cases in the territory.

Study limitations

The present study presents limitations inherent to its methodological design. As it is a cross-sectional study, it is not possible to establish causal inferences or temporal relationships between the variables and the outcomes studied. Although the implemented probabilistic sampling ensures the robustness and representativeness of the territorial data, the use of self-reported questionnaires imposes the risk of information bias, especially when addressing sensitive topics such as mental health and risk behavior in the elderly.

Moreover, it is important to consider the limitation in inferring the temporality of the observed associations; due to the cross-sectional design, it is not possible to determine whether depressive symptoms precede the risk of suicide, if they coexist, or if both are influenced by common vulnerabilities.

Contributions to practice

The findings emphasize the need to rethink primary care for older adults to systematically incorporate the psychosocial dimension. It is essential that health professionals in the Family Health Strategy use educational strategies that are sensitive to the socio-cultural context and the literacy level of each individual to help them cope with stressful situations.

Conclusion

It can be concluded that there is a significant association between the presence of depressive symptoms and conditions such as widowhood, diabetes mellitus, and ongoing medication use in the elderly

population studied. The risk of suicide, in turn, was associated with the absence of a spousal relationship, living alone, having a caregiver, and using psychotropic medications. These findings highlight the profile of co-existing vulnerabilities in this population and underscore the strategic importance of primary health care. It is essential to strengthen the Family Health Strategy through the implementation of active mental health screening protocols, training of teams, and promotion of matrix-based care, with the aim of intervening early in the biopsychosocial vulnerabilities associated with aging.

Author contributions

Conception and design or analysis and interpretation of data; Drafting of the manuscript or significant critical review of the intellectual content; Final approval of the version to be published; Agreement to be accountable for ensuring that all aspects of the manuscript related to the accuracy or integrity of any part are properly investigated and resolved: **Pessoa FGS, Sales JCS, Silva Junior AP, Gonçalves AMS, Silva Júnior FJG, Vieira CPB, Avelino RS.**

Data availability

The authors declare that the complete dataset supporting the results is available within the article and is not subject to access restrictions.

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