Validity and reliability of Kessler Psychological Distress Scale for Brazilian elderly: a cross-sectional study

Validade e confiabilidade da Escala de Estresse Psicológico de Kessler para idosos brasileiros: estudo transversal

Validez y confiabilidad de la Escala de Estrés Psicológico de Kessler para ancianos brasileños: un estudio transversal

Gabriella Oliveira de Albuquerque Lins[I]
ORCID: 0000-0002-3884-5805

Nathália Angel da Silva Lima[I]
ORCID: 0000-0002-2450-1470

Girliani Silva de Sousa[II]
ORCID: 0000-0002-0988-5744

Fernanda Jorge Guimarães[I]
ORCID: 0000-0003-4618-3730

Iracema da Silva Frazão[I]
ORCID: 0000-0002-4690-3753

Jaqueline Galdino Albuquerque Perrelli[I]
ORCID: 0000-0003-4934-1335

[I] *Universidade Federal de Pernambuco. Recife, Pernambuco, Brazil.*
[II] *Universidade Federal de São Paulo. São Paulo, São Paulo, Brazil.*

ABSTRACT
Objective: to verify the validity and reliability of the Psychological Distress Scale for screening mental distress. **Methods:** a cross-sectional study with 75 elderly people. Psychological Distress scale and Self Reporting Questionnaire were used. Criterion validity was verified using Spearman's correlation and diagnostic accuracy measures. Cronbach's alpha coefficient was used to investigate reliability. **Results:** the total internal consistency of the Psychological Distress Scale was α=0.844. Concurrent validity between this instrument and the Self Reporting Questionnaire was ρ=0.722 (p<0.001). The best cut-off point for screening mental distress among elderly people was a total score greater than 14, with sensitivity equal to 75.47% and specificity equal to 85.0%. **Conclusions:** the scale was robust for screening mental distress, given its high reliability, in terms of homogeneity, and adequate criterion validity, whose best cut-off point for screening was a score greater than 14.
Descriptors: Suicide; Stress, Psychological; Mental Disorders; Aged; Nursing.

RESUMO
Objetivos: verificar a validade e a confiabilidade da Escala de Estresse Psicológico para rastreio de sofrimento mental. **Métodos:** estudo transversal com 75 idosos. Utilizou-se escala de Estresse Psicológico e *Self Reporting Questionnaire*. Validade de critério foi verificada por meio da correlação de Spearman e de medidas de acurácia diagnóstica. Utilizou-se Coeficiente alfa de Cronbach para investigação da confiabilidade. **Resultados:** a consistência interna total da escala de Estresse Psicológico foi α=0,844. A validade concorrente entre esse instrumento e o *Self Reporting Questionnaire* foi ρ=0,722 (p<0,001). O melhor ponto de corte para rastreio de sofrimento mental entre idosos foi escore total maior do que 14, com sensibilidade igual a 75,47% e especificidade igual a 85,0%. **Conclusões:** a escala apresentou-se robusta para rastreamento de sofrimento mental, dada a sua elevada confiabilidade, em termos de homogeneidade, e adequada validade de critério, cujo melhor ponto de corte para rastreio foi pontuação maior do que 14.
Descritores: Suicídio; Estresse Psicológico; Transtornos Mentais; Idoso; Enfermagem.

RESUMEN
Objetivos: verificar la validez y confiabilidad de la Escala de Estrés Psicológico para el cribado del sufrimiento mental. **Métodos:** estudio transversal con 75 personas mayores. Se utilizó la escala y el cuestionario de autoinforme. La validez de criterio se verificó mediante la correlación de Spearman y las medidas de precisión diagnóstica. Se utilizó el coeficiente alfa de Cronbach para investigar la confiabilidad. **Resultados:** la consistencia interna total de la escala fue α=0,844. La validez concurrente entre este instrumento y Self Reporting Questionnaire fue ρ=0,722 (p<0,001). El mejor punto de corte para el cribado del sufrimiento mental fue una puntuación total > 14, con una sensibilidad de 75,47% y una especificidad de 85,0%. **Conclusiones:** la escala fue robusta para el seguimiento del sufrimiento mental, dada su alta confiabilidad, en términos de homogeneidad, y adecuada validez de criterio, cuyo mejor punto de corte para el cribado fue una puntuación mayor a 14.
Descriptores: Suicidio; Estrés Psicológico; Transtornos Mentales; Anciano; Enfermería.

INTRODUCTION

The world is getting older. The elderly population in the Americas accounted for 14.6% of the total population in 2017, and, worldwide, 12.0%, with a forecast to double by 2050 and triple by 2100[1-2]. The Brazilian scenario deserves attention, as its elderly population has already exceeded 30 million in 2017, and the fastest growing segment is 80 years old or more[3]. Elderly people, especially those over 80 years old, are affected by a gradual loss of physical, emotional and social autonomy to perform activities of daily living (ADL) that have an imperative impact on their quality of life and well-being[4-6].

A population-based research with elderly people in southern Brazil showed a prevalence of 36.1% for functional disability related to basic activities, 34.0% for instrumental and 18.1% for both. Moreover, higher prevalence of functional disability was observed in elderly people ≥80 years[7]. In this regard, fragility and loss of autonomy can culminate in psychological changes that lead to the onset or worsening of mental disorders, such as mood disorders, especially depression, and increased risk of suicide[4-6]. Researches have shown a high occurrence of insomnia, tiredness, fatigue, stress, somatic complaints, among others, in the elderly population[8-10]. Such symptoms characterize common mental disorders (CMD), commonly found in community spaces, whose presence indicates a change in relation to individuals' typical functioning[11].

Studies show a strong association between mental disorders, mental distress and suicide in the elderly population[6,12]. Furthermore, authors emphasize that dependence on other people, loss of autonomy and social isolation sometimes lead to the option of death as an alternative. Added to this are frequent financial and emotional losses, and negative changes that result in a social and subjective death, which further enhances risk of suicide and suicide[13]. A review on suicide among elderly people in Brazil showed a lack of research in Latin America, specifically in the Brazilian context, related to the identification of suicide risk[14]. Furthermore, it is still incipient in Primary Health Care (PHC) to implement public policies that privilege assistance to elderly people, with appreciation of care for the mental health of this population.

In this opportunity, PHC nurses are important professionals to provide comprehensive care to elderly people and, through their training, identify mental distress and risk of suicide. Thus, it allows early diagnosis, adequate treatment, ensuring dignity of life recovery and (re) construction of new life projects for elderly people. Nursing care for elderly people with this clinical condition favors early screening, and is essential for decision-making and planning and implementing appropriate nursing interventions to promote mental health, manage mental distress and prevent suicide.

In this perspective, using instruments to screen mental distress in elderly people in PHC is a way to provide nurses with a safe clinical practice for planning interventions that consider the multidimensionality of aging. Among the instruments aimed at screening mental distress used by several world organizations, including the World Health Organization (WHO)[15], the Kessler Psychological Distress Scale[16], versions with six (K6) and ten items (K10), stands out. It is an instrument composed of items about anxiety and depression that a person experienced in the most recent period of four weeks[16]. Studies with Canadian[17], Australian[18] and Portuguese elderly people[19] showed validity and adequate reliability of the referred scale.

Researchers point out that the usefulness of an instrument is related to its ability to present scientifically robust results, and this occurs through good psychometric properties. Moreover, they emphasize that such properties must be investigated for a particular population/situation, since it is possible that an instrument is valid and reliable only for a given population[20-21]. Although it is available in Brazilian Portuguese, there is a scarcity of studies on the validity and reliability of K10 in Brazil, and, to date, no publications on validation of this scale have been found for the Brazilian elderly population, which highlights the relevance of this research.

In the elderly care scenario, it appears that care is based on a biomedical model that favors curative actions[22]. In this regard, nursing interventions for this population consist mainly of home visits and monitoring of chronic non-communicable diseases such as diabetes and hypertension. Thus, actions to promote mental health and prevent mental illness are still scarce. Therefore, it is necessary to broaden nursing actions in this field and use valid and reliable instruments that support a systematic, scientific nursing practice and with better results. Thus, it is believed that the scale can support nursing actions in caring for elderly people's mental health, especially in PHC, as it is easy and quick to apply, low cost, in addition to providing information on anxious and depressive symptoms that will guide nursing interventions more effectively.

OBJECTIVE

To verify the validity and reliability of the Psychological Distress Scale (K10) for screening mental distress.

METHODS

Ethical aspects

The project was approved by a Human Research Ethics Committee.

Study design, period, and location

This is a descriptive, cross-sectional study with a quantitative approach carried out in three Basic Health Units (BHU) located in the countryside of Pernambuco State, Brazil, from March 2017 to June 2018. The research was organized according to STROBE checklist: cross-sectional studies.

Population or sample; inclusion and exclusion criteria

The study population was composed of elderly people monitored in the respective units. The sample estimate was calculated according to the following parameters: finite population (N=320); prevalence of the phenomenon (55.8%)[9] and sample error of 10.0% (0.01). Thus, the sample was estimated at 73 elderly. A naturalistic sampling strategy was adopted[23], in which elderly people were selected consecutively, using the following inclusion

criteria: men and women aged 60 years or over, literate and followed by the health teams of the respective BHU, from March 2017 to June 2018. Health unit users who had cognitive impairment, spatial-temporal disorientation, altered level of consciousness or who had any physical discomfort that made it impossible or difficult to complete the instruments were excluded.

Study protocol

Data were collected by trained researchers, through interviews, in a BHU reserved space. A script with sociodemographic characterization, the Self Reporting Questionnaire (SRQ - 20) and K10 were used. The SRQ - 20 is a self-administered instrument, recommended by WHO for studies in PHC for screening for CMD and/or mental illness due to its easy application and low cost[24]. It has validity[25] and reliability[26] suitable for use in the Brazilian population. It is a questionnaire composed of 20 items whose answers are dichotomous (yes/no). Each affirmative answer scores one point to compose the final score through the sum of these values. The scores obtained are related to the probability of the presence of non-psychotic disorder (depressive, anxious, and somatic symptoms), and range from 0 (no probability) to 20 (extreme probability). In order to identify the presence of CMD in elderly people, a score greater than or equal to five points is suggested[17].

Furthermore, the SRQ - 20 has an item related to suicidal ideation, which, in turn, is an important indicator of suicide risk. Researches have highlighted an association between suicidal ideation and a higher risk of suicide attempts and with the consummated act so that the presence of ideation and, mainly, a history of suicide attempts have been considered as important predictors in risk of suicide assessment[6,27]. Thus, in this study, suicidal ideation was assessed based on the question: have you been thinking about ending your life? The participant who marked "yes" for this item was considered to have a suicidal ideation/suicide risk.

Mental distress was assessed using the K10 scale[16]. This instrument consists of ten items about anxious and depressive symptoms that a person has experienced in the most recent period of four weeks. Each item is scored on a five-point scale (5 - All the time; 4 - Most of the time; 3 - Some of the time; 2 - A little of the time; 1 – None of the time). Possible values range from 10 to 50. To calculate the total scores, the five-point scale should initially be inverted and, later, the sum of the answers[16]. A study conducted with European elderly people suggests cut-off point of 15 or more points to consider mental distress, 19 to 22 for minor depression and ≥ 23 points for major depression[17].

However, it is believed that Brazilian elderly people have different characteristics from Europeans. Thus, in this study, the cut-off point that best represented the occurrence of mental distress in the elderly population was found, with the SRQ - 20 as a gold standard.

Data analysis and statistics

Data were organized in an Excel software spreadsheet, double entered, and analyzed with the help of SPSS, version 26.0, and MedCalc. Analysis took place through absolute and relative frequencies, descriptive and analytical statistics. Concerning the reliability of the K10 scale, Cronbach's alpha coefficient (α) was used for the instrument's internal consistency. Internal consistency - or homogeneity - indicates whether items on an instrument measure the same characteristic[20]. Alpha values greater than or equal to 0.80 indicate that the instrument is reliable[28].

This scale's validity was verified through criterion validity, based on comparison between K10 scores and SRQ - 20 scores (concurrent validity). Criterion validity means the relationship between scores of a given instrument and some widely accepted external criterion, with the same characteristics as the instrument under test, which is considered a gold standard or an established criterion. The instrument is considered valid when its scores correspond to the scores of the chosen criterion[20]. Spearman's rho correlation coefficient (ρ) was applied to verify this property. Correlation values greater than or equal to 0.40 suggest adequate correlation[29]. Additionally, the cut-off point of K10 was verified for screening mental distress in the elderly population through ROC Curve (Receive Operator Characteristic) analysis, sensitivity, specificity measures and the respective 95% Clopper - Pearson Confidence Intervals (CI). Area Under The Curve (AUC) with a value greater than or equal to 0.80, high sensitivity (true positive) and specificity (low percentage of false positive) indicate adequate test accuracy to measure a certain phenomenon[23].

To verify the association between variables, the chi-square test was used at the expected frequencies less than 20 and greater than five, or Fisher's exact test at the expected frequencies less than five. The Kolmogorov-Smirnov test was applied to verify the adherence of quantitative variables to the normal distribution, whose values showed that the variables age, years of schooling, family income, SRQ - 20 and K10 scores did not present a normal distribution. Thus, the Mann-Whitney U test was used to verify the difference in median instrument scores (SRQ - 20 and K10) between the groups. A significance level (α) of 5.0% was adopted.

RESULTS

The elderly people's age ranged from 60 to 76 years. The mean was 66.21 years (± 4.22). The most frequent age groups were 60 to 64 years (n=29; 39.7%) and 65 to 69 years old (n=26; 35.6%). There was a predominance of women 79.5% (n=58). As for education, the mean was 4.78 years (± 0.63) and 50.0% of the sample had up to four years of study. Family income ranged from R$ 300.00 to R$ 9,000.00 (about US$60 and 1,800). More than half (n=39; 53.4%) receive a minimum wage. Most are retired (n=53; 72.6%). The total internal consistency of K10 was α=0.844 (Table 1), which shows high reliability. The exclusion of any item substantially increased the alpha value. Therefore, the exclusion of any of them is not recommended and it is ensured that they measure the same phenomenon - mental distress - in a homogeneous way.

Concurrent validity between K10 and SRQ - 20 was ρ=0.722 (p <0.001), which indicates a strong correlation between these instruments and K10 validity to measure mental distress, with a gold standard SRQ - 20. Analysis of the cut-off points of the scale showed AUC equal to 0.865 (95% CI: 0.764 - 0.933; p<0.0001), which shows adequate scale precision for screening mental

distress. Concerning analysis of K10 scores, the best cut-off point for screening mental distress among elderly people (Table 2) was a total score greater than 14, with sensitivity equal to 75.47% and specificity equal to 85.0%. It is observed that a cut-off point greater than 13 also showed high sensitivity and specificity, however the CI of these measures were higher, in addition to the lower limit of specificity being close to 50.0%. Therefore, based on these results, from a cut-off point greater than 14, it is possible to correctly screen 75.47% of cases of mental distress, with a false positive rate of 15.0%.

Table 1 - Reliability of the Kessler Psychological Distress Scale for elderly people assisted in Primary Care (n=73), Vitória de Santo Antão, Pernambuco, Brazil, 2018

Kessler Psychological Distress Scale Items - K10	α*	α**
		0.844
1. In the past 4 weeks, about how often did you feel tired out for no good reason?		0.839
2. In the past 4 weeks, about how often did you feel nervous?		0.837
3. In the past 4 weeks, about how often did you so feel nervous that nothing could calm you down?		0.837
4. In the past 4 weeks, about how often did you feel hopeless?		0.839
5. In the past 4 weeks, about how often did you feel restless or fidgety?		0.834
6. In the past 4 weeks, about how often did you feel so restless you could not sit still?		0.834
7. In the past 4 weeks, about how often did you feel depressed?		0.818
8. In the past 4 weeks, about how often did you feel that everything was an effort?		0.824
9. In the past 4 weeks, about how often did you feel so sad that nothing could cheer you up?		0.819
10. In the past 4 weeks, about how often did you feel worthless?		0.814

Note: * Total Cronbach's alpha of the scale; **Total Cronbach's alpha of the scale if that item is excluded.

Concerning the results of mental illness in elderly people, the mean of points in the SRQ - 20 was 7.18 (± 4.07) and the median was 6.0 points. A percentage of 72.6% (n=53) presented a score suggestive of CMD. These pictures were associated with mental distress (p <0.001 - Fisher's exact test; OR=17.436; CI - 4.397 - 69.145) so that elderly people with mental distress are 17.436 times more likely to develop CMD. On the K10 scale, the mean of points was 16.56 (± 5.84) and the median was 15.0. Mental distress was found in 58.9% (n=43) of participants. Cases suggestive of depression were found in 15 participants (20.5%), of which seven (9.6%) are suggestive of major depression and 13 of minor depression (17.8%).

Mental suffering was associated with an income lower than the minimum wage, retirement and most of items in the SRQ - 20, with an emphasis on nervousness/tension/worry, sadness, frequent crying, frequent tiredness and unpleasant feelings in the stomach. Such signs/symptoms substantially increased the chances of developing mental distress (Table 3).

Table 2 – Cut-off points of the Kessler Psychological Distress Scale for screening mental distress in elderly people (n=73), Vitória de Santo Antão, Recife, 2018

K10 score	Sensitivity (%)	95% CI	Specificity (%)	95% CI
≥10	100.00	93.3 - 100.0	0.00	0.0 - 16.8
>10	100.00	93.3 - 100.0	20.00	5.7 - 43.7
>11	98.11	89.9 - 100.0	35.00	15.4 - 59.2
>12	90.57	79.3 - 96.9	60.00	36.1 - 80.9
>13	83.02	70.2 - 91.9	75.00	50.9 - 91.3
>14	75.47	61.7 - 86.2	85.00	62.1 - 96.8
>15	58.49	44.1 - 71.9	90.00	68.3 - 98.8
>16	45.28	31.6 - 59.6	90.00	68.3 - 98.8
>17	39.62	26.5 - 54.0	95.00	75.1 - 99.9
>18	35.85	23.1 - 50.2	95.00	75.1 - 99.9
>19	28.30	16.8 - 42.3	100.00	83.2 - 100.0
>41	0.00	0.0 - 6.7	100.00	83.2 - 100.0

Note: Sensitivity (S); Specificity (Sp); Clopper Confidence Interval - Pearson (95% CI).

Table 3 - Factors associated with mental distress in elderly people in Primary Care (n=73), Vitória de Santo Antão, Pernambuco, Brazil, 2018

Independent variables	Mental distress		p value*	OR**	95% Confidence Interval	
	Yes	No			Lower limit	Upper limit
Income less than a minimum wage						
Yes	6	0	0.039	--	--	--
No	37	30				
Retirement						
Yes	26	27	0.005	0.170	0.044	0.649
No	17	3				
Difficulty sleeping***						
Yes	32	15	0.032	2.909	1.080	7.834
No	11	15				
Scare easily ***						
Yes	25	9	0.018	3.241	1.206	8.707
No	18	21				
Hand tremors ***						
Yes	15	3	0.015	4.821	1.253	18.554
No	28	27				
Nervousness/tension/concern***						
Yes	39	13	<0.001	12.750	3.627	44.819
No	4	17				
Digestion difficulties***						
Yes	24	9	0.029	2.947	1.100	7.900
No	19	21				
Sadness***						
Yes	19	2	<0.001	11.083	2.339	52.517
No	24	28				
Frequent crying***						
Yes	18	3	0.003	6.480	1.700	24.694
No	25	27				
Loss of interest in life***						
Yes	13	0	0.001	--	--	--
No	30	30				
Frequent tiredness***						
Yes	17	1	<0.001	18.962	2.357	152.553
No	26	29				
Tired from small efforts***						
Yes	30	13	0.011	3.462	1.301	9.208
No	12	18				
Unpleasant feelings in the stomach ***						
Yes	31	12	0.013	3.378	1.265	9.025
No	13	17				

Notes: *Chi-square test; **OR - Odds Ratio; *** SRQ Item - 20.

As for risk of suicide, about 16.43% reported that they have already thought about taking their own lives. This phenomenon was associated with pictures suggestive of CMD (p=0.029 - Fisher's

exact test), mental distress (p=0.012 - Fisher's exact test; OR=9.969; CI: 1.211 - 82.051), pictures suggestive of depression (p < 0.001 - Fisher's exact test; OR=27,500; CI: 5.809 - 130.189), especially for major depression (p <0.001 - Fisher's exact test; OR=60,000; CI: 6.154 - 585.003).

Mental distress increased the chance of having suicidal thoughts/suicide risk by approximately ten times; and people with symptoms suggestive of major depression are 60,000 times more likely to have a suicidal ideation/risk of suicide. Thus, relationships of this thought with items from the SRQ - 20 were demonstrated, namely: sadness (p <0.001 - Fisher's exact test; OR=12.250; CI: 2.870 - 52.283); frequent tiredness (p <0.001 - Fisher's exact test; OR=10,200; CI: 2,570 - 40,480); unpleasant feelings in the stomach (p=0.009 - chi-square test; OR=10.645; CI: 1.293 - 87.607); difficulty making decisions (p=0.007 - chi-square test; OR=7,200; CI: 1,451 - 35,720); difficulty to perform ADL (p=0.010 - Fisher's exact test; OR=5.717; CI: 1.543 - 21.183); inability to play a useful role in life and loss of interest in life (p=0.032 - Fisher's exact test; OR=4.732; CI: 1.206 - 18.574).

As for the differences in K10 and SRQ - 20 scores between groups (Table 4), women, retirees, elderly people with a suicidal ideation and with pictures suggestive of CMD had significantly higher scores related to mental distress. Concerning SRQ - 20 scores, there were higher mean positions among women, people with a suicidal ideation, mental distress, indications of depression and major depression.

Table 4 - Differences in the mean points of the Kessler Psychological Distress Scale scores between groups of elderly people in Primary Care (n=73), Vitória de Santo Antão, Pernambuco, Brazil, 2018

Variables	Median	Mean scores	p value*
Scores (K10)			
Sex			
Male	13.0	25.63	0.019
Female	15.0	39.94	
Retirement			
Yes	14.0	33.61	0.026
No	16.5	45.98	
Suicide risk			
Yes	22.5	58.67	<0.001
No	15.0	32.74	
Common Mental Disorder			
Yes	16.0	44.29	<0.001
No	12.0	17.68	
Scores (SRQ - 20)			
Sex			
Male	5.0	25.33	0.016
Female	6.5	40.02	
Suicide risk			
Yes	14.0	62.58	<0.001
No	6.0	31.97	
Mental distress			
Yes	8.0	48.19	<0.001
No	4.0	20.97	
Major depression			
Yes	16.0	66.00	<0.001
No	6.0	33.92	
Minor depression			
Yes	9.0	48.23	0.034
No	6.0	34.57	

Note: *Mann-Whitney U test.

DISCUSSION

Estimates about the Brazilian population aging indicate that in 2040 there will be 25,811,887 elderly people in Brazil, aged 60 to 69 years old, and 28,393,007 over 70 years old[30]. These data are similar to those found in other countries, where there is an increase in older elderly people, especially those over 70 years old[31]. In this study, there was a predominance of young elderly people aged 60 to 69 years, women, retired and with a monthly income of one to two minimum wages. This profile is similar to the reality of other municipalities in Brazil[9,32].

As for the K10 scale's validity and reliability, it proved to be valid and reliable for identifying mental distress in elderly people. It presented high reliability similar to another validation study carried out with Portuguese elderly[19]. The general scale and its respective items showed high internal consistency, which indicates that they measure the same phenomenon consistently. It was observed that K10 showed a significant correlation with the SRQ - 20, a gold standard questionnaire to screen CMD/mental illness, which indicates concurrent validity. Other studies have also shown adequate validity of the K10 scale for the elderly population[17-18].

Furthermore, the scale showed high precision for screening mental distress in this population, given the high area under ROC curve, whose best cut-off point (<14) was similar to that found in a previous study (≥15 points)[17]. The authors[20] have highlighted the need for a careful validity assessment of measurement instruments, in order to enable the choice of appropriate and accurate instruments capable of guaranteeing reliable results, since the quality of the information by the instruments depends, in part, on its psychometric properties. Thus, it is observed that the results found in this research regarding mental illness and suicide risk are robust, given the psychometric properties shown.

The prevalence of suicidal ideation was high and showed a significant association with mental distress, pictures suggestive of major depression and CMD. Suicide among elderly people is a serious public health concern worldwide. Researchers have shown that death rates by suicide in Brazil increased from 1990 to 2015, with important changes in their spatial distribution. Thus, 205,431 suicide deaths were reported between 1991 and 2015, or the rate of 5.3 deaths per 100 thousand inhabitants, which shows a mean of one suicide every 64 minutes in Brazil. The rates that previously were concentrated in the South included, over time, municipalities in the Center-West, North and Northeast[33]. The researchers claim that this increase may be related to the improvement in the quality of notifications about mortality that occurred over the past few years in Brazil[33-34].

A longitudinal research in Sweden found a prevalence of suicidal ideation of 4.8% in the last week, 6.7% in the last 30 days, 11.2% in the last year and 25.2% throughout life[31]. A survey in northeastern Brazil showed that 3.9% of elderly people thought about taking their own lives[9]. The associated factors were similar to those evidenced in literature[13,35-36], such as mental distress, pictures suggestive of CMD, depression, difficulties to think clearly and to make decisions, sadness, frequent crying, feeling of uselessness, loss of interest in life and gastrointestinal changes. Most suicides are related to psychiatric illnesses, of which depression, substance abuse and psychosis are the most relevant risk factors[6,37-38]. However, anxiety, disorders

related to personality, diet and trauma, in addition to organic mental disorders, also contribute to the occurrence of suicide[39]. Another study carried out with elderly people in Teresina City identified fragile affective relationships, meaningless life, depression, alcohol abuse, impulsive-aggressive personality traits and previous suicide attempts as factors associated with suicide attempts[40], which corroborates the results presented in the study.

High prevalence of CMD and mental distress among the elderly people in this research stands out, in comparison with previous studies[9,32]. Moreover, this research found an association between gender and CMD. Higher scores were observed in the SRQ - 20 and K10 in the groups of women, people at risk of suicide and with major depression. Studies have shown that CMDs tend to be more frequent among women and among the poorest[41-42]. Furthermore, women are at a higher risk for presenting symptoms suggestive of major depression when compared to men[31]. Some authors argue that there are aspects that increase the vulnerability of women to CMD and/or mental distress, with emphasis on socioeconomic and structuring conditions of life that, influenced by unequal gender relations, interact in order to increase and/or explain this susceptibility among women. In this perspective, it is believed that traditional female roles such as the role of wives, mothers, daughters and grandparents, as well as that of caregiver, when combined with social factors that involve unemployment, situations of violence and precarious living and health conditions, contribute to mental illness of women[42].

An integrative review found an association of suicide or suicidal ideation in elderly people who manifested anxiety, depressive symptoms, depression, physical illnesses, low education, low socioeconomic status, and chronic illnesses[43]. Literature is unanimous in finding higher rates of depression in elderly people with suicidal thoughts[31,44]. Depression can appear as a symptom or as a way of adapting to loss of autonomy and emergence of chronic diseases that impact elderly people's quality of life.

Considering the above, using the K10 instrument in elderly people by PHC nurses is a powerful strategy for early screening of mental distress. Furthermore, applying this instrument in nursing practice can make nurses feel prepared to provide comprehensive care for elderly, valuing not only the disease, but mainly, the circumstances in which the symptoms occur for the elaboration of qualified interventions directed to the reality of these individuals.

Study limitations

Among the limitations of the study, we can highlight the design of the cross-sectional study, which does not allow assessment of cause and effect between variables studied and the small sample size. Additionally, the research consisted of a convenience sample, with elderly people who use PHC services, making it impossible to generalize information to the elderly population in other contexts. It is suggested to investigate the K10 scale's psychometric properties in population-based epidemiological studies in other care contexts in order to enable the refinement of the aforementioned instrument for mental distress screening in the elderly population.

Contributions to nursing, health, and public policy

The results of this study contribute to increase nurses' practice in community mental health, by providing a valid and reliable instrument. They also contribute to planning therapeutic strategies for mental health care for elderly people, in order to prevent emotional suffering and suicidal behavior. Thus, the study presents important contributions in public health, gerontology, mental health, and nursing.

CONCLUSION

The K10 scale proved to be valid and reliable for verifying mental distress in elderly people in PHC. Moreover, this phenomenon was associated with income less than a minimum wage, retirement, suicidal ideation and SRQ - 20 items, especially nervousness, sadness and frequent tiredness. Elderly people with mental distress were more likely to develop CMD. A high percentage of suicidal thoughts was observed. Among the variables related to this phenomenon, mental distress and major depression considerably increased the chance of suicidal ideation in elderly people. There were statistically significant differences regarding the scores in the SRQ - 20 (women, elderly people with suicidal thoughts and major depression) and in K10 (elderly women, elderly people without retirement, with suicidal thoughts and with major depression), which indicates the need for nursing interventions to address these specificities with a view to achieving better mental health outcomes.

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