Research, Society and Development, v. 13, n. 2, e10613245107, 2024
(CC BY 4.0) | ISSN 2525-3409 | DOI: http://dx.doi.org/10.33448/rsd-v13i2.45107

Systematic Review of the use of Depression Anxiety Stress scale 21(Dass-21) in the elderly: Practical applicability across countries

Revisão Sistemática do uso da escala de Depressão Ansiedade e Estresse 21 (Dass-21) em idosos: Aplicabilidade prática entre países

Revisión Sistemática del uso de la escala de Depresión Ansiedad y Estrés 21 (Dass-21) en personas mayores: Aplicabilidad práctica entre países

Received: 02/12/2024 | Revised: 02/19/2024 | Accepted: 02/20/2024 | Published: 02/24/2024

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Abstract
The aim was to identify the practical applicability of the Depression, Anxiety and Stress scale (DASS-21) in elderly across countries. Online database searches (EMBASE, PubMed, SciELO) were performed to identify sample characteristics, the purpose of using this scale, and the location of participant recruitment. The search terms included “Aged” OR “Elderly” with the term "dass 21” OR “depression, anxiety, stress scale-21”. The initial data search yielded 855 studies, 833 were excluded. Finally, 22 full-text were analyzed for the study purposes, developed in 13 different countries, including 14,339 participants. The samples were composed predominantly of women, with ages ranging between 60 and 91 years. DASS-21 was used in clinical and non-clinical elderly. The findings have demonstrated that the DASS-21 is useful in monitoring depression, anxiety, and stress in this population across.
Keywords: Aged; Depression; Anxiety; Stress; Mental health.

Resumo
O objetivo foi identificar a aplicabilidade prática da escala de Depressão, Ansiedade e Estresse (DASS-21) em idosos em todos os países. Pesquisas on-line em bancos de dados (EMBASE, PubMed, SciELO) foram realizadas para identificar as características da amostra, a finalidade do uso dessa escala e o local de recrutamento dos participantes. Os termos de pesquisa incluíram “Idoso” OR “Idoso” com o termo "dass 21” OR “depressão, ansiedade, escala de estresse-21”. A pesquisa inicial de dados rendeu 855 estudos, 833 foram excluídos. Por fim, 22 textos completos foram analisados para fins do estudo, desenvolvido em 13 países diferentes, incluindo 14.339 participantes. As amostras foram compostas predominantemente por mulheres, com idades variando entre 60 e 91 anos. A DASS-21 foi utilizada em idosos clínicos e não clínicos. Os resultados demonstraram que o DASS-21 é útil no monitoramento da depressão, ansiedade e estresse nesta população em todos os países.
Palavras-chave: Idoso; Depressão; Ansiedade; Estresse; Saúde mental.

Resumen
El objetivo fue identificar la aplicabilidad práctica de la escala de Depresión, Ansiedad y Estrés (DASS-21) en personas mayores de todos los países. Se realizaron búsquedas en bases de datos en línea (EMBASE, PubMed, SciELO) para identificar las características de la muestra, el propósito del uso de esta escala y el lugar de reclutamiento de los participantes. Los términos de búsqueda incluyeron "Aged" OR "Elderly" con el término "dass 21" OR "depression, ansiedad, stress scale-21". La búsqueda de datos inicial arrojó 855 estudios, 833 fueron excluidos. Finalmente, se analizaron 22 textos completos. Para los fines del estudio, desarrollado en 13 países diferentes, incluidos 14.339 participantes. Las muestras estaban compuestas predominantemente por mujeres, con edades comprendidas entre 60 y 91 años. DASS-21 se utilizó en ancianos clínicos y no clínicos. Los hallazgos han demostrado que el DASS-21 es útil para monitorear la depresión, la ansiedad y el estrés en esta población en todos los países.
Palabras clave: Anciano; Depresión; Ansiedad; Estrés; Salud mental.

1. Introduction

The United Nations defined older people as someone over 60 years old. The World Health Organization (WHO) defines the elderly as people 65 years or older (UN, 2017). However, aging is also a social construct based on custom, practice, and perceptions of the roles people play in their communities (UNHCR, 2018).

Declining mortality rates are influencing this increase in life expectancy. In 2019, there were 1 billion people aged 60 and over worldwide, by 2030 it is expected to rise to 1.4 billion, and by 2050 this population will almost double from 12 to 22%, with 2.1 billion elderly worldwide. This number increase is unprecedented and not slowing (Iracema de Lima et al., 2016; WHO, 2022).

Evidence suggests that the elderlies are more prone to have impaired mental health, such as depression, anxiety, and stress, requiring prompt intervention, considered the main cause of emotional distress and decreased quality of life (Zhao et al., 2021).

Depression is a global public health problem, considered one of the most disabling and prevalent disorders in the elderly, and it is strongly associated with low self-esteem, lack of interest in daily activities, insomnia, and suicide (Kerkez & Erci, 2024).

Likewise, anxiety is increasingly experienced in the elderly. Characterized by an exacerbated and persistent response to anticipating a threat or future situation. It is also associated with insomnia, fear, guilt, palpitations, restlessness, tachycardia, and tremors (APA, 2014).

Stress is common in people's lives, but chronic or high levels may be related to impaired mental health (Lazarus & Folkman,1987). Among the elderly, stress is related mainly to living conditions and can be characterized by manifestations in the cognitive and emotional scope (Yaka et al., 2014). It also can affect concentration, memory, social relationships, and sleep (Foster, 2020; Pujar & Badami, 2022).

There are numerous tools for assessing mental health, and the Depression, Anxiety Stress Scale, commonly known as the DASS is one of the most widely used tools for simultaneously evaluating these three variables (Lovibond & Lovibond, 1995).

The DASS was first created in the English language, with 42 items in three categories, your reduced version was developed with 21 items, the DASS-2, and has been widely used to assess affective symptoms across different age groups, including adolescents, adults, and the elderly (Zhao et al., 2021; Pujar & Badami, 2022).

The 21 items are equally divided among three dimensions: depression, anxiety, and stress, with seven items on each scale. With a Likert-type scale assessed from 0 (not at all) to 3 (very frequently or usually) points. The scores for each scale are determined by summing the scores of the seven items, which contains one final score for each subscale, with a minimum of

"0" and a maximum of "21". The highest scores on each scale correspond to the most negative affective states (Lovibond & Lovibond, 1995).

The DASS-21 has been extensively used across multiple ages, groups, and countries. However, its use in the elderly has not been well established and these studies did not specifically report on its use with the elderly.

This systematic review aims to identify the practical applicability of the DASS-21 in the elderly across countries.

2. Methodology

This systematic review was carried out based on seven steps: (1) formulation of the question, (2) location and selection of studies (3) critical evaluation of studies (4) data collection, (5) analysis and presentation of data, (6) interpretation of data and (7) improvement and updating of the review (Higgins & Green S, 2011).

To ensure rigorous methodological quality and scientific relevance, this systematic review was developed following the recommendations of the Items of Preferential Reports for Systematic Review and Meta-Analysis – PRISMA (Page et al., 2021).

The systematic review question was constructed according to the PICO, Patient, Intervention, Comparison, and Results strategy. This study seeks to answer the following question: what is the use (CR) of the DASS-21 scale (I) in older people (P)?

The full-text searching was with a health sciences librarian to identify search terms and databases that would best address our systematic review question. It included studies published without time limitations regarding year of publication on the evaluation of the results of DASS-21 in elderly over 60 years of age. Literature reviews and reports of professional experience were excluded. The articles were identified through searches in the electronic databases EMBASE, PubMed, and SciELO.

Search strategy and selection

The systematic review search strategy included the terms "Aged" OR "Elderly" in combination with the term "dass 21" OR "depression, anxiety, stress scale-21." The articles were initially identified through search PubMed (http://www.pubmed.gov) using the following combination of words: "Aged" with the term "dass 21", which identified 466 studies. Afterward, bibliographic searches were performed in the EMBASE database, using the combination of words: "Aged" AND "depression, anxiety, stress scale-21", which identified 349 articles, and in the SciELO using the following combination of words: "EDERLY" AND "DASS-21", which identified 40 articles. As such, 855 studies were identified for critical analysis.

Quality criteria of the selected articles

The selection process identified that the studies applied different research methodologies. Two reviewers independently assessed the risk of bias in the included studies.

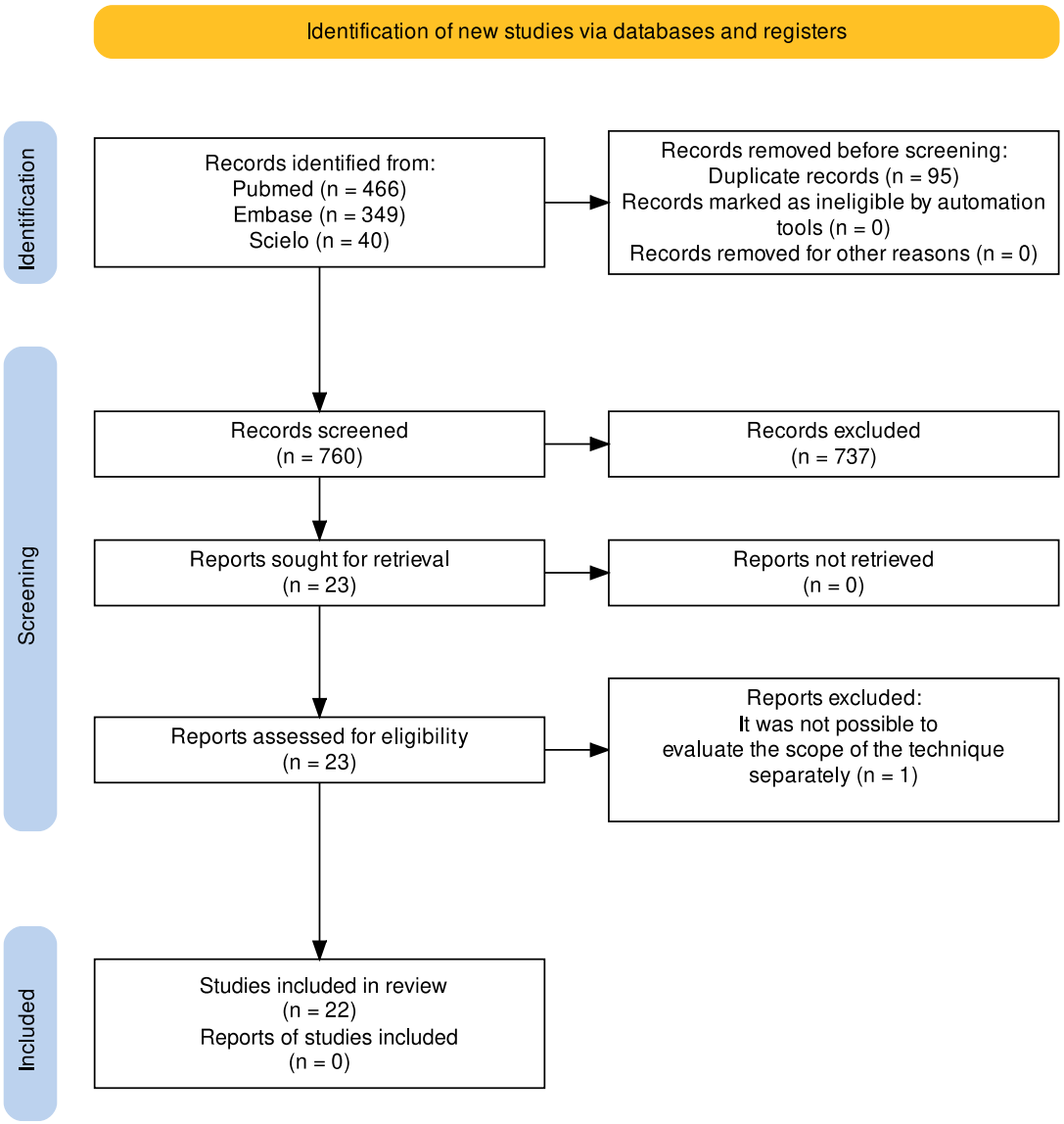
Studies were evaluated for bias using the Joanna Briggs Institute (JBI) Critical Appraisal Tool (Tufanaru et al., 2020). The level of methodological quality was determined as follows: reasonable quality = less than 40% of the presented items; moderate quality = between 41 and 80% of the presented items and good quality = more than 80% of the presented items. In the critical evaluation of the methodological quality of the included articles, one of the RCTs (Troeung &Egan, 2014) adopted good quality and two displayed moderate quality (Gloster et al., 2008; Chojak, 2022). The studies were classified as having a moderate risk of bias because they did not describe the blinding of the research team responsible for analyzing the outcomes, the absence of double-blinding, and the losses that occurred during the treatment. As for the quasi-experimental studies, all showed good methodological quality (Sharifirad et al., 2013; Piadehkouhsarorcid et al.; Gholamzade et al., 2019).

Study selection

The search outcomes in the databases resulted in 855 articles, of which 95 studies were duplicated, leaving 760 for analysis. After a detailed evaluation of the titles, abstracts, and the application of the eligibility criteria, articles that did not include elderly over 60 years old or those that also evaluated a sample of people with different ages were excluded, because it was not possible to categorize the results of the DASS separately. Then, 23 studies were selected for a complete revision of the text.

At this stage, one article was deleted because it was not possible to evaluate the scope of the Approach (Foran & Mathias, 2021). Finally, this systematic review was composed of 22 articles. Figure 1 identifies the strategies during the selection of the articles and describes the exclusion factors used in each step.

Figure 1 - Flow Diagram for scoping review process adapted from the PRISMA statement.



Source: Authors.

3. Results

Descriptive analysis of included studies

22 studies were included in this review, of which 11 were descriptive, 4 retrospective cohort, 3 randomized clinical

trials, 2 quasi-experimental, 1 experimental, and 1 case-control. All studies found were published in English in the last 14 years (between 2008 and 2022). The studies included 14,339 participants: 9321 women (65%) and 5018 men (35%), aged between 60 and 91 years (mean = 68.5 years). A detailed description of the articles and their main findings are shown in Chart 1.

Chart 1 - Summary of characteristics identified in the selected articles, including the main results (N =22).

Continent	Country	DASS Language version	Design	Author	Study Context	Objective	Study finding
Africa	Nigeria	Igala	Descriptive	Igbokwe et al., 2020	Community	To examine the association between perceived loneliness, depression, and anxiety symptoms, among retirees.	The prevalence of loneliness, depression, anxiety, and anxious depression was relatively high among elderly retirees. Female gender and advanced age were significantly associated with perceived loneliness, depression, and anxiety.
Asia	China	Chinese	Descriptive	Xiao et al., 2021	Community	To explore the role played by activities in daily living and perceived social support.	Chronic diseases had a direct effect on psychological distress in elderly; the relationship between chronic diseases and psychological distress was partially mediated by ADL, and the impact of chronic diseases on psychological distress was moderated by perceived social support.
	China	English	Descriptive	Li, Kong, 2022	Community	To explore the relationship between depression, anxiety, stress, morbidity, and oral health-related quality of life in the migrant elderly	Regarding depression, anxiety, and stress, the results indicated that the fewer morbidities, the lower the level of depression and anxiety and the better the oral health-related quality of life.
	China	English	Descriptive	Zhang et al., 2022	Community	To examine the mediating role of negative emotions and the moderating role of perceived social support in the relationship between sleep quality and subjective well-being.	Negative emotions increased the negative association between sleep quality and subjective well-being and perceived social support played a moderating role.
	India	English	Descriptive	Pathak, Manapurat, 2021	Community	To compare two psychometric Scales to detect Depression among the elderly residing in a Slum area.	The DASS and GDS were both easy and reliable scales in judging depression among the old population. The DASS appeared to be more specific and GDS appeared to be more sensitive in judging depression. The agreement between the scales at the designated cut-off is very good and the identified prevalence was almost similar.

	Tehran	English	Quasi-experimental	Sharifirad et al, 2013	Community	To determine the effect of educational intervention based on the preceding model on the stress level of the elderly and to control stress factors.	The findings showed significant differences between the experimental group and control group in terms of predisposing factors of knowledge and attitude, enabling factors, reinforcing factors, and functioning especially in deep breathing and relaxation techniques. Mean scores and severity of stress were significant after the intervention.
	Tehran	Persian	Descriptive	Kushkestani et al., 2021	Nursing homes	To examine the risk factors associated with poor sleep quality in the elderly.	Poor sleepers exhibited lower physical activity levels, undernutrition, and higher stress levels. In this way, regular physical activity, nutritional and stress status are likely important mediating factors influencing the sleep quality of elderly.
	Tehran	Persian	Experimental	Piadehkoet al., 2019	Nursing homes	To analyze the effect of the orientation program based on activities of daily living on depression, anxiety, and stress in the elderly.	The orientation program based on activities of daily living was effective in depression, anxiety, and stress in the elderly.
	Iran	Persian	Quasi experimental	Gholamzadeh et al., 2019	Elderly daycare	To determine the effects of the continuous care model (CCM) on depression, anxiety, and stress in the Iranian elderly in Shiraz.	The implementation of CCM not only reduced psychological problems in the elderly but also improved and strengthened their psychological condition.
	Iran	Persian	Cohort	Alavi et al., 2017	Health service	To assess the role of psychosocial factors in predicting readmission among diabetic elderly hospitalized	During 3 months after discharge, 44% of hospitalized diabetic elderly were readmitted. Among predicting factors, depression and social support had the most and the least important roles in predicting readmission rates, respectively.
	Malaysia	English	Case-control	Mat et al., 2017	Health service	To investigate the role of fear of falling (OfF) and psychological symptoms in the relationship between osteoarthritis symptoms severity and falls.	Older fallers with osteoarthritis had an increased FoF and depressive symptoms compared to non-fallers. It was noticed a relationship between FoF, depression, anxiety, and stress with osteoarthritis symptom severity among fallers.
Europe	Germany	English	Clinical trial	Gloster et al., 2018	Health service	To examine the psychometric properties of the DASS-21 in a population of elderly seeking help for worry in a primary care setting.	The results indicated good internal consistency, excellent convergent validity, and good discriminative validity, especially for the Depression scale.
	Poland	English	Clinical Trial	Chojak, 2022	Health service	To assess the effectiveness of psychological skills training in lowering psychopathological	Depression and anxiety decreased in the experimental group. The level of quality of life increased during the month, again, only in the

						symptoms and increasing the quality of life.	experimental group. The mental state level did not significantly moderate the aforementioned changes.
	Spain	Spanish	Descriptive	Picaza et al, 2020	Community	To examine the levels of stress, anxiety, and depression in people over 60 years of age at the time of the COVID-19 outbreak.	Most of the participants did not report levels of stress, anxiety, and depression. Among participants aged 66 and above and those with chronic illness, a proportion reported experiencing one, two, or all three of these symptoms.
	Spain	Spanish	Descriptive	Bobes-Bascarán et al., 2020	Community	To examine the early psychological correlates associated with the COVID-19 pandemic and lockdown on the mental health of a Spanish older adult.	Avoidant and depressive styles were the most prevalent in this elderly sample. The main protective factor in all subgroups was the ability to enjoy free time, whereas the main risk factors were being a female and current or past history of mental disorder.
	Turkiye	Turkish	Descriptive	Arpacıoğlu et al., 2021	Nursing home and community	To investigate the levels of depression, anxiety, death anxiety, and life satisfaction in individuals aged 65 years and older during the pandemic.	The majority of the elderly had no or mild depression, anxiety, and stress symptoms despite the prolonged confinements, and were slightly satisfied with their lives. Residents of the nursing home had higher death anxiety, depression, and anxiety levels, and lower life satisfaction levels than community-dwelling elderly.
Australia	Australia	English	cohort	Wood et al., 2016	Health service	To examine the role of catastrophizing in mediating the relationship between pain intensity and depressed mood in older adults with persistent pain.	The significant relative magnitude of beta between pain intensity and depression reduced and became non-significant after introducing magnification as a mediating variable, whilst the significant relative magnitude of beta reduced and also became non-significant after introducing helplessness as a mediating variable
	Australia	English	Clinical trial	Troeung & Egan, 2014	Health service	To evaluate the efficacy of a group Cognitive Behavioural Therapy (CBT) treatment for depression and anxiety in Parkinson's disease.	The participants who received CBT reported greater reductions in depression than Waitlist participants. Large secondary effects on anxiety were also observed for CBT participants.
South America	Brazil	Portuguese	Cohort	Martins et al., 2022	Health service	To investigate the influence of positive behaviors, attitudes, and values on mental health.	The results revealed that positive behavioral factors influenced mental health as much as traditional factors and should therefore be addressed by health professionals and medical managers.
	Brazil	Portuguese	Cohort	Correa et al., 2022	Community	To investigate whether altruism and volunteering are associated with cognitive functioning	Altruism and volunteering were associated with cognitive tests. Volunteering was associated with lower cognitive decline. However,

						in community-dwelling elderly.	altruism was associated with higher absolute scores on these tests.
	Brazil	Portuguese	Descriptive	Bertocchi et al., 2022	Community	To assess mobile technology use, the level of digital addiction, and the association of these factors with physical, mental, and social health and quality of life.	No differences were observed between groups for depression, anxiety or stress symptoms, quality of life, sleep disturbances, or loneliness. Among smartphone users, the degree of digital addiction was correlated with better physical and environmental conditions, to the detriment of poorer sleep quality.
	Ecuador	Spanish	Descriptive	Del Brutto et al., 2014	Community	To assess the relationship between cognitive status and self-reported symptoms of depression, anxiety, and stress of elderly living in an underserved rural population.	It was found that depression and anxiety were associated with poorer cognitive performance in elderly residents living in rural areas.

Source: Authors.

Study setting and DASS-21 language across countries

Within the research framework and the application of the DASS-21 instrument, noteworthy investigations carried out in various regions of the world have expanded our understanding. An exceptional study concerning the elderly in Africa focusing on the use of the DASS-21 instrument in the indigenous Nigerian language, Igales (Igbokwe et al., 2020). Ten studies were identified in Asia, with three conducted in China where the DASS-21 was administered both in its original English version (Xiao et al., 2021) and translated into Chinese (Zhang et al.; Li & Kong, 2022). Additionally, a study employed the original English version in India (Pathak & Manapurath, 2021). In Iran, two studies utilized the Persian translation of the instrument (Gholamzadeh et al., 2019; Alavi et al., 2017), while other researchers employed both the original English version (Sharifirad et al., 2013), and a Persian translation (Piadehkouhsarorcid et al., 2019; Kushkestani et al., 2021). Furthermore, a study in Malaysia used the DASS-21 in its original English format (Mat et al., 2017).

Five studies were conducted in Europe: one in Germany (Gloster et al., 2008), and Poland (Chokaj, 2022) using the original English version, two in Spain utilizing a Spanish translation (Picaza et al.; Bobes-Bascarán, 2020), and one in Turkey employing a Turkish translation (Arpacıoğlu et al., 2021).

In Australia, both Australian studies utilized the original English version of the DASS-21 (Troeung & Egan, 2014; Wood et al., 2016).

In South America, four studies were identified. All studies conducted in Brazil employed the DASS-21 in Portuguese translation (Martins et al.; Correa et al.; Bertocchi et al., 2022), while in Ecuador, the instrument was used in Spanish translation (Del Brutto et al., 2014). This comprehensive global exploration demonstrates the diverse linguistic applications of the DASS-21, reflecting its adaptability across different cultural contexts.

Recruitment across countries

Concerning the recruitment site, in Africa, a Nigerian study took place in the community (Igbokwe et al., 2020). In Asia, studies from China and India were performed in the community (Zhang et al.; Li & Kong, 2022; Xiao et al.; Pathak & Manapurath, 2021). In Iran, the study was performed in the community (Sharifirad et al., 2013), and nursing homes

(Piadehkouhsarorcid et al.; Gholamzadeh et al., 2019; Kushkestan et al., 2021). In Malaysia, the study was in a healthcare service (Mat et al., 2017).

In Europe, studies from Germany (Gloster et al., 2008) and Poland (Chokaj, 2022) were carried out in health care services; all Spanish studies were in the community (Bobes-Bascarán et al.; Picaza et al., 2020) and a Turkish study was both in a nursing home and community (Arpacıoğlu et al., 2021).

Regarding Australian studies, took place in healthcare services (Troeung & Egan, 2014; Wood et al., 2016). In South America, Brazilian studies were in health care services (Martins et al.,2022) and the community (Correa et al.; Bertocchi et al.; 2022). The Ecuador study was in the community (Del Brutto et al., 2014).

Studies in a clinical, and non-clinical (undergoing treatment in health service or the community).

In Africa, a Nigerian study was conducted with non-clinical in the community (Igbokwe et al., 2020).

Concerning Asia, four studies were also with non-clinical living in the community, three in China (Xiao et al.,2021; Zhang et al.; Li & Kong; 2022), one in India (Pathak & Manapurath, 2021), and one from Iran (Sharifirad et al., 2013).

Five studies were led with clinical, three of them from Iranian nursing homes (Piadehkouhsarorcid et al., 2019; Kushkestan et al., 2021; Gholamzadeh et al., 2019), one with hospitalized diabetes patients in Iran (Alavi et al., 2017), and another in a Malaysian hospital (Mat et al., 2017).

In Europe, a non-clinical study was in a Turkey nursing home (Arpacıoğlu et al., 2021). Other three non-clinical were in the community, two in Spain (Bobes-Bascarán et al.; Picaza et al.; 2020), and one in Germany (Gloster et al., 2008). A clinical study was led in a Poland clinic (Chojak, 2022).

In Australia, all studies were with clinical elderly in health care services (Troeung & Egan, 2014; Wood et al., 2016).

In South America, most of the studies were non-clinical, such as two Brazilian (Correa et al.; Bertocchi et al.; 2022), and one Equatorian (Del Brutto et al., 2014). With clinical, one study was performed in a Brazilian health service (Martins et al., 2022).

The DASS-21 applicability in diverse contexts across countries

Regarding the use of the DASS-21 in the elderly living in diverse contexts, in Africa, this toll was used among Nigerian retirees (Igbokwe et al., 2020).

In Asia, DASS-21 was applied to Chinese immigrants (Li & Kong, 2022). In India et al. (2021) compared two psychometric scales (DASS-21 and GDS) in a slum area. It also used to in elderly with sleep disorders, in an Iranian nursing home (Kushkestan et al., 2021) and in a Chinese community (Zhang et al., 2022).

In Europe, DASS-21 was used to examine the psychometric properties in a German Primary Care Service (Gloster et al., 2008). To assess the effectiveness of psychological skills in the Poland healthcare service (Chojak et al., 2022). This tool was also used in the COVID-19 context, in the Spanish community (Bobes-Bascarán et al.; Picaza et al., 2020) and both nursing homes and communities in Turkey (Arpacıoğlu et al., 2021).

In Australia, the DASS-21 was used in health care services with elderly presenting persistent pain (Wood et al., 2016), and with Parkinson's disease (Troeung & Egan, 2014).

In South America, DASS-21 was used to analyze cognitive functions, whereby one study investigated Brazilian community-dwelling (Correa et al., 2022), and another was in an Equatorian rural area (Del Brutto et al., 2014).

DASS-21 was used to evaluate the use of mobile technology in the Brazilian community (Bertocchi et al., 2022), and to examine the influence of positive behaviors, attitudes, and values in a Brazilian healthcare service (Martins et al., 2022).

The DASS-21 purpose across countries

Concerning the purpose of the instrument, DASS-21 was used to assess the association between depressive and anxious symptoms among Nigerians in Africa (Igbokwe et al., 2020).

In Asia, the instrument evaluated the association between stress, anxiety, depression, and quality of life in a Chinese sample (Li& Kong, 2022). Another study assessed stress, anxiety, and depression in elderly with insomnia (Zhang et al., 2022), and chronic diseases (Xiao et al., 2021).

In Iran, these three variables were also verified in the elderly with insomnia (Kushkestani et al., 2021) and hospitalized patients (Alavi et al., 2017). Other Iranian studies assessed the effect of an intervention to reduce stress, anxiety and depression in community and nursing homes (Gholamzadeh et al., 2019; Piadehkouhsarorcid et al., 2019; Sharifirad et al., 2013). A study carried out in Malaysia also evaluated the same intervention in hospitalized patients.31 In India, these variables were evaluated in residents from a slum area (Pathak & Manapurath, 2021).

In Europe, DASS-21 assessed the effect of an intervention to reduce stress, anxiety and depression in a sample of Poland's elderly Kushkestani et al., 2021). Spain and Turkey used the DASS-21 to assess the presence of depression, anxiety and stress during the COVID-19 pandemic (Bobes-Bascarán et al.; Picaza et al., 2020). In Germany, DASS-21 was used to examine the psychometric properties (Gloster et al., 2008).

In Australia, the instrument assed the intensity of depression in the elderly with severe pain (Wood et al., 2016) and to evaluate the effect of an intervention to reduce stress, anxiety, and depression (Troeung & Egan, 2014), both in a health care service.

In South America, DASS-21 was used to verify the presence of stress, anxiety and depression in Brazilian clinical (Martins et al., 2022), and non-clinical (Correa et al., 2022). It was also used to evaluate the association between these three variables and quality of life.38 In Ecuador, was used in the elderly with cognitive decline (Del Brutto et al., 2014).

DASS-21 translation across countries

The original DASS-21 version was developed in the English language (Lovibond & Lovibond, 1995) and the results showed that the internal consistency for a normative sample of 717 individuals was: depression subscale of α=0.81, anxiety subscale of α=0.73, and stress subscale of α=0.81. The analysis of the basic components showed that the first three factors explain a high degree of variance.

Regarding the use of the DASS-21 translated into other languages, an African study applied the DASS-21 in a Nigerian translation, but there was no information about this process and the internal consistency (Igbokwe et al., 2020).

In Asia, Xiao et al. (2021) reported that the DASS-21 translated to Chinese has been widely used, with a reliability of 0.90 and validity of 0.90, and a Cronbach's α for the overall DASS-21 of 0.950. Pathak and Manapurat (2021) used the instrument in their research with a 0.88 of reliability and 0.92 of validity in India.

In Europe, Arpacıoğlu et al. (2021) showed that the validity and reliability of studies using DASS-21 translated to Turkish (Saricam, 2018) with the calculation table could be used to rate the severity of each subscale, but they did not report the results for internal consistency.

Gholamzadeh et al. (2019) and Piadehko et al. (2019) used the DASS-21 translated by Asghari et al.(2008) to Persian and the validity of the Persian version was confirmed with convergent and divergent analyses. The internal consistency (Cronbach alpha=0.92) and test-retest reliability (ICC=0.77) suggested satisfactory reliability. On the other hand, Kushkestani et al. (2021) just mentioned its use in their study.

In Australia, studies used the DASS-21 in the original English version (Troeung & Egan, 2014; Wood et al., 2016). In South America, researchers from Brazil did not report anything about Brazilian Portuguese DASS-21 translation and only mentioned its use in their study (Martins et al.; Correa et al.; Bertocchi et al., 2022).

Del Brutto et al. (2014) reported that the DASS-21 was independently translated from its original version to Spanish. This Spanish version was culturally adapted and tested in a random sample before the study, but they did not report the results from the internal consistency. Bobes-Bascará et al. (2020) only mentioned its use in their study.

4. Discussion

The purpose of this systematic review was to investigate the applicability of the DASS-21 with elderly across countries. The literature search focused on the aims of the studies, the purpose of the instrument, and the location of the participants.

The main finding was that the DASS-21 is applicable in both clinical and non-clinical elderly in different contexts. Almost half of the studies included clinical elderly (45%), with five studies from Asia (Gholamzadeh et al.; Piadehkouhsarorcid et al., 2019; Alavi et al.; Mat et al., 2017; Kushkestani et al., 2021), one from Europe (Chojak, 2022), two from Australia (Troeung & Egan, 2014; Wood et al., 2016), and one from South America (Martins et al., 2022). In this context, DASS-21 was used to evaluate individuals with psychological symptoms, sleep disorders, Parkinson's disease, diabetes, mild cognitive decline, and osteoarthritis. These results may be due to the increase in chronic degenerative diseases, particularly neurocognitive disorders with aging, which reflects a high prevalence in clinical individuals (Parova et al., 2019).

A total of 55% of the studies included non-clinical elderly, one from Africa(Igbokwe et al., 2020); four from China (Sharifirad et al., 2013; Xiao et al., 2021 Zhang et al.; Li & Kong, 2022);one from India (Pathak & Manapurath, 2012); four from Europe (Gloster et al., 2008; Bobes-Bascarán et al.; Picaza et al., 2020; Arpacıoğlu et al., 2021), and three from South America (Correa et al.; Bertocchi et al., 2022; Del Brutto et al., 2014). They evaluated psychological symptoms, psychometric scales comparison, and educational interventions. Although most of these participants were healthy, we suggest that there will be an increased number of people with mental health problems after the pandemic.

The mental health in elderly was extensively studied during the pandemic (Donavan & Blazer, 2020; Flett & Heisel, 2021). Findings reaffirm the urgent need to provide supportive care for this population, as the pandemic has resulted in high rates of anxiety, stress, and depression among them (Webb & Chen, 2022). It is necessary to focus on those who already have cognitive impairment, which may be a risk factor for triggering mental disorders with a direct impact on quality of life (Ransing et al., 2020).

Concerning reliability and validity, a Chinese study (Xiao et al., 2021) showed a reliability of 0.90 and a validity as well of 0.90. Piadehkoet et al. (2019) also showed reliability and validity (0.85 and 0.92 respectively) with proper statistics values in Iran. Pathak and Manapurat (2021) used the instrument with 0.88 of reliability and 0.92 of validity in India.

The use of the DASS-21 in different countries shows that the instrument is reliable for assessing depression, anxiety, and stress in elderly. These factors are highly prevalent mental health impairments in this population. The DASS-21 is suitable for preventive and diagnostic purposes and is a relevant instrument in mental health care (Levibond &Levibond, 1995; Gloster et al., 2008; Ebrahem et al., 2023).

5. Conclusion

The DASS-21 has been used in more than 13 different countries, and provides an important instrument to assess depression, anxiety, and stress in a single instrument. The highlights are studies from different countries where the DASS-21

was used to investigate phenomena related to depression, anxiety, and stress in non-clinical and clinical elderly. This instrument may help reduce participant burden related to answering different scales and promote assessment in settings with limited resources. The results reflect a summary of the papers available in the databases and are limited to the content produced until 2022. We suggest that the DASS-21 is a valuable tool for studying these topics and with this population across countries.

Also**,** DASS-21 can be used as an instrument to assess stress, anxiety, and depression, in both clinical and non-clinical elderly in the health professional practice. Therefore, it is recommended that health professional expand the use of this instrument in their practice to help assess the presence and severity of these symptoms during the care of elderly.

By doing so, health professional can monitor stress, anxiety, and depression which can support the ongoing development of strategies for this population. It is expected that will use appropriate assessment tools in their practice, including those related to mental health concerns, to expand the evidence base for improving the quality of care and interventions with elderly.

Future studies are recommended, including those with larger samples, consistent randomized clinical trials, and follow-up over different periods, to provide evidence of the effects of DASS-21 on mental health care for the elderly.

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