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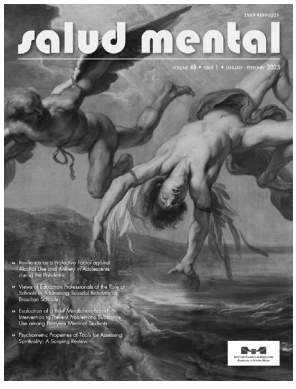
CONTENT



On the cover
La caída de Ícaro (1636-1638)
Oil on canvas, 195 × 180 mm
Jacob Peeter Gowy (1615-1661)
Museo Nacional del Prado

Instituto Nacional de Psiquiatría
Ramón de la Fuente Muñiz

Directorio

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Since 1977, the SALUD MENTAL as the official publication of the National Institute of Psychiatry Ramón de la Fuente National Muñiz has sought to respond to the publishing needs of researchers working in the area of mental health, basing on four fundamental criteria: continuous education, updating, information and a multidisciplinary approach.

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EDITORIAL
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Legislation: Plant *vs.* Drug

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Enacting laws that impact everyone's health is an obligation of the modern state. It is a highly nuanced, idealistic mandate, involving a legislative and technical path riddled with pitfalls and therefore fraught with danger. This is precisely what has happened with the legislative process to ensure legal certainty regarding the use, production, transportation, and marketing of the two forms of marijuana and its alkaloids: "medicinal" and "recreational."

This is where the problem and what I have called the socio-legislative struggles begin. Complaints were raised about the announcement by the government, when it submitted a bill amending the General Health Act and the Federal Penal Code (Opinion of the United Commissions of Justice and Health of the Minutes with a Draft Decree issuing the Federal Act for the Regulation of Cannabis and amending and adding various provisions of the General Health Act and the Federal Penal Code, 2021) to legalize marijuana for medicinal and therapeutic uses, in addition to enabling scientific research on the latter.

We should begin by clarifying the terms mentioned above. In any discussion of the medicinal use of marijuana, it is essential to know that there is no such thing as medicinal use of *cannabis sativa*. It is a plant with 60 to 80 active compounds and enormous diversity within the same plant. Genetic engineering is currently being undertaken and the relative or percentage components of its active substances are being modified. The active component of marijuana that has been studied for many years is called Delta-9-Tetrahydrocannabinol (Δ9-THC). It is synthesized and can be administered pharmacologically, for scientific experiments or for use in humans, by which time it is no longer marijuana. The genetic engineering to which the plant has been subjected has strengthened at least two groups of its active components: cannabinols and cannabinoids, and their percentages and potencies vary depending on the genetic interventions undertaken in the plant. It is no longer a plant with the same characteristics it has in the wild. Some of these components have properties that can damage the nervous system that have not yet been physiologically or pharmacologically studied, particularly in individuals with underlying mental pathology (Vaucher et al., 2017). The problem is exacerbated when these percentages of active ingredients are modified. The seller or owner of the plant is unaware of the exact composition of the plant. Quantitative studies would have to be conducted to reveal which and how many of these active ingredients are present, a complicated process in which neither its sellers nor suppliers engage.

In this respect, the possible medicinal use of marijuana in Mexico is an inconsistency and unfeasible, since there is no way to dose it or of knowing how much of the active ingredient one is administering, unlike a tablet of acetylsalicylic acid (aspirin), for example, whose weight is known, meaning that it can be dosed.

Free Will, Legislation, and Everyone's Health

Jostling for power, misinformation and interests all come into play, with people trying to combine their freedom with medicinal use. To date there is evidence that Δ9-THC, rather than marijuana itself, influences certain pathologies. These include reducing glaucoma, a condition of increased pressure within the eyeball, and the nausea caused by anticancer chemotherapy; increasing the appetite in certain chronic conditions; and alleviating various types of pain. All this knowledge is the result of published scientific research, available to

the public (Hurd et al., 2019). Since there is no overlap between recreational and medical use, the main issue is what it will be legislated for: recreational or medicinal use?

The Context of Addictions

One of the priority public health areas in the Mexican national development plan is mental health, particularly the area associated with drug addiction.

The problem of addiction is a global rather than a purely Mexican phenomenon, caused by educational, cultural, economic, and political factors transcending the health policies of each country to form part of globalization.

In this respect addiction treatment requires a complex approach. In other words, the addicted patient has many facets; it is not a question of simply reducing or controlling drug use. Addiction involves processes related to a person`s family history and situation, their personal structure and financial environment and is also linked to their genetic makeup. The question is why does one of two people exposed to the same drug, under similar circumstances, become addicted while the other does not? This is part of the complexity of the pathology and has to do with the fact that everyone is different. The fundamental differences may lie in our genetics, extending to all other areas (Smith et al., 2020). Research in the field of neuroscience has created ways to influence and assist addiction treatment effectively and rationally.

Another key aspect to consider in addictions is their comorbidity with mental health-related conditions such as depression, anxiety, bipolar disorder, and schizoaffective disorders, further complicating the comprehensive treatment and control of these diseases.

This is where the vision of transversal intervention begins, related to the social part: the decline in productivity, cognitive and affective disintegration, as well as the financial consequences for those affected and their families, not to mention the negative impact of the violent criminal behavior associated with drug trafficking on society, which criminalizes users and addicts, making it more difficult for them to seek medical help and for addiction to be regarded as an illness because of the stigma attached to it.

It is important to note that the Institute has a decisive impact on the training of highly specialized professionals with master's degrees, doctorates, postdoctoral degrees, and psychiatric and nursing specializations in the field of addictions. These personnel are essential for dealing with mental health problems in the health system at the national level. In addition to conducting research on addictions, the Ramón de la Fuente Muñiz National Institute of Psychiatry also trains the human resources required to do so.

The combined efforts of the government, with its material resources, the institutions providing research funds, the industry linked to legal drugs, tobacco and alcohol, and society, are therefore required to continue with this essential task for Mexican society.

Governments and societies must be both sensitive and attentive to providing the conditions and elements to create positive, constructive rewards for individuals, which is intricately linked to our physiology and survival.

Well-being is the only real antidote to addictions, and it is also essential to legislate to achieve this.

REFERENCES

Dictamen de las Comisiones Unidas de Justicia y de Salud de la Minuta con Proyecto de Decreto por el que se expide la Ley Federal para la Regulación del Cannabis y reforma y adiciona diversas disposiciones de la Ley General de Salud y del Código Penal Federal. *Gaceta Parlamentaria, no. 5736-II*, Cámara de Diputados, LXIV Legislatura. 10 de marzo de 2021, (México). https://gaceta.diputados.gob.mx/PDF/64/2021/mar/20210310-II.pdf

Hurd, Y. L., Manzoni, O. J., Pletnikov, M. V., Lee, F. S., Bhattacharyya, S., & Melis, M. (2019). Cannabis and the Developing Brain: Insights into Its Long-Lasting Effects. *The Journal of Neuroscience, 39*(42), 8250-8258. https://doi.org/10.1523/jneurosci.1165-19.2019

Smith, A., Kaufman, F., Sandy, M. S., & Cardenas, A. (2020). Cannabis Exposure During Critical Windows of Development: Epigenetic and Molecular Pathways Implicated in Neuropsychiatric Disease. *Current Environmental Health Reports, 7*(3), 325-342. https://doi.org/10.1007/s40572-020-00275-4

Vaucher, J., Keating, B. J., Lasserre, A. M., Gan, W., Lyall, D. M., Ward, J., Smith, D. J., Pell, J. P., Sattar, N., Paré, G., & Holmes, M. V. (2017). Cannabis use and risk of schizophrenia: a Mendelian randomization study. *Molecular Psychiatry, 23*(5), 1287-1292. https://doi.org/10.1038/mp.2016.252

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ORIGINAL ARTICLE
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Resilience as a Protective Factor against Alcohol Use and Anxiety in Adolescents during the Pandemic

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ABSTRACT

Introduction. The COVID-19 pandemic saw an increase in substance use and anxiety among adolescents. Although resilience can have a protective effect against both, there is a dearth of studies examining these relationships in Mexico. **Objective.** To determine the association between resilience and the frequency of alcohol use, as well as anxiety symptomatology, among high school students in southern Veracruz during the COVID-19 pandemic. **Method.** A cross-sectional, analytical study was administered at nine high schools in southern Veracruz. Online questionnaires were used to assess students' resilience, alcohol consumption patterns, and frequency of anxiety symptoms. These assessments were conducted using three instruments: RESI-M for resilience, ASSIST for alcohol consumption, and DASS-21 for anxiety symptomatology. Descriptive and associative statistics were used. **Results.** A total of 2,194 adolescents were included, of whom 78.6% had a low or medium level of resilience; 28.3% reported lifetime alcohol use, and 22.0% had used alcohol in the past three months. A total of 25.8% of the adolescents had symptoms of severe or extremely severe anxiety. Adolescents with lower levels of resilience, as well as its dimensions showed a higher frequency of alcohol consumption ($\chi 2$ = 24.7; p < .001) and anxiety levels ($\chi 2$ = 185.45; p < .001). **Discussion and Conclusion.** These findings suggest an association between resilience, alcohol consumption, and anxiety. Further studies are required to determine whether an intervention focused on promoting resilience reduces alcohol consumption and anxiety levels.

Keywords: Mental health, alcohol use, high school students, COVID-19 pandemic.

RESUMEN

Introducción. Durante la pandemia de COVID-19, se registró un aumento en el consumo de sustancias y la ansiedad entre los adolescentes. La resiliencia podría tener un efecto protector contra ambos, sin embargo, México carece de estudios que aborden estas relaciones. **Objetivo.** Determinar la relación de la resiliencia sobre la prevalencia del consumo de alcohol y la ansiedad, en estudiantes de bachillerato durante la pandemia de COVID-19. **Método.** Se diseñó un estudio transversal, analítico en nueve bachilleratos del sur de Veracruz. Mediante el uso de cuestionarios en línea, se evaluaron los niveles de resiliencia, así como las frecuencias del consumo de alcohol, y los síntomas de ansiedad utilizando los instrumentos RESI-M, ASSIST, y DASS-21, respectivamente. **Resultados.** Se incluyó a 2194 adolescentes, de los cuales el 78.6% mostró grado bajo o medio de resiliencia, el 28.3% han consumido alcohol alguna vez en su vida, y 22.0% lo consumieron los últimos tres meses. El 25.8% de los adolescentes presentó sintomatología de ansiedad severa o extremadamente severa. Los adolescentes con menores niveles de resiliencia, así como en sus dimensiones mostraron mayor frecuencia del consumo de alcohol ($\chi 2$ = 24.7; p < .001) y mayores niveles de ansiedad ($\chi 2$ = 185.45; p < .001). **Discusión y conclusión.** Estos hallazgos sugieren un vínculo entre la resiliencia, el consumo de alcohol, y la ansiedad. Se requiere de estudios para validar si la intervención enfocada en la promoción de la resiliencia reduce los niveles de consumo de alcohol y los niveles de ansiedad.

Palabras clave: Salud mental, alcohol, estudiantes de bachillerato, pandemia de COVID-19.

INTRODUCTION

During the COVID-19 pandemic, over two years of limited physical and social interaction contributed to the emergence of mental health problems (Leeb et al., 2020; Morales Chainé et al., 2021; Thompson et al., 2021). Globally, the prevalence of anxiety and depression increased by 25.2% and 20.5% respectively, among individuals aged 10-17 in comparison with 2020 (Capasso et al., 2021; Racine et al., 2021).

During lockdown, increased stress and more intense personal and family dynamics were associated with increased alcohol use (Capasso et al., 2021; Mojica-Perez et al., 2022; Soriano-Sánchez & Jiménez-Vázquez, 2022; Thompson et al., 2021). Research conducted during lockdown in 33 countries in Latin America and the Caribbean observed an increase in the frequency of heavy episodic drinking, particularly among individuals with anxiety symptoms (Garcia-Cerde et al., 2021; Quadri et al., 2023). Likewise, higher levels of alcohol consumption were reported in Mexico compared with the years before the COVID-19 pandemic (Barrera-Núñez et al., 2022; Capasso et al., 2021; Fernández Hernández et al., 2021; Ibarrola-Peña et al., 2023; Morales Chainé et al., 2021).

Various factors in an individual's internal and social environment influence the use of alcohol and other substances. Resilience, crucial for rapid adaptation and recovery from stressful or traumatic events, enhances an individual's physical and mental well-being. It involves maintaining a positive attitude, effectively regulating emotions, seeking support when needed, and learning from challenging experiences (Verdolini et al., 2021). Individuals with lower resilience have been reported to be more vulnerable to developing psychopathology and substance use (Sandra &, 2021; Tudehope et al., 2022; Verdolini et al., 2021; Zhang et al., 2020).

Despite evidence of increased alcohol consumption and anxiety symptomatology during the pandemic, in Mexico, there has been limited research addressing issues related to resilience skills in adolescents. This study therefore sought to determine the association between resilience and frequency of alcohol use, as well as anxiety symptomatology, among high school students in southern Veracruz during the COVID-19 pandemic.

METHODS

Study Design

A cross-sectional, analytical, observational study was administered to adolescents at nine public high schools in the municipalities of Acayucan, Chinameca, Cosoleacaque, Jaltipan, Juan Rodríguez Clara, Minatitlán, Sayula de Alemán, Soteapan and Zaragoza in southern Veracruz, Mexico, during the period from May to June 2021. These schools were selected based on the cooperation achieved with the authorities and the support provided for the implementation of the research.

Participants

A non-probabilistic sample of 4,580 students from the selected high schools, including both boys and girls ages 14 to 18, enrolled in the February-June 2021 semester, who voluntarily agreed to participate in the study and completed the inventories in full, were invited to participate. However, students with a prior psychiatric or psychological diagnosis by a specialist or who had received mental health treatment, whether pharmacological or non-pharmacological, were excluded. Moreover, students who did not voluntarily agree to participate were not included in the study. The response rate was 51.50%.

Instruments

Socioeconomic Data

This consisted of multiple-choice questions (available in Appendix I) related to sociodemographic data such as age, sex, semester, family structure, whether they engaged in sports or physical activity, or had any regular hobbies, the educational attainment of the head of the household, and students' work history outside the home.

Mexican Resilience Scale (RESI-M)

This instrument consists of a Likert-type questionnaire with 43 items ranging from 1 to 4 points (from "strongly disagree" to "strongly agree"), grouped into five dimensions: 1: strength and self-confidence (comprising the clarity individuals have about their goals, the effort they put into achieving them, and the confidence, optimism, strength and tenacity with which they cope with challenges); 2: social competence (the ease with which individuals relate to others); 3: family support (the loyal, supportive relationships existing within a family); 4: social support (the affective bonds between individuals in social groups such as friends and teachers); and 5: structure (the ability to organize both activities and time). RESI-M scores range from 43 to 172 points, with higher scores indicating higher levels of resilience, and the following cut-off points: < 50% low, 51-75% medium, and >76% high. This criterion was used at both the general level and the level of each dimension. The scale has a Cronbach's α total consistency of .93, explaining 43.6% of variance, and has been used in adolescent populations (Palomar Lever & Gómez Valdez, 2010; Gómez-Azcarate et al., 2014; Blanco et al., 2018; Rodríguez et al., 2015).

The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)

The second version of ASSIST, developed by the World Health Organization (Group, 2002), seeks to identify both licit and illicit substance use, assess the level of risk associated with drug use, and determine the most appropriate intervention for the individual. For alcohol use, the questionnaire comprises seven questions eliciting information about past use, frequency of use in the past three months, desire to use substances, problems caused, and activities not undertaken due to use, concerns of those close to the user, and attempts to reduce or stop use. To determine the type of risk, the scores obtained from items 2 to 7 are added and classified as follows: low risk: 0-10; moderate risk: 11-26; and high risk: 27 or more. This instrument is both reliable and valid, making it suitable for research, diagnosis, and interventions targeting the adolescent population (Linage & Lucio, 2013; Casas Muñoz et al., 2022; Tiburcio Sainz et al., 2016).

The Depression, Anxiety and Stress Scale - 21 (DASS-21)

Anxiety symptomatology was assessed using the anxiety subscale (items 2, 4, 7, 9, 15, 19, and 20) of the DASS-21 developed by Lovibond & Lovibond (1995). To score this subscale, the scores of the corresponding items should be added: the higher the total score, the greater the degree of symptomatology. It was scored as follows: 0-4 mild anxiety, 5-7 moderate, 8-9 severe, ≥10 extremely severe symptomatology. The instrument used has been validated and administered to the Mexican adolescent population (Camacho et al., 2016; Daza et al., 2002; Maciel-Saldierna et al., 2022).

Procedure

Permission was sought from the directors of the selected schools to disseminate and request the participation of students to complete the questionnaires. Students who agreed to participate through a letter of consent or informed consent form completed the questionnaires using a Google Forms format. For data analysis, groupings were made by region based on geographic proximity, as follows: Cosoleacaque, Chinameca and Jaltipan (Region I), Acayucan, Sayula de Alemán, Juan Rodríguez Clara (Region II), Minatitlán (Region III), Soteapan, and Zaragoza (Region IV).

Statistical analysis

Qualitative variables were analyzed as frequencies and percentages, and the chi-square test was used to determine the association between the frequencies of each of the dependent variables (frequency of anxiety, alcohol consumption, sociodemographic characteristics) and the independent variable (resilience). All data were analyzed using SPSS 25 for macOS (IBM Corp., 2017). A 95% confidence level was considered for all statistical tests, and a value of $p \leq .05$ was considered statistically significant. The statistical power of the chi-square tests was calculated using GPower software version 3.1 (Faul et al., 2007), to determine the probability of finding significant statistical differences.

Ethical considerations

The project was evaluated and approved by the Bioethics in Research and Investigation Committee of the Medicine Faculty of the Universidad Veracruzana, Minatitlán Campus (FOLIO: F-001-CI-2022). The informed consent procedure was followed for the adult population and the informed assent procedure for the adolescent population, in keeping with the Declaration of Helsinki and the General Health Law of Mexico. These ethical considerations are detailed in the relevant section of the study.

RESULTS

A total of 2,359 adolescents were invited, of whom 167 refused to participate, yielding a sample of 2194, 58.9% of whom were female and 41.1% male. The mean age was 16.6 ± 1.1 years (range 14-20 years). In addition, 97.7% of the adolescents were single and 13.9% reported working as well as studying. In regard to the educational attainment of the heads of household, 52.9% had completed high school or less, while 63.9% of the participants reported living in nuclear families (Table 1).

Resilience

Thirty percent (n = 658) of the adolescents had low, 48.8% (n = 1070) had medium, and 21.2% (n = 466) had high levels of resilience. In terms of the dimensions, 35.5% (n = 778) and 23.2% (n = 509) of the participants showed high and low levels of strength and self-confidence, respectively. At the same time, 46.4% (n = 1018) showed low and 19.6% (n = 429) high levels of social competence. In regard to family support, 29.0% (n = 636) of the adolescents showed low and 36.2% (n = 795) high levels. Regarding social support, 17.7% (n = 389) of the participants had low and 40.5% (n = 890) high levels. Finally, in terms of structure, 34.1% (n = 748) of the adolescents had low and 22.4% (n = 493) high levels.

Significant associations were observed between gender ($\chi 2$ = 23.83; $p < .001$), region ($\chi 2$ = 43.56; $p < .001$), semester ($\chi 2$ = 11.98; p = .017), family structure ($\chi 2$ = 27. 82; $p < .001$), engaging in physical activity ($\chi 2$ = 30.43; $p < .001$), and having a hobby ($\chi 2$ = 22.51; $p < .001$) and levels of resilience (Table 1).

Table 1
Distribution of Sociodemographic Variables Based on Resilience Levels in Adolescents from Public High Schools in Southern Veracruz.

Sociodemographic Variables		*Resilience [n (%)]*			*Total*	*p-value*
		Low	*Medium*	*High*		
Sex	Female	426 (32.9)	633 (48.9)	234 (18.1)	1293	< .001
	Male	232 (25.7)	437 (48.5)	232 (25.7)	901	
Age	14-15 years	128 (31.9)	200 (49.8)	73 (18.2)	401	
	16-17 years	420 (30.2)	671 (48.3)	297 (21.3)	1388	.152
	> 18 years	110 (27.1)	199 (49.1)	96 (23.7)	405	
Region	I	297 (33.6)	424 (48.0)	162 (18.3)	883	
	II	155 (32.7)	217 (45.8)	101 (21.3)	473	< .001
	III	88 (33.4)	132 (50.1)	43 (16.3)	263	
	IV	118 (20.5)	297 (51.6)	160 (27.8)	575	
Semester	Second	225 (32.0)	350 (49.7)	128 (18.2)	703	
	Fourth	200 (32.3)	290 (46.8)	129 (20.8)	619	.017
	Sixth	233 (26.7)	430 (49.3)	209 (23.9)	872	
Occupation	Works and studies	98 (29.5)	130 (42.6)	77 (25.2)	305	.051
	Only studies	560 (29.6)	940 (49.7)	389 (20.5)	1889	
Family structure	Nuclear	371 (26.4)	698 (49.8)	332 (23.6)	1401	< .001
	Single parent	287 (36.1)	372 (46.9)	134 (16.8)	793	
Guardian/parent's educational attainment	High school or less	338 (29.1)	577 (47.9)	246 (21.1)	1161	
	High school	205 (32.8)	294 (47.0)	126 (20.1)	625	.414
	University degree	115 (28.1)	199 (48.7)	94 (23.0)	408	
Engages in physical activity	Yes	365 (26.7)	663 (48.6)	334 (24.5)	1362	< .001
	No	293 (35.2)	407 (48.9)	132 (15.8)	832	
Hobbies	Yes	508 (27.9)	903 (49.6)	406 (22.3)	1817	< .001
	No	150 (39.7)	167 (44.2)	60 (15.9)	377	

Alcohol consumption

It was found that 71.7% (n = 1574) of the adolescents had never consumed alcohol in their lives, while 28.2% (n = 620) had, and 22.0% (n = 483) had done so in the last three months. A higher frequency of alcohol consumption was found among adolescents over 18 ($\chi^2 = 14.2$; $p < .01$), in higher semesters ($\chi^2 = 9.1$; $p < .001$), those who worked and studied ($\chi^2 = 19.0$; $p < .001$), had single parents ($\chi 2 = 6.04$; $p = .014$), in Region III ($\chi 2 = 33.9$; $p < .001$), and whose guardians/parents held undergraduate degrees or higher ($\chi 2 = 20.4$; $p < .001$). Other sociodemographic variables, such as gender, engagement in physical activity, and hobbies, did not show significant differences (Table 2).

When identifying the level of risk for alcohol consumption through ASSIST, we found that 9.2% (n = 201) of the adolescents were at medium risk and .4% (n = 8) at high risk. We observed an association between the level of risk for alcohol consumption and adolescents who worked ($\chi 2 = 30.6$; $p < .001$). Conversely, sex, age, region, semester, guardians'/parents' educational attainment, family

Table 2
Distribution of Alcohol Consumption among Adolescents from Public High Schools in Southern Veracruz.

Sociodemographic variables		*Alcohol Consumption*		*p-value*
		Yes n (%)	*No n (%)*	
Sex	Female	377 (29.2)	916 (70.8)	.263
	Male	243 (27)	658 (73)	
Age	14-15 years	92 (22.9)	309 (77.1)	< .001
	16-17 years	387 (27.9)	1001 (72.1)	
	> 18 years	141 (34.8)	264 (65.2)	
Semester	Second	169 (24)	534 (76.0)	< .001
	Fourth	160 (25.8)	459 (74.2)	
	Sixth	291 (33.4)	581 (66.6)	
Region	I	274 (31)	609 (69%)	< .001
	II	144 (30.4)	329 (69.6)	
	III	92 (35)	171 (65)	
	IV	110 (19.1)	465 (80.9)	
Occupation	Works and studies	118 (38.7)	187 (61.3)	< .001
	Only studies	502 (26.6)	1387 (73.4)	
Family structure	Nuclear	371 (26.5)	1030 (73.5)	< .014
	Single parent	249 (31.4)	544 (68.6)	
Guardian/parent's educational attainment	High school or less	291 (25.1)	870 (74.9%)	< .001
	High school	179 (28.6)	446 (71.4)	
	University degree	150 (36.8)	258 (63.2)	
Engages in physical activity	Yes	389 (28.6)	973 (71.4)	.688
	No	231(27.8)	601 (72.2)	
Hobbies	Yes	510 (28.1)	1307 (71.9)	.663
	No	110 (29.2)	267 (70.8)	

Note: Values are represented as frequencies (prevalences); Chi-square test, *$p \leq 0.05$.

structure, engaging in sports or exercise showed no association with the level of risk ($p > .05$).

We observed that students who reported having consumed alcohol had lower resilience than those who did not ($\chi 2 = 24.7$; $p < .001$). Likewise, adolescents who scored lower on the dimensions of strength and self-confidence, family support, and structure had a higher frequency of alcohol use (Table 3). A high risk of alcohol use was associated with low family ($\chi 2 = 11.0$; $p = .026$) and social support ($\chi^2 = 9.8$; $p = .043$). The statistical power of the chi-squared tests was greater than .80.

Anxiety

It was found that 61.5% ($n = 1350$) of the adolescents had mild, 12.6% ($n = 277$) had moderate, 6.8% ($n = 149$) had severe, and 19.1% ($n = 418$) had extremely severe anxiety symptoms. There was a significant difference in the frequency of anxiety symptoms between women and men. Fifty-five per cent ($n = 711$) of women had mild anxiety, while 24.0% ($n = 310$) had extremely severe anxiety ($\chi^2 = 67.82$; $p < .001$). Conversely, 70.9% ($n = 639$) of males had a mild degree of anxiety and 12.0% ($n = 310$) had an extremely severe degree of anxiety.

Table 3
Distribution Levels of Resilience and its Components based on Anxiety Symptomatology and Alcohol Consumption in Adolescents from Public High Schools in Southern Veracruz.

	Anxiety Symptomatology [n (%)]					*Alcohol Consumption [n (%)]*		
Level	*Mild*	*Moderate*	*Severe*	*Extremely Severe*	*p-value*	*No*	*Yes*	*p-value*
				Resilience				
Low	274 (20.3)	115 (41.5)	62 (41.6)	207 (49.5)		430 (27.3)	228 (36.8)	
Medium	709 (52.5)	125 (45.1)	71 (47.7)	165 (39.5)	< .001	776 (49.3)	294 (47.4)	< .001
High	367 (27.2)	37 (13.4)	16 (10.7)	46 (11.0)		368 (23.4)	98 (15.8)	
				Strength and Self-confidence				
Low	202 (15.0)	91 (32.9)	44 (29.5)	172 (41.1)		331 (21.0)	178 (28.7)	
Medium	576 (42.7)	118 (42.6)	66 (44.3)	147 (35.2)	<.001	653 (41.4)	254 (41.0)	< .001
High	572 (42.4)	68 (24.5)	39 (26.2)	99 (23.7)		590 (18.4)	188 (30.3)	
				Social Competence				
Low	539 (39.9)	147 (53.1)	90 (60.4)	242 (57.9)		722 (45.8)	296 (47.7)	
Medium	500 (37.0)	85 (30.7)	43 (28.9)	119 (28.5)	< .001	545 (34.6)	202 (32.5)	.641
High	311 (23.0)	45 (16.2)	16 (10.7)	57 (13.6)		307 (19.4)	122 (19.6)	
				Family Support				
Low	285 (21.1)	101 (36.5)	55 (36.9)	195 (46.7)		396 (25.1)	240 (38.7)	
Medium	481 (35.6)	104 (37.5)	52 (34.9)	126 (30.1)	< .001	549 (34.8)	214 (34.5)	< .001
High	584 (43.3)	72 (26.0)	42 (28.2)	97 (23.2)		629 (39.9)	166 (26.7)	
				Social support				
Low	183 (13.6)	55 (19.9)	32 (21.5)	119 (28.5)		271 (17.2)	118 (19.0)	
Medium	567 (42.0)	123 (44.4)	60 (40.3)	165 (39.5)	< .001	648 (41.1)	267 (43.1)	.257
High	600 (44.4)	99 (35.7)	57 (38.3)	134 (32.1)		655 (41.6)	235 (37.9)	
				Structure				
Low	363 (26.9)	118 (42.6)	66 (44.3)	201 (48.1)		490 (31.1)	258 (41.6)	
Medium	*623 (46.1)*	*117 (42.2)*	*60 (40.3)*	*153 (36.6)*	< .001	*711 (45.1)*	*242 (39.0)*	<.001
High	*364 (27.0)*	*42 (15.2)*	*23 (15.4)*	*64 (15.3)*		*373 (23.6)*	*120 (19.3)*	

A significant association was observed between levels of resilience ($\chi 2$ = 185.45; p < .001) and its specific factors [strength and self-confidence ($\chi 2$ = 163.51; p < .001), social competence ($\chi 2$ = 65.84; p < .001), family support ($\chi 2$ = 34.56; p < .001), social support ($\chi 2$ = 57.67; p < .001), structure ($\chi 2$ = 93.72; p < .001)], and frequency of anxiety symptoms (Table 2). The statistical power of the chi-squared tests was greater than .80.

An association was also found between the degree of anxiety symptomatology and the frequency of alcohol consumption, since 38.0% (n = 159) of those with extremely severe anxiety had consumed alcohol ($\chi 2$ = 39.4; p < .001).

DISCUSSION AND CONCLUSION

This study sought to determine the association between resilience and alcohol consumption and anxiety symptomatology in high school adolescents during the COVID-19 pandemic, observing that adolescents with lower levels of resilience and most of its components displayed a higher frequency of alcohol consumption and higher anxiety symptomatology, making it possible to establish an association between them.

The sample in the present study included more than 15% of high school students in an area of southern Vera-

cruz, including urban and rural populations, where one in three adolescents presented low levels of resilience, mainly females, consistent with findings in other healthy populations (Hjemdal et al., 2011; Tusaie et al., 2007). Given that resilience is a psychobiological factor that influences an individual's response to adverse life events, its absence may play a crucial role in the difficulty of adapting and successfully coping with these events. This in turn may result in various problems affecting emotional well-being, academic and work performance, and interpersonal relationships, with significant consequences for mental health and addictions (Hjemdal et al., 2011; Mesman et al., 2021; Tudehope et al., 2022; Verdolini et al., 2021; Wattick et al., 2023; Zhang et al., 2020).

The majority of adolescents who consumed alcohol showed low levels of resilience, including the domains of strength, self-confidence, family support, and structure, suggesting the possibility of emotional deficits that could increase their vulnerability to both alcohol consumption and the development of anxiety symptoms, as observed in other populations (Kennedy et al., 2019; Thompson et al., 2021; Tudehope et al., 2022; Zhang et al., 2020). Becoña (2007) notes that when faced with stressful life situations, individuals rely on three key factors: the first includes temperament and personal characteristics, while the second consists of the subject's reflective capacity and cognitive abilities. We believe that people with greater reflective capacity can evaluate their decisions more effectively and have a better sense of direction in life. In addition, family and social support were found to be associated with the prevalence of alcohol use in this study.

Despite the restrictions imposed during the pandemic, the observed lifetime frequency of drinking was significant, yet low compared to other studies on Mexican adolescents ages 12 to 19 during the pandemic, with estimated prevalences of 66.8% (Noh Moo et al., 2023) and 39.8% in the 2016 National Survey on Drug, Tobacco and Alcohol Use (Resendiz-Ezcobar et al., 2018; Villatoro-Velázquez et al., 2017). Notwithstanding the restrictions imposed by the health authorities and the limited access to and availability of alcoholic beverages during this period, and the fact that adolescents generally consume alcohol outside the home, which may have delayed and limited the onset of first-time consumption of this substance, an increase in alcohol consumption was observed in comparison with other regions of Mexico. This finding is consistent with the reductions found in other reports (Barrera-Núñez et al., 2022; Dumas et al., 2020; Jeong, 2023).

In addition, alcohol consumption in the past three months was both lower than in other studies in Mexico (40.8% Barrera-Núñez et al., 2022; 30.3% Jiménez-Padilla et al., 2022; 24.5% Noh Moo et al., 2023) and equal to or higher than in others (20.6% Ramírez-Toscano et al., 2023; 9.3% González-Bautista et al., 2019). Higher prevalences have been reported in other Latin American countries, such as Guatemala, Chile, and Argentina. Likewise, a decrease in the prevalence of alcohol use among individuals ages 15-18 was observed during the pandemic (47% to 38.5%, Monzon et al., 2024; past month alcohol use fell from 45.5% to 33.4%, Libuy et al., 2024). Quantity, frequency, episodic heavy drinking and alcohol-related problems were significantly reduced by 89%, 42%, 71%, and 143% respectively (Conde et al., 2021).

Factors such as social distancing policies, restricted access to alcohol, limited social interaction with friends, increased family cohesion, and home-based education may have significantly contributed to the decrease in alcohol consumption and related problems (Libuy et al., 2024; Conde et al., 2021). At the same time, the interaction between depression and anxiety symptoms, drug availability, association with drug-using peers, lack of parental supervision, boredom, negative affect coping, and increased adult drinking in the household are risk factors associated with higher alcohol use among adolescents (Lundahl & Cannoy, 2021; Barrera-Núñez et al., 2022; Ibarrola-Peña et al., 2023; Morales Chainé et al., 2021; Jiménez-Padilla et al., 2022). These conflicting results underscore the importance of fully characterizing the impact of the pandemic on adolescent substance use patterns.

In addition, the sociodemographic characteristics of the adolescents, such as belonging to a single-parent family, having guardians/parents with a higher educational level, working, and being from Region III (Minatitlán), were associated with a higher frequency of alcohol use. Previous research has shown that living in a single-parent family may be a risk factor for adolescent substance use (Oshi et al., 2018). It has also shown that adolescents who work and have their own financial resources can purchase alcohol without relying on their parents, in addition to which the influence of coworkers could lead them to adopt these behaviors (González-Bautista et al., 2019). Likewise, higher income was found to be positively associated with higher alcohol consumption during the COVID-19 pandemic (Garcia-Cerde et al., 2021).

High school students in Region III, which includes Minatitlán, showed a higher frequency of alcohol consumption compared to other regions. This situation could be related to the indigenous practices and traditions existing in some of these regions, resulting in a lower incidence of alcohol consumption. Previous reports on Mexican adolescents suggest that living in indigenous communities may have a protective effect on alcohol consumption (González-Bautista et al., 2019; Ozer & Fernald, 2008). In addition, the increase in the prevalence of alcohol use among adolescents may be due to decreased perceived risk and increased permissiveness. There is a positive correlation between social acceptance of alcohol use and its frequency among these groups (Cortés et al., 2021; Telumbre-Terrero et al., 2020).

Conversely, over 25% of the adolescents studied had severe or extremely severe levels of anxiety symptomatology, which is consistent with several studies reflecting similar data indicating that during the COVID-19 pandemic, one in five adolescents experienced clinically high anxiety symptoms (Maciel-Saldierna et al., 2022; Racine et al., 2021). This was because adolescents were affected by multiple stressors, including overcrowding, loneliness, fear, and high rates of infection. This situation was compounded by the disruption of daily routines, including school attendance and extracurricular activities (Morales Chainé et al., 2021; Wattick et al., 2023).

As a result, depression and anxiety symptoms are likely to have increased in this population, which in turn has been associated with an increased risk of substance use (Garcia-Cerde et al., 2021; Ibarrola-Peña et al., 2023; Mojica-Perez et al., 2022; Morales Chainé et al., 2021; Thompson et al., 2021; Wattick et al., 2023; Libuy et al., 2024). This may explain the greater frequency of alcohol use among adolescents with high levels of anxiety in this sample.

The association between lower scores for resilience and higher scores for anxiety has already been reported in other studies (Hjemdal et al., 2011; Verdolini et al., 2021; Zhang et al., 2020). Resilience is critical to adolescent mental health and should receive more attention in research, prevention, and clinical care, with a contextualized approach to early intervention (Tudehope et al., 2022; Verdolini et al., 2021). To move forward, it is critical to conduct longitudinal research that validates resilience interventions from an early age, promotes healthy emotional development, and identifies risk and protective factors during adolescence. This will enable more effective approaches to mental health and addiction prevention.

Although this study presents significant findings, it is important to recognize its limitations when interpreting results. The cross-sectional design prevents the establishment of causal relationships between variables, making it unclear whether low resilience leads to increased alcohol use and anxiety symptoms, or vice versa. Longitudinal or quasi-experimental studies are therefore required to clarify these relationships. In addition, the study's reliance on self-reported measures of resilience, alcohol use, and anxiety may introduce response bias. Moreover, the inventories used have not yet been validated for Mexican adolescent populations, potentially affecting the accuracy and reliability of the results. Furthermore, although the sample includes adolescents from various socioeconomic backgrounds, the fact that they were only drawn from public schools may limit the generalizability of the findings. Replication of this study in diverse adolescent populations is therefore critical to corroborating findings. It is also essential to validate the instruments used in these populations to increase reliability.

In conclusion, the study suggests that low levels of resilience may have increased the risk of alcohol use and anxiety symptomatology among students during the pandemic. In addition, the study suggests that emotional resilience could play a role in reducing alcohol use and anxiety symptoms among high school students. Further intervention research is required to establish causality and determine whether strategies used to promote resilience reduce alcohol use and anxiety symptomatology.

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Conflict of interest

The authors declare they have no conflicts of interest.

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Authors' contributions

AAPL and JCSF performed the statistical analysis, wrote up the methodology, results, tables, and figures, and reviewed all the other sections.
AAPL, ESM, JCSF and FV conducted the literature review, assisted with writing the introductory and discussion sections, and reviewed the final draft.

REFERENCES

Barrera-Núñez, D. A., Rengifo-Reina, H. A., López-Olmedo, N., Barrientos-Gutiérrez, T., & Reynales-Shigematsu, L. M. (2022). Changes inalcohol and tobacco consumption patterns before and duringthe Covid-19 pandemic. Ensanut 2018 and 2020. *Salud Pública de México, 64*(2), 137-147. https://doi.org/10.21149/12846

Becoña, E. (2007). Resiliencia y consumo de drogas: Una revisión. *Adicciones, 19*(1), 89-101.

Blanco, J. R., Jurado, P. J., Aguirre, S. I., & Aguirre, J. F. (2018). Composición factorial de la Escala de Resiliencia Mexicana en Universitarios Mexicanos. *Formación Universitaria, 11*(6), 99-106. https://dx.doi.org/10.4067/S0718-50062018000600099

Camacho, Á., Cordero, E. D., & Perkins, T. (2016). Psychometric properties of the DASS-21 among Latina/o college students by the US-Mexico border. *Journal of Immigrant and Minority Health, 18*(5), 1017-1023. https://doi.org/10.1007/s10903-016-0415-1

Capasso, A., Jones, A. M., Ali, S. H., Foreman, J., Tozan, Y., & DiClemente, R. J. (2021). Increased alcohol use during the COVID-19 pandemic: The effect of mental health and age in a cross-sectional sample of social media users in the US. *Preventive Medicine, 145*, 106422. https://doi.org/10.1016/j.ypmed.2021.106422

Casas Muñoz, A., Velasco Rojano, A. E., & Loredo Abdalá, A. (2022). Adaptation and validation of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) in a semi-rural population of Mexican Adolescents. *Revista Internacional de Investigación en Adicciones, 8*(1), 30-39. Retrieved from https://riiad.org/index.php/riiad/article/view/riiad-2022-1-04

Conde, K., Gimenez, P. V., Salomón, T., Peltzer, R. I., Laspiur, S., & Cremonte, M. (2021). Before and During the Pandemic: Alcohol Consumption and Related Problems in Argentina. *Revista Interamericana de Psicología/Interamerican Journal of Psychology, 55*(1). https://doi.org/10.30849/ripijp.v55i1.1444

Cortés, M. L., Morales-Quintero, L. A., Rojas, J. L., Moral, M. V, Flores, M., & Rodríguez-Díaz, F. J. (2021). Alcohol consumption patterns and perceptionof risk in Mexican students. *Revista Iberoamericana de Psicología y Salud, 12*(1),

17-33. https://doi.org/10.23923/j.rips.2021.01.042

Daza, P., Novy, D. M., Stanley, M. A., & Averill, P. (2002). The depression anxiety stress scale-21: Spanish translation and validation with a Hispanic sample. *Journal of Psychopathology and Behavioral Assessment, 24*(3), 195-205. https://doi.org/10.1023/A:1016014818163

Dumas, T. M., Ellis, W., & Litt, D. M. (2020). What does adolescent substance use look like during the COVID-19 pandemic? Examining changes in frequency, social contexts, and pandemic-related predictors. *Journal of Adolescent Health, 67*(3), 354-361. https://doi.org/10.1016/j.jadohealth.2020.06.018

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175-191. https://doi.org/10.3758/BF03193146

Fernández Hernández, C. E., Salazar Mendoza, J., Conzatti Hernández, M. E., Castellanos Contreras, E., Onofre Santiago, M. L., Luna Hernández, O. D., Rodríguez Muñoz, I., & Méndez Cordero, E. (2021). COVID-19 quarantine, a factor associated with legal drug usein nursing students. *European Scientific Journal, 17*(10). https://doi.org/https://doi.org/10.19044/esj.2021.v17n10p1

Garcia-Cerde, R., Valente, J. Y., Sohi, I., Falade, R., Sanchez, Z. M., & Monteiro, M. G. (2021). Alcohol use during the COVID-19 pandemic in Latin America and the Caribbean. *Revista Panamericana de Salud Pública, 45*, e52. https://doi.org/10.26633/RPSP.2021.52

González-Bautista, E., Zavala-Arciniega, L., Rivera-Rivera, L., Leyva-López, A., Natera-Rey, G., & Reynales-Shigematsu, L. M. (2019). Social factors associated with tobacco and alcohol consumption in Mexican adolescents from populations under100 000 inhabitants. *Salud Pública de México, 61*(6), 764-774. https://doi.org/10.21149/10563

Group, W. A. W. (2002). The alcohol, smoking and substance involvement screening test (ASSIST): Development, reliability and feasibility. *Addiction, 97*(9), 1183-1194. https://doi.org/10.1046/j.1360-0443.2002.00185.x

Gómez-Azcarate, E., Vera, A., Ávila, M., Musitu, G., Vega, E., & Dorantes, G. (2014). Resiliencia y felicidad de adolescentes frente a la marginación urbana en México. *Psicodebate, 14*(1), 45-68. http://dx.doi.org/10.18682/pd.v14i1.334

Hjemdal, O., Vogel, P. A., Solem, S., Hagen, K., & Stiles, T. C. (2011). The relationship between resilience and levels of anxiety, depression, and obsessive–compulsive symptoms in adolescents. *Clinical Psychology & Psychotherapy, 18*(4), 314-321. https://doi.org/10.1002/cpp.719

Ibarrola-Peña, J. C., Cueto-Valadez, T. A., Chejfec-Ciociano, J. M., Cifuentes-Andrade, L. R., Cueto-Valadez, A. E., Castillo-Cardiel, G., Cervantes-Cardona, G. A., Cervantes-Pérez, E., Cervantes-Guevara, G., Guzmán-Ruvalcaba, M. J., Sapién-Fernández, J. H., Guzmán-Barba, J. A., Esparza-Estrada, I., Flores-Becerril, P., Brancaccio-Pérez, I. V., Guzmán-Ramírez, B. G., Álvarez-Villaseñor, A. S., Barbosa-Camacho, F. J., Reyes-Elizalde, E. A., …González-Ojeda, A. (2023). Substance use and psychological distress in Mexican adults during COVID-19 pandemic: A cross-sectional study. I*nternational Journal of Environmental Research and Public Health, 20(*1), 716. https://doi.org/10.3390/ijerph20010716

IBM Corp. (2017). IBM SPSS Statistics for Macintosh (25.0). IBM Corp.

Jeong, W. (2023). Comparison of alcohol consumption and tobacco use among Korean adolescents before and during the COVID-19 pandemic. *PLoS ONE, 18*(3). https://doi.org/10.1371/journal.pone.0283462

Jiménez-Padilla, B. I., Flores-Garza, P. L., Alonso Castillo, M. M., & López-García, K. S. (2022). Parental alcohol consumptionand its relationshipwith adolescent alcohol consumption during the COVID-19 pandemic. *Revista Internacional de Investigación en Adicciones, 8*(2), 25-31. https://doi.org/10.28931/riiad.2022.2.04

Kennedy, B., Chen, R., Fang, F., Valdimarsdottir, U., Montgomery, S., Larsson, H., & Fall, K. (2019). Low stress resilience in late adolescence and risk of smoking, high alcohol consumption and drug use later in life. *Journal Epidemioly & Community Health, 73*(6), 496-501. https://doi.org/10.1136/jech-2018-211815

Leeb, R. T., Bitsko, R. H., Radhakrishnan, L., Martinez, P., Njai, R., & Holland, K. M. (2020). Mental health–related emergency department visits among children aged < 18 years during the COVID-19 pandemic—United States, January 1–October 17, 2020. *Morbidity and Mortality Weekly Report, 69*(45), 1675-1680. https://doi.org/10.15585/mmwr.mm6945a3

Libuy, N., Ibáñez, C., Araneda, A. M., Donoso, P., Contreras, L., Guajardo, V., & Mundt, A. P. (2024). Community-based prevention of substance use in adolescents: Outcomes before and during the COVID-19 pandemic in Santiago, Chile. *Prevention Science, 25*(2), 245-255. https://doi.org/10.1007/s11121-023-01539-9

Linage R. M., & Lucio Gómez-Maqueo, M. E. (2013). Propiedades psicométricas del ASSIST en un grupo de estudiantes mexicanos. *Revista Española de Drogodependencias, 38*(1), 37-51.

Lovibond, S. H., & Lovibond, P. F. (1995). *Depression Anxiety Stress Scales (DASS--21, DASS--42)* [Database record]. APA PsycTests. https://doi.org/10.1037/t01004-000

Lundahl, L. H., & Cannoy, C. (2021). COVID-19 and Substance Use in Adolescents. *Pediatric clinics of North America*, *68*(5), 977–990. https://doi.org/10.1016/j.pcl.2021.05.005

Maciel-Saldierna, M., Elizondo-Hernández, E., Cervantes-Guevara, G., Cervantes-Pérez, E., Cervantes-Cardona, G. A., Guzmán-Ramírez, B. G., Brancaccio-Pérez, I. V., Chejfec-Ciociano, J. M., Guzmán-Ruvalcaba, M. J., Cifuentes-Andrade, L. R., Cueto-Valadez, A. E., Cueto-Valadez, T. A., Ibarra-Camargo, S. A., Mellado-Tellez, M. P., Barbosa-Camacho, F. J., Fuentes-Orozco, C., & González-Ojeda, A. (2022). Prevalence of Depression, Anxiety, and Stress in Junior High School Students in Guadalajara, Mexico: A Cross-Sectional Survey Study. *International Journal of Environmental Research and Public Health, 19*(23), 15463. https://doi.org/10.3390/ijerph192315463

Mesman, E., Vreeker, A., & Hillegers, M. (2021). Resilience and mental health in children and adolescents: An update of the recent literature and future directions. *Current Opinion in Psychiatry, 34*(6), 586-592. https://doi.org/10.1097/YCO.0000000000000741

Mojica-Perez, Y., Livingston, M., Pennay, A., & Callinan, S. (2022). Examining the relationship between alcohol consumption, psychological distress and COVID-19 related circumstances: An Australian longitudinal study in the first year of the pandemic. *Addictive Behaviors, 135*, 107439. https://doi.org/10.1016/j.addbeh.2022.107439

Monzon, J., Barnoya, J., Mus, S., Davila, G., Vidaña-Pérez, D., & Thrasher, J. F. (2024). Changes in substance use among adolescents before and during the COVID-19 pandemic in Guatemala. *Frontiers in Psychiatry, 15*, 1331962. https://doi.org/10.3389/fpsyt.2024.1331962

Morales Chainé, S., López Montoya, A., Bosch Maldonado, A., Beristain Aguirre, A., Robles García, R., Garibay Rubio, C. R., Astudillo García, C. I., Lira Chávez, I. A., & Rangel Gómez, M. G. (2021). Mental health symptoms, binge drinking, and the experience of abuse during the COVID-19 lockdown in Mexico. *Frontiers in Public Health, 9*, 656036. https://doi.org/10.3389/fpubh.2021.656036

Noh Moo, P. M., Ahumada Cortéz, J. G., Villegas-Pantoja, M. A., Valdez Montero, C., Castillo Arcos, L. de C., & Lopez Cisneros, M. A. (2023). Consumo de drogas lícitas e ilícitas en adolescentes en tiempos de la COVID-19; Consumption of legal and legal drugs in adolescents intimes of COVID-19. *Horizonte Sanitario, 22*(1), 107-115. https://doi.org/10.19136/hs.a22n1.5017

Oshi, S. N., Abel, W. D., Agu, C. F., Omeje, J. C., Whitehorne Smith, P., Ukwaja, K. N., Roomes, T. R., Meka, I. A., Weaver, S., Rae, T., & Oshi, D. C. (2018). Single parent family structure as a predictor of alcohol use among secondary school students: Evidence from Jamaica. *Asian Pacific Journal of Cancer Prevention, 19*(Suppl. 1), 19-23. https://doi.org/10.22034/APJCP.2018.19.S1.19

Ozer, E. J., & Fernald, L. C. H. (2008). Alcohol and tobacco use among rural Mexican adolescents: Individual, familial, and community level factors. *Journal of Adolescent Health, 43*(5), 498-505. https://doi.org/10.1016/j.jadohealth.2008.04.014

Palomar Lever, J., & Gómez Valdez, N. E. (2010). Desarrollo de la Escala de Medición de la Resiliencia con Mexicanos (RESI-M); Construction of a measurement scale of resilience in mexicans (RESI-M). *Interdisciplinaria, 27*(1), 7-22. Retrieved from http://www.scielo.org.ar/scielo.php?pid=S1668-70272010000100002&script=sci_arttext&tlng=es

Quadri, M. F. A., Lusher, J., Folayan, M. O., Tantawi, M. El, Zuñiga, A. A., Brown, B., Aly, N. M., Okeibunor, J. C., Florencia, G., Jafer, M., Ara, E., Miranda, K. A., Al-Khanati, N. M., Ellakany, P., Gaffar, B., Ishabiyi, A. O., Khan, A. T., Khalid, Z., Lawal, F.B., …Nguyen, A. L. (2023). Factors associated with an increase in alcohol consumption and tobacco use during the COVID-19

pandemic: A cross-sectional study of data from 105 countries. *Tobacco Induced Diseases, 21*, 14. https://doi.org/10.18332/tid/157205

Racine, N., McArthur, B. A., Cooke, J. E., Eirich, R., Zhu, J., & Madigan, S. (2021). Global prevalence of depressive and anxiety symptoms in children and adolescents during COVID-19: A meta-analysis. *JAMA Pediatrics, 175*(11), 1142-1150. https://doi.org/10.1001/jamapediatrics.2021.2482

Ramírez-Toscano, Y., Canto-Osorio, F., Carnalla, M., Colchero, M. A., Reynales-Shigematsu, L. M., Barrientos-Gutiérrez, T., & López-Olmedo, N. (2023). Patrones de consumo de alcohol en adolescentes y adultos mexicanos: Ensanut Continua 2022. *Salud Pública de México, 65*, s75-s83. https://doi.org/10.21149/14817

Reséndiz Escobar, E., Bustos Gamiño, M. N., Mujica-Salazar, R., Soto Hernández, I. S., Cañas Martínez, V., Fleiz Bautista, C., Gutiérrez López, M. L., Amador Buenabad, N., Medina-Mora, M. E., & Villatoro Velázquez, J. A. (2018). National trends in alcohol consumption in Mexico: results of the National Survey on Drug, Alcohol and Tobacco Consumption 2016-2017. *Salud Mental, 41*(1), 7-15. https://doi.org/10.17711/SM.0185-3325.2018.003

Rodríguez, V. M. V., Alemán, G. G. S., Estrada, S. P. C., & Sifuentes, L. E. L. (2015). Niveles de resiliencia en una población de estudiantes de licenciatura y su asociación con variables familiares y académicas. *Revista Iberoamericana de Producción Académica y Gestión Educativa, 2*(3).

Sandra, L., & Muqtadir, J. (2021). *Resilience models for children and teenagers in learning during the pandemic.* Proceedings of the 2nd International Conference on Technology and Educational Science (ICTES 2020), pp. 189-194. https://doi.org/10.2991/assehr.k.210407.236

Soriano-Sánchez, J., & Jiménez-Vázquez, D. (2022). Predictors of adolescent drinking: A systematic review of cross-sectionalstudies. *Revista Estudios Psicológicos, 2*(4), 73-86. https://doi.org/10.35622/j.rep.2022.04.006

Telumbre-Terrero, J. Y., López-Cisneros, M. A., Ruiz-Gómez, G. M., Mendoza-Catalán, G. S., & Fuentes-Ocampo, L. (2020). Social permittivity, spirituality and intake of alcoholic drinks in adolescents. Ra Ximhai: Revista Científica de Sociedad, Cultura y Desarrollo Sostenible, 16(3), 133-148. https://doi.org/10.35197/rx.16.03.2020.07.jt

Thompson, K., Dutton, D. J., MacNabb, K., Liu, T., Blades, S., & Asbridge, M. (2021). Changes in alcohol consumption during the COVID-19 pandemic: Exploring gender differences and the role of emotional distress. Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice, 41(9), 254-263. https://doi.org/10.24095/hpcdp.41.9.02

Tiburcio Sainz, M., Rosete-Mohedano, M. G., Natera Rey, G., Martínez Vélez, N. A., Carreño García, S., & Pérez Cisneros, D. (2016). Validity and Reliability of the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) in University Students. *Adicciones, 28*(1), 19. https://doi.org/10.20882/adicciones.786

Tudehope, L., Lee, P., Wiseman, N., Dwirahmadi, F., & Sofija, E. (2022). The effect of resilience on the relationship between perceived stress and change in alcohol consumption during the COVID-19 pandemic in Queensland, Australia. *Journal of Health Psychology, 27*(12), 2696-2713. https://doi.org/10.1177/13591053211062351

Tusaie, K., Puskar, K., & Sereika, S. M. (2007). A predictive and moderating model of psychosocial resilience in adolescents. *Journal of Nursing Scholarship, 39*(1), 54-60. https://doi.org/10.1111/j.1547-5069.2007.00143.x

Verdolini, N., Amoretti, S., Montejo, L., García-Rizo, C., Hogg, B., Mezquida, G., Rabelo-da-Ponte, F. D., Vallespir, C., Radua, J., Martinez-Aran, A., Pacchiarotti, I., Rosa, A. R., Bernardo, M., Vieta, E., Torrent, C., & Solé, B. (2021). Resilience and mental health during the COVID-19 pandemic. *Journal of Affective Disorders, 283*, 156-164. https://doi.org/10.1016/j.jad.2021.01.055

Villatoro-Velázquez, J. A., Resendiz-Escobar, E., Mujica-Salazar, A., Bretón-Cirett, M., Cañas-Martínez, V., Soto-Hernández, I., Fregoso-Ito, D., Fleiz-Bautista, C., Medina-Mora, M. E., Gutiérrez-Reyes, J., Franco-Núñez, A., Romero-Martínez, M., & Mendoza-Alvarado, L. (2017). *Encuesta Nacional de Consumo de Drogas, Alcohol y Tabaco 2016-2017: Reporte de Alcohol.* Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Instituto Nacional de Salud Pública, Comisión Nacional Contra las Adicciones, Secretaría de Salud. (2017). Ciudad de México, México: INPRFM. Retrieved from https://encuestas.insp.mx/ena/encodat2017.php

Wattick, R. A., Hagedorn, R. L., & Olfert, M. D. (2023). Impact of resilience on college student mental health during COVID-19. *Journal of American College Health, 71*(7), 2184-2191. https://doi.org/10.1080/07448481.2021.1965145

Zhang, J., Yang, Z., Wang, X., Li, J., Dong, L., Wang, F., Li, Y., Wei, R., & Zhang, J. (2020). The relationship between resilience, anxiety and depression among patients with mild symptoms of COVID-19 in China: A cross-sectional study. *Journal of Clinical Nursing, 29*(21-22), 4020-4029. https://doi.org/10.1111/jocn.15425

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Views of Education Professionals of the Role of Schools in Addressing Suicidal Behavior at Brazilian Schools

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ABSTRACT

Introduction. The suicide rate among adolescents is a public health problem in Brazil, due to the significant increase observed in attempts and deaths. Despite the recent legislation on prevention, there is a lack of effective public policies, particularly in schools. Teachers, who have direct contact with adolescents, are often ill-equipped to deal with this issue. **Objective:** To understand how education professionals identify the role of schools in dealing with suicidal behavior. **Method:** A transversal, exploratory, qualitative study. Eight public school teachers working with adolescents participated in the research. Interviews were conducted via Google Meet due to the pandemic. Braun and Clarke's inductive thematic analysis was used to analyze the data. **Results:** The analysis of the interviews yielded108 codes, resulting in the topic "Schools also involve the issue of affection between teachers and students." **Discussion and conclusion:** The influence of the affection between teachers and students in preventing suicidal behavior was emphasized, together with the challenges schools face in addressing this issue. This study has shown that schools are key elements in protecting adolescents from suicidal behavior. However, it is essential to develop strategies that include incorporating mental health into the curriculum and teacher training.

Keywords: Suicide prevention, school, adolescent.

RESUMEN

Introducción. La tasa de suicidio entre adolescentes es un problema de salud pública en Brasil, con un aumento significativo de intentos y muertes. A pesar de la reciente legislación sobre prevención, faltan políticas públicas eficaces, especialmente en las escuelas. Los profesores, que tienen contacto directo con los adolescentes, muchas veces no están preparados para lidiar con este tema. **Objetivo:** Conocer cómo los profesionales de la educación identifican el papel de la escuela en el abordaje del comportamiento suicida. **Método:** Estudio cualitativo, transversal y exploratorio. Participaron en la investigación ocho profesores de escuelas públicas que trabajaban con adolescentes. Las entrevistas se realizaron a través de Google Meet debido a la pandemia. Se utilizó el análisis temático inductivo de Braun y Clarke para analizar los datos. **Resultados:** El análisis de las entrevistas generó 108 códigos, que resultaron en el Tema "La escuela también tiene la cuestión del afecto entre profesor y alumno". **Discusión y conclusión:** Se enfatizó la influencia de los afectos entre profesores y alumnos en la prevención de la conducta suicida y se mostraron los desafíos que enfrentan las escuelas para lidiar con este tema. Este estudio ha demostrado que las escuelas son elementos clave en la protección de los adolescentes contra el comportamiento suicida. Sin embargo, es necesario desarrollar estrategias que incluyan la integración de la salud mental en el plan de estudios y la formación de los profesores.

Palabras clave: Prevención del suicidio, escuela, adolescente.

INTRODUCTION

Suicide among adolescents is an urgent public health challenge in Brazil since there has been a significant increase in suicide attempts and deaths (Ministry of Health, 2021). This phenomenon not only impacts the lives of young people, but also their communities (WHO, 2023).

Suicidal behavior comprises a continuum encompassing all aspects related to the act of taking one's own life (Bertolote, 2012). It includes suicide, characterized by the act of taking one's own life; attempted suicide, a non-fatal, self-inflicted action, with the aim of achieving death; and suicidal ideation, involving thoughts and planning related to suicide (Klonsky et al., 2016).

Adolescence is a key stage in human development, since this is the period when an individual acquires the knowledge and skills to deal with social and emotional issues to actively contribute to social life (WHO, 2020). It is a period when suicidal thoughts are common in the situations of acute stress adolescents face, but they are usually fleeting and do not necessarily constitute psychopathology. However, if these thoughts are persistent and intense, the risk of suicidal behavior increases. Adolescents are more prone to impulsivity and immediacy, as their emotional health is rapidly developing, so the end of a relationship, a situation of humiliation or not belonging to a group can trigger suicidal behavior (Botega, 2015).

Low self-esteem, limited problem-solving ability, anxiety, a previous mental disorder, sexual abuse, physical violence, psychological violence, childhood abuse, loss of significant others, bullying, a history of suicide attempts, suicidal ideation, non-suicidal self-injury, lack of family or social support, feelings of hopelessness, helplessness, pessimism, impaired school performance, perfectionism, use of psychoactive substances and access to lethal means can all promote suicidal behavior (Santos et al., 2014; Dávila Cervantes & Luna Contreras, 2019). It has been estimated that 90% of suicide cases among young people are associated with depression (Hawton & Fortune, 2008; Hawton et al., 2012). For Bertolote et al., (2012) and Botega, (2015), risk factors related to mental disorders or individual and family history, as well as drafting a detailed suicide plan and previous suicide attempts increase suicide risk.

According to the World Health Organization, (2023), suicide mortality is a significant concern among young people ages 15 to 29. Every year, over 700,000 people commit suicide, with more than 20 suicide attempts for every act completed (WHO, 2023).

In the Americas, the suicide rate is 9.8 per 100,000 population, and is more prevalent among males (WHO, 2016). In Brazil, the rate is 6.6 per 100,000 population, and also more common among males. The past decade has seen an alarming 43% increase in the annual number of deaths by suicide in Brazil. This increase in cases was identified in every region in Brazil, with the South and Midwest having the highest suicide death rates. In terms of age group, there was an 81% increase in suicide death rates among adolescents. The North had the highest risk of death by suicide among young people ages 15 to 19, followed by the Midwest and the South (Ministry of Health, 2021). It is worth noting that the underreporting of cases of death by self-injury without intention to die may affect the data mentioned above (Avanci et al., 2021).

The worrying increase in suicide death rates in Brazil has led to a breakthrough in public policy. In 2019, the enactment of Law No. 13,819 established suicide prevention as a national policy, requiring the participation of all spheres of government. The legislation outlines several objectives for suicide prevention in the country, including the promotion of mental health, the control of factors that determine and condition mental health, as well as intersectoral coordination for suicide prevention, involving sectors such as education, health, social assistance and the press.

Despite the progress achieved in the legislative sector on the issue, where public policies are concerned, there is still a need to structure actions nationwide, particularly in the school environment, with a focus on mental health promotion and suicide prevention. In the Brazilian setting, the rise of suicidal behavior among teenage students contrasts with the incipient presence of public policies targeting schools to address this situation. There is a dearth of studies on the subject in the national context, showing that school staff often lack the knowledge to make referrals and conduct suicide prevention interventions. As a result, staff often feel ill-equipped to deal with situations involving suicidal behavior, reflecting the lack of research on this issue (Brito et al., 2020).

As teachers are in contact with adolescents on a daily basis in the school environment (Estanislau & Bressan, 2014), it is essential to explore how they have addressed suicidal behavior among adolescent students.

The aim of this study is therefore to understand how education professionals view the role of schools in addressing suicidal behavior.

METHOD

This is a transversal, exploratory, qualitative study using Vygotsky's historical-cultural theoretical framework. The approach, based on dialectical and historical materialism, seeks to examine the relationship between phenomena, to explore rather than just describe, and to analyze historically constructed phenomena (Vygotsky, 2009). The qualitative aspect to examine the topic in greater depth is also used in the study of the history of relationships, opinions and interpretations (Polit et al., 2004; Minayo, 2013).

This article is an excerpt from the thesis entitled "Suicidal Behavior of Schoolchildren from the Perspective of

Teachers and Nurses: a Study based on the Historical-Cultural Approach."

Procedure and participants

Participants in this research were selected using the snowball method (Vinuto, 2014) because of lockdown during the COVID-19 pandemic, in which face-to-face contacts for research were suspended (Ornell et al., 2020). The invitation to participate in the survey was sent through social media to reach the largest possible number of potential participants.

The period for inviting participants and conducting interviews was October 1, 2020 to May 13, 2021.

The inclusion criterion was having worked as a teacher for at least a year at elementary and high schools in the state of São Paulo. The exclusion criterion was having been retired for over two years.

The study was conducted in the state of São Paulo due to the rise in suicide rates in the 10-19 age group, with an increase in deaths being observed from 113 in 2010 to 187 in 2019 in a population of 5,691,113 inhabitants (São Paulo, 2019).

Data ProductionTechnique

The technique used to produce data was an online questionnaire with questions on the characterization of the participants followed by the scheduling of a semi-structured remote interview.

For the semi-structured interview, the authors used an interview guide drawn up by the authors, based on a literature review conducted earlier, such as how long they had been working with adolescents, the support offered by the school for adolescents with suicidal behavior, and the role of teachers and school management in helping students with suicidal behavior. This type of interview was chosen because it is an expanded form of interaction that emerges at the time of data collection. The interview is regarded as a process of social interaction, both verbal and non-verbal, which takes place between the researcher, who has a specific aim, and an interviewee, who possesses relevant information for understanding the phenomenon being studied. This process is mainly mediated through language. During the interaction between the participants and the lead researcher, key information emerged that had not been included in the questions asked and was regarded as a useful contribution to the data. Another situation was the issues inherent in the spontaneous interaction during the interview, which enhanced the material used to construct the data (Manzini, 2004). These interactions during the interview proved to be an efficient means of understanding the phenomenon as a whole (Castro & Oliveira, 2022).

Initial contact with the professionals was made by the first author, a doctoral student nurse, specializing in mental health and psychiatry and suicidal behavior, with experience in this type of research. When interest in participating in the study was identified by telephone, Whatsapp messages, email or other forms of contact, a link was sent by email or Whatsapp to a form available on Google Forms with an Informed Consent Form. If the person agreed to take part in the study, they were directed to a page with questions about their personal details.

The invitation to take part in the survey was sent to twenty-one professionals using the snowball method. Although fourteen respondents agreed to take part in the survey, six of them did not schedule an appointment for the interview, leaving a total number of eight respondents. It was a challenge for teachers to take part. Some of the reasons given for declining to participate included being overworked as a result of the shift to remote teaching during the pandemic and difficulty securing an appointment for the interview. In addition, the researchers believe that the fact that this is a delicate subject to be approached online with an unknown person may have contributed to the reluctance to take part.

Interviews were conducted remotely by the first author, due to the COVID-19 restrictions, using Google Meet. The researcher began by introducing herself to each participant and subsequently proceeded to interview them. The pilot study was the first interview, in which the semi-structured interview guide was found to be adequate. As there is no indication in the historical-cultural approach to exclude an interview from a pilot study and as the interview guide was considered adequate, the interview was included in the data set.

The interviews were transcribed literally and accurately, preserving the participant's speech and respecting the interviewees' pauses. The total duration of the interviews was six hours, 13 minutes and 28 seconds.

Data construction tool

The method used was inductive thematic analysis, developed by Braun & Clarke, (2006), to identify relevant themes in the data. This type of analysis is compatible with Vygotsky's, (2009) historical-cultural perspective, which provides an in-depth, theoretical understanding of the data collected, in line with the health promotion and mental health references used in this article.

Data were constructed by transcribing the interviews, yielding 149 single-spaced pages, formatted in Arial font, size 12. webQDA software was used to organize the codes generated inductively by the main researcher after a detailed reading of the interviews (Souza et al., 2016). The second researcher and the Health in Basic Education and Historical-Cultural Approach Research Group helped prepare the codes. To ensure the methodological rigor of this study, the Consolidated Criteria for Reporting Qualitative Research (COREQ) Checklist was used (Tong et al., 2007).

Characterization of Participants

Names of popular Brazilian singers were used as pseudonyms for the eight teachers who took part in the study. Below is a description of the participants at the time of the interview:

- Adriana, 33, holds a degree in Social Sciences, has worked as a teacher for three years and, at the time of the interview, had been a public-school coordinator for less than a year. She has been working with adolescents for eight years, has no specialization, has undergone psychotherapy, has not taken any courses or specializations related to suicide prevention, and has experienced situations related to the suicide of schoolchildren.
- Alceu, 39, holds a language degree, works at elementary and high schools, has worked with adolescents for nine years, and at public schools for ten, has been in therapy and has not experienced a situation with a student displaying suicidal behavior.
- Alcione, 47, holds a degree in physical education and pedagogy with a specialization in school management. She has worked as a teacher for 15 years at elementary and high schools and has had the same amount of experience with adolescents. She is currently deputy principal of a public school, has not been to therapy, has experienced situations of suicidal behavior among schoolchildren and has taken a suicide prevention course at a religious institution.
- Clara, 39, holds a graduate degree, works at elementary and high schools, and has worked with adolescents for five years, three in the public sector. She has already been to therapy, has no training in suicide prevention and has not experienced a situation involving suicidal behavior by adolescents at school.
- Elza, 32, is studying for a master's degree, works in secondary education and has been professionally employed for ten years. She has worked with adolescents for 12 years, in the public sector for three years, has been in therapy and has experienced suicidal behavior among school adolescents.
- João, 23, holds a degree in physics, works in elementary and high schools, has been working with teenagers for two years, works at two schools, has never undergone psychological treatment, has not taken any courses related to suicide prevention and has experienced students at school who were at risk of taking their own lives.
- Marisa, 54, holds a degree in literature, works in elementary and high schools, has been working with adolescents for two years, has undergone therapy, and has not experienced situations involving suicidal behavior in school.
- Nara, 59, who does not provide details about her education, has worked at schools for 29 years, has 20 years of experience working with adolescents in elementary and high schools, and has worked in the public sector for 15 years. She currently works at a school, has not undergone therapy, has no training in suicide prevention and has not experienced situations involving suicidal behavior in schoolchildren.

Ethical considerations

This study was submitted to the Research Ethics Committee and complied with the norms and guidelines governing research with human beings, in accordance with Resolution 466/12 of the Ministry of Health. The study was submitted to the Research Ethics Committee of the Ribeirão Preto School of Nursing at the University of São Paulo (USP).

The data production period began after the study was approved by the Research Ethics Committee. Participation of the research subjects was contingent on their signing the Informed Consent Form. It is understood that this research offered subjective risks for its participants, such as the possibility of feeling uncomfortable with the content of the questions; feeling uncomfortable about giving answers, which are related to the processes in their everyday work; and difficulty answering the questionnaire during working hours. It was thought that one of the benefits of taking part in the study was that participants would have a space to express themselves and reflect on the mental health demands that have arisen in schools, with a researcher who is a registered nurse specializing in mental health and psychiatry. In addition, the results of the study will serve to spark discussions on public policies and practices in education and health services, which, in turn, would positively influence the actions taken with teenage students.

RESULTS AND DISCUSSION

The transcription of the eight interviews yielded 108 codes on the role of schools in suicidal behavior, from which the topic "Schools also involve the issue of affection between teachers and students" was constructed. The ten most frequent codes are given below: "Schools lack health services," "Public schools have no interest in working with teachers on mental health," "Schools as a welcoming environment," "Schools as a social relations environment," "School management of care for adolescents in distress when this affects other students," "Training school staff to deal with students in distress," "Public schools are not interested in working with professionals on suicide prevention," "School and

health services are separate when it comes to caring for adolescents," "Schools work with specific actions regarding suicidal behavior," "Schools are reluctant to address the issue." The researchers preserved the words and expressions used by the participants when constructing the codes.

Elza says that schools are a place where affection is created between students and teachers, where there is genuine concern for these students on the part of teachers, who often provide support in students' lives:

> *And schools also involve affection between teachers and students, don't they? There is affection and this affection is shown in some way, you don't need to touch the student or anything to show affection and show you care. Many public-school students used to have support from their teachers, a teacher who was their teacher friend, and now they don't have that any more, do they?* (Elza, teacher, 12 years' experience)

In this extract, Elza describes the school environment as a space that goes beyond the realm of scientific knowledge, highlighting its importance in creating affection and bonds that can play a key role in protecting students from suicidal behavior.

Vygotsky (2009) emphasizes the importance of school for the individual, particularly during adolescence, because it is through mediated social relationships that adolescents construct their inner and outer worlds. At school, if social relationships are healthy and promote the achievement of life projects, it becomes a protective environment against suicidal behavior (Juliano & Yunes, 2014), with the education professional being the main subject in this process. But for effective care, there must be mediators in the school who encourage life. Studies by Brito et al., (2020), Santos et al., (2014) and Estanislau & Bressan, (2014) have shown the importance of training teachers so that schools can provide a healthy environment for students.

Elza also said that the support the school provided for students was related to the profile of the school management:

> *I don't know if I was very unlucky, in fact, there was a school, the first school I went to in my life, a public school I went to work at, where the coordinator was very nice and cared about everyone. But at that school I didn't have anything related to mental health to report. Now at the other schools, I'm just thinking about this, you know when you go over it in your mind just to be sure? But I can't remember feeling any support for teachers or pupils at these public schools, it was all a bit unstructured in that respect.* (Elza, teacher, 12 years' experience)

Nara reports a lack of interest on the part of the school management in working with the mental health of students, saying that this is far from happening.

> *"But that's a dream, isn't it? Because public schools aren't interested [in working with mental health]."* (Nara, teacher, 20 years' experience)

Alceu says that suicidal behavior is addressed in schools when an action has repercussions on other students; there is no individual focus on a student's emotional suffering:

> *I think there's this thing about paying attention, perhaps when it becomes more obvious. That at least we are beginning to realize that there are some conversations, some comments, and then the subject can even be put on the agenda. Not because the person who was in that situation [suicidal behavior] was looked at, but because their situation had repercussions for others, with those around them, and then the subject could end up on the agenda.* (Alceu, teacher, 9 years' experience)

In Alceu's words, schools take care of students experiencing emotional distress to ensure that there are no repercussions for other students, rather than regarding them as a person in need of care. There is a fear about addressing suicide at school. The Statute of the Child and Adolescent (Child and Adolescent Statute, 1990) provides for comprehensive care for children and adolescents, with each individual representing a unique universe that requires a careful examination of their needs. Failure to care for an adolescent in emotional distress due to a lack of knowledge on the part of school management increases stigma, hampering care in these cases (Botega, 2015; Santos et al., 2014).

Marisa admits that it is difficult to work with students in the yellow September initiative because of the set activities, which disregard the fact that each school has its own routine, groups of students and needs. She says that the criteria used are quantitative, rather than what the student has understood as a result of the actions implemented:

> *[the Yellow September activities][1] come from the top down, without a study of what's happening here, because each school has its own personality, each school has its own routine, its own public, what's good for one is not good for all of them. And we experience this situation a lot, having to treat everyone as though they were the same, you know? I think this ends up creating this issue that I find myself, again, thinking about what I said a little earlier, that quantitative criteria are often considered. So there's this thing, a certain number of evaluations have to be submitted within this timeframe, and then there's that demand, that rush, so that these evaluations can be done and then the results tabulated, without taking into account, as we said, actions that can be incorporated into the school's routine and that, in fact, give meaning to what the student is experiencing there. So I think that sometimes the issue of quantity takes precedence, it weighs on us when it comes to dealing with mental health, and suicide prevention, because I imagine that it's also something that requires a purpose, let's say, or a way of thinking that can't be one-sided, that can't be something like.... You know? "This is the model and this is how it's going to be," you have to consider that you also need to pay attention to the feedback that the student is going to give you, so that you can also understand the moment they are going through.* (Marisa, teacher, two years' experience)

Marisa points out that school management focuses its attention on quantitative data in the Yellow September actions to meet the requirements of the Department of Education. These actions fail to consider the social needs and particularities of the school in the territory and may therefore not be meaningful for students. From the perspective of

[1] Yellow September is the international campaign to prevent suicide in the month of September.

Health Promotion, its fundamental principles, such as equity, empowerment and autonomy, are essential markers for evaluating actions and policies, especially at school (Ministry of Health, 2021; PAHO, 2022). The historical-cultural approach is essential for considering the economic, social, cultural and other contexts of the place where these actions are implemented, to achieve effective health. (Lima et al., 2020; Silva et al., 2023).

Including mental health in the school curriculum would be an assertive strategy as it could address this issue across all school subjects. This strategy is in line with the study by Shilubane et al. (2014), which focusses on the voices of schoolchildren, emphasizing the need to include mental health and suicide prevention in the curriculum, thereby allowing teachers to work on the subject more safely and continuously.

CONCLUSION

The historical-cultural approach is essential to understanding the production of health. The interaction between individuals and the concept of mediation are crucial to both promoting health and understanding the processes that lead to burnout and illness. From this perspective, each person is unique and has a history of specific social interactions, influenced by their culture and context. These experiences shape the way they act and think. When these factors are considered and there is an encounter between individuals, the process of signification and re-signification therefore becomes a fundamental part of mediated experiences, enabling transformations (Vygotsky, 1996). Schools have a fundamental role to play in providing a conducive environment for the development of protective factors for adolescents with suicidal behavior, by strengthening affection and bonds between peers and teachers that can be healthy. This approach to preventing suicidal behavior is unique, but actions to prevent suicide at school are limited by resistance, and lack of support and knowledge on the part of school management. In this context, there is a shortage of initiatives to promote mental health and suicide prevention and when there are actions related to the issue, they are isolated and ignore the specificity of each school. The consequence of these actions is an outdated concept of behavior (Vygotsky, 2009), which impacts the actions of school professionals in suicide prevention.

Faced with this problem, possible strategies for overcoming these challenges include incorporating mental health into the school curriculum, training nursing and education staff about suicidal behavior and recognizing the importance of health professionals in this context as mental health promoters.

The limitations of this study are related to the global context of COVID-19, which has reconfigured the ways of working and conducting scientific research.

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Conflict of interest

The authors declare that they have no conflict of interest.

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REFERENCES

Avanci, J. Q., Pinto, L. W., & Assis, S. G. (2021). Notifications, hospitalizations and deaths from self-harm in childrenin Brazil's national health systems. *Ciência & Saude Coletiva, 26*(Suppl. 3), 4895-4908. https://doi.org/10.1590/1413-812320212611.3.35202019

Bertolote, J. M. (2012). *O suicídio e sua prevenção*. São Paulo: Editora Unesp.

Botega, N. J. (2015). *Crise suicida: avaliação e manejo*. Porto Alegre: Artmed.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Brito, M. D. L. S., Silva Júnior, F. J. G., Costa, A. P. C., Sales, J. C. S., Gonçalves, A. M. S., & Monteiro, C. F. S. (2020). Suicidalbehavior and prevention strategies fromteachers'perspective. *Escola Anna Nery, 24*(4), e20200109. https://doi.org/10.1590/2177-9465-EAN-2020-0109

Castro, E. de, & Oliveira, U. T. V. de. (2022). [The semi-structuredinterviewin qualitative-interpretative research: a guide to procedural analysis]. *Entretextos, 22*(3), 25-45. https://doi.org/10.5433/1519-5392.2022v22n3p25-45

Child and Adolescent Statute. (1990). *[Law No. 8.069/1990]*. Brasília, DF: Senado Federal. Retrieved from https://www.planalto.gov.br/ccivil_03/leis/L8069.htm

Dávila Cervantes, C. A., & Luna Contreras, M. (2019). Suicide attempt in teenagers: associated factors. *Revista Chilena de Pediatría, 90*(6), 606-616. https://doi.org/10.32641/rchped.v90i6.1012

Estanislau, G. M., & Bressan, R. A. (2014). *Saúde Mental na Escola: o que os educadores devem saber*. São Paulo: Artmed.

Hawton, K., & Fortune, S. (2008). Suicidal behavior and deliberate self-harm. In M. Rutter, D. Bishop, D. Pine, S. Scott, J. Stevenson, E. Taylor, & A. Thapar (Eds.). *Rutter's Child and Adolescent Psychiatry* (5th. Ed.; pp. 648-669). Oxford, UK: Blackwell Publishing Ltd.

Hawton, K., Saunders, K. E., & O'Connor, R. C. (2012). Self-harm and suicide in adolescents. *The Lancet, 379*(9834), 2373-2382. https://doi.org/10.1016/s0140-6736(12)60322-5

Juliano, M. C. C., & Yunes, M. A. M. (2014). Reflectionson the social support network as a mechanism forthe protectionand promotionof resilience. *Ambiente & Sociedade, 17*(3), 135-154. https://doi.org/10.1590/s1414-753x2014000300009

Klonsky, E. D., May, A. M., & Saffer, B. Y. (2016). Suicide, Suicide Attempts, and Suicidal Ideation. *Annual Review of Clinical Psychology, 12*(1), 307-330. https://doi.org/10.1146/annurev-clinpsy-021815-093204

Lima, R. S., Silva, M. A. I., Andrade, L. S., Góes, F. D. S. N. D., Mello, M. A., & Gonçalves, M. F. C. (2020). Construction of professional identity in nursing students: qualitative research from the historical-cultural perspective. *Revista Latino-Americana de Enfermagem, 28,* e3284. https://doi.org/10.1590/1518-8345.3820.3284

Manzini, E. J. (2004) *Entrevista semi-estruturada: análise de objetivos e roteiros*. Educação Inclusiva UERJ. Retrieved from https://eduinclusivapesq-uerj.pro.br/entrevista-semi-estruturada-analise-de-objetivos-e-roteiro/

Minayo, M. C. S. (2013). *O desafio do conhecimento: Pesquisa qualitativa em saúde.* São Paulo: Hucitec.

Ministry of Health. (2021). Health Surveillance Secretariat. [Suicide mortality and notifications of self-harm in Brazil], *Boletim Epidemiológico, 52*(33). Retrieved from https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/edicoes/2021/boletim_epidemiologico_svs_33_final.pdf

Ornell, F., Schuch, J. B., Sordi, A. O., & Kessler, F. H. P. (2020). "Pandemic fear" and COVID-19: mental health burden and strategies. *Revista Brasileirade Psiquiatria, 42*(3), 232-235. https://doi.org/10.1590/1516-4446-2020-0008

Pan American Health Organization. (2022). *Making every school a health promoting school: Global standards and indicators*. Retrieved from https://iris.paho.org/bitstream/handle/10665.2/55710/9789275725122_por.pdf

Polit, D. F., Beck, D. T., & Hungler, B. P. (2004). *Fundamentos de pesquisa em enfermagem: métodos, avaliação e utilização* (5a Ed.). Porto Alegre: Artmed.

Santos, J. C. P., Erse, M. P. Q. A., Façanha, J. D. N., Marques, L. A. F. A., & Simões, R. M. P. (2014). *[Monograph Health Education and Research: + Contigo: Promoting Mental Health and Preventing Suicidal Behavior in the Educational Community]*. Ed. Unidade de Investigação em Ciências da Saúde, Enfermagem Escola Superior de Enfermagem de Coimbra.

Shilubane, H. N., Ruiter, R. A., Bos, A. E., Reddy, P. S., & van den Borne, B. (2014). High school students' knowledge and experience with a peer who committed or attempted suicide: a focus group study. *BMC Public Health, 14*(1), 1081. https://doi.org/10.1186/1471-2458-14-1081

Silva, J. K. B. da, Dias, M. G. P. F., & Andrade, L. S. de. (2023). Women's perspective on prevention of pregnancy in adolescence and health actions at school. *Revista Ibero-Americana de Estudos em Educação, 18*(00), e023032. https://doi.org/10.21723/riaee.v18i00.17207

Souza, F.N., Costa, A.P., Moreira, A., Souza, D. N., & Freitas, F. (2016). *webQDA: manual de utilização rápida.* Aveiro: UA Editora, Retrieved from https://app.webqda.net/Fontes/Manual_de_Utilizacao_webQDA.pdf

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care, 19*(6), 349-357. https://doi.org/10.1093/intqhc/mzm042

Vinuto, J. (2014). A amostragem em bola de neve na pesquisa qualitativa: um debate em aberto. *Temáticas, 22*(44), 203-220. https://doi.org/10.20396/tematicas.v22i44.10977

Vygotsky, L. S. (1996). *Obras escogidas: psicología infantil, Tomo IV*. Madrid: Visor Dist. S. A.

Vygotsky, L. S. (2009). *A construção do pensamento e da linguagem*. São Paulo: Martins Fontes.

World Health Organization [WHO]. (2016). *World Health Statistics data visualizations dashboard. Suicide*. Retrieved from http://apps.who.int/gho/data/node.sdg.3-4-viz-2?lang=en

World Health Organization [WHO]. (2020). *Guidelines on mental health promotive and preventive interventions for adolescents: helping adolescents thrive*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/336864/9789240011854-eng.pdf

World Health Organization [WHO]. (2023). *Suicide prevention*. Retrieved from https://www.who.int/health-topics/suicide#tab=tab_1

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Evaluation of a Brief Mindfulness-based Intervention to Prevent Problematic Substance Use among First-year Medical Students

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ABSTRACT

Introduction. Beginning a degree in medicine involves a significant change in a student's lifestyle, particularly during the early years, since stressful situations are difficult to address. **Objective.** To evaluate the effectiveness of Mindfulness Based Intervention (MBI) in medical students to reduce problematic substance use, stress, anxiety, and depressive symptomatology. **Method.** Experimental study of two groups with simple random assignment in a sample comprising 320 students. **Results.** The mean age of participants was 19; 85% reported having consumed alcohol at some time in their lives, 48% tobacco and 18% cannabis. Alcohol and tobacco use decreased slightly from baseline to follow-up in the group that received a MBI. At the same time, there was a statistically significant decrease in stress in the experimental group and anxiety decreased in both groups with statistically significant changes due to a probable imitation effect. **Discussion and conclusion.** The downward trend in alcohol and tobacco consumption could have intensified if the full intervention program had been completed, as observed in other studies in which five or more MBI sessions were given, achieving significant improvement. The reduction in the level of the variables examined coincides with studies showing the benefits of MBI as a mechanism for emotional regulation to cope with adverse events.

Keywords: Students, anxiety, depression, stress, alcohol, drugs, mindfulness.

RESUMEN

Introducción. Ingresar a la carrera de medicina implica un notorio cambio en el estilo de vida de un estudiante, especialmente durante los primeros años, ya que se presentan situaciones estresantes difíciles de enfrentar. **Objetivo.** Evaluar la efectividad de una intervención basada en la Atención Plena (AP) en estudiantes de medicina para atenuar el uso problemático de sustancias, el estrés, la ansiedad y la sintomatología depresiva. **Método.** Estudio experimental de dos grupos con asignación aleatoria simple. La muestra estuvo conformada por 320 estudiantes. **Resultados.** 69% fueron mujeres y el resto hombres, la media de edad de los participantes fue de 19 años; 85% reportaron haber consumido alcohol alguna vez en la vida, 48% tabaco y 18% cannabis. El consumo de alcohol y de tabaco disminuyó ligeramente de la línea base al seguimiento en el grupo que recibió la AP. A su vez, el estrés tuvo también una disminución estadísticamente significativa en el grupo experimental y la ansiedad disminuyó en ambos grupos con cambios estadísticamente significativos bajo un probable efecto de imitación. **Discusión y conclusión.** La tendencia a la baja en el consumo de alcohol y tabaco pudo haberse fortalecido una vez concluido el programa completo de intervención, como se observó de igual manera en otros estudios en que se impartieron cinco o más sesiones de AP, que muestraron mejoras significativas. La reducción en el nivel de las variables estudiadas coincide con estudios que dan cuenta de los beneficios de la AP al actuar como mecanismo de estabilización emocional frente a eventos adversos.

Palabras clave: estudiantes, ansiedad, depresión, estrés, alcohol, drogas, atención plena.

INTRODUCTION

Starting higher education involves stressful changes in the lifestyle of young people (Tian-Ci Quek et al., 2019) and is compounded by the fact that medical students are extremely competitive (Hill et al., 2018).

A low level of stress can enhance various areas of human behavior. However, when stress is present at high levels, it can be associated with depressive symptomatology, poor academic performance, substance use, the desire to drop out of school and, in extreme cases, suicidal ideation (Marcon et al., 2020; Kumar et al., 2019; Hill et al., 2018).

Recurrent exposure of students to stressful events—of varying intensity—can affect their mental health. Thus, for example, the percentage of depression in medical students ranges from 14.3 to 57.6%, while the percentage for anxiety in this same group ranges from 7.7 to 65.5% (Kumar et al., 2019; Tian-Ci et al., 2019; Zeng et al., 2019; Kunwar et al., 2016; Hope & Henderson, 2014). Hill et al. (2018) conducted a study of 978 medical students, finding that 11.2% described their stress as severe and debilitating, while 68.6% considered it significant yet manageable.

Karyotaki et al. (2020) conducted research on first-year medical students from nine countries, including Mexico, observing percentages of depression and anxiety of 13.4 and 13.1%. Benjet et al. (2019) found that first-year students presented similar percentages indicative of suicide attempt (23%), depression (12.6%) and anxiety (13.6%) to those of international studies.

Stress is also associated with alcohol and drug use (Molodynski et al., 2020). Marcon et al. (2020), Steiner-Hofbauer & Holzinger (2020) and Kushwaha et al. (2019) found that 59.6% of a sample of medical students reported alcohol use, 28.2% tobacco use and 11.9% marijuana use. In the case of Mexican students, 46% were found to consume alcohol in alarming amounts (Puig-Nolasco et al., 2011).

Given the evidence of the problems described, programs have been developed to enhance mental health and reduce anxiety, depression and stress levels (Slavin & Chibnall, 2016), as well as suicidal ideation (Witt et al., 2019). Medical students and certain schools have begun to include self-care programs in their syllabuses (Hassed et al., 2008) to provide students with strategies to manage stress and reduce drug use.

One approach used is the Mindfulness-Based Intervention (MBI), whose philosophical, epistemological, theoretical, and phenomenological tenets are based on Buddhism and meditation. It focuses on awareness, attention, acceptance, and remembrance; promotes the observation of the present reality, the understanding of the body and mind, and provides a new understanding of the experiences, sensations, emotions, and thoughts of each person without judgment (Oró et al., 2021; Peláez et al., 2021; Vásquez-Dextre, 2016; Nyanaponika, 1962).

MBI comprises two components: self-regulation of attention and coping with experiences. According to this approach, it is assumed that it is possible to enable people to reduce stress, anxiety, depression and substance use (Tanay et al., 2012). MBIs promote physical and emotional well-being, which is why they have been used in various therapeutic and educational contexts, sometimes with the incorporation of electronic devices (Diez & Castellanos, 2022; Errasti-Pérez et al., 2022; Döllinger et al., 2021; Wielgosz et al., 2019; Kabat-Zinn, 2015; Vettese et al., 2009; Goldin & Gross, 2010).

Several studies have observed an improvement in those who received an MBI, in comparison with control groups with stress, depressive, somatic, anxious and emotional exhaustion symptoms, in the perception of their quality of life, perceived difficulty, personal and social well-being, burnout and, of course, drug use. They were also observed to have better treatment adherence (Félix-Junior et al., 2022; Bazzano et al., 2022; Kriakous et al., 2020; Chmielewski & Łuczyński, 2021; Oró et al., 2021; Zemestani & Fazeli Nikoo, 2020; Buizza et al., 2020; Kwok et al., 2019; Lomas et al., 2018; Ruiz-Fernández et al., 2019; Spinelli et al., 2019).

Likewise, studies such as those by Nogueira et al. (2022), López et al. (2021), Santiago & Urcuhuaranga (2021), Zúñiga et al. (2021), Alvarado & Daza (2020) and Buizza et al. (2020), have observed positive results in the improvement of stress management, burnout, resilience, concentration, attention, anxiety, motivation, self-acceptance and social support among medical students.

Single et al. (2019) found that behaving with awareness, nonjudgment, and nonreactivity to internal experience predicted decreased alcohol consumption, which was mediated by low levels of emotional psychopathology.

Li et al. (2017) conducted a systematic review of studies evaluating MBI interventions for substance use. They observed a reduction in substance use, craving, and withdrawal symptoms at the end of treatment and at follow-up in subjects who had received the intervention compared to those who had received treatment as usual, such as relapse prevention, cognitive behavioral therapy and/or joining a support group. This review was updated by Korecki et al. (2020), finding the same results.

Finally, it has been observed that MBI can reduce the likelihood of drug and alcohol use among students directly or through emotion regulation (Garland et al., 2022; Nosratabadi & Halvaiepour, 2019; Black et al., 2011).

The aim of the present article was therefore to evaluate the effectiveness of an MBI in medical students to prevent problematic substance use, stress, anxiety and depressive symptomatology.

METHOD

Study design

We used an experimental study of two groups with simple random assignment.

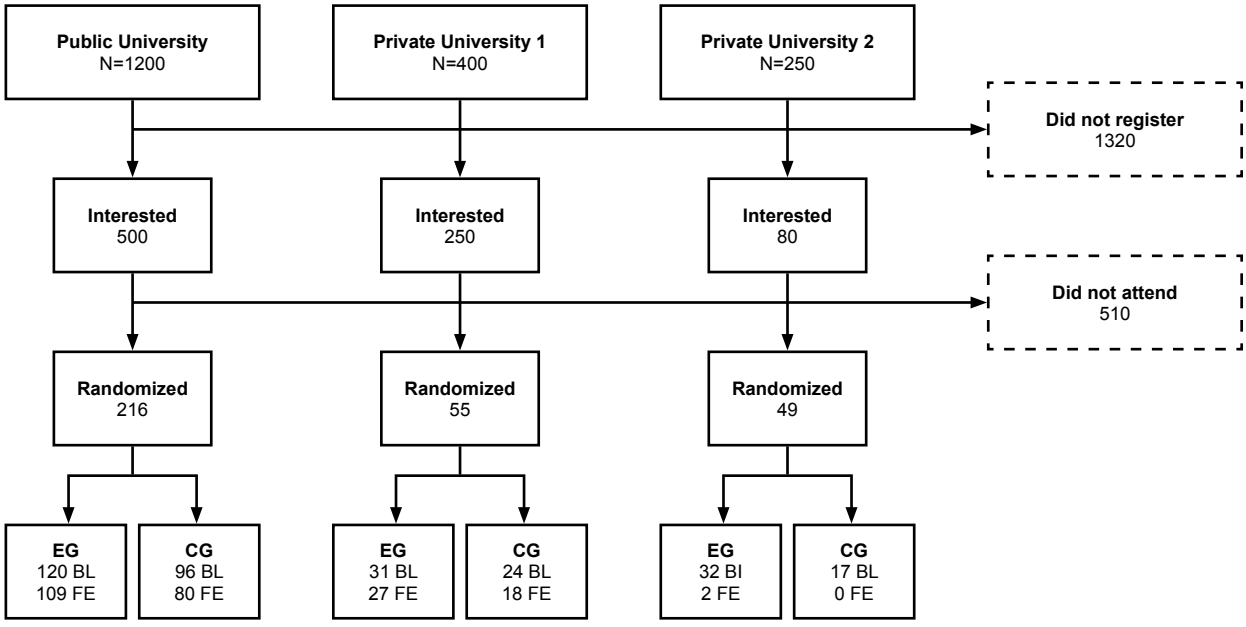
Sample description

The study was conducted at three universities in Mexico City, one public and two private, from October 2019 to March 2020. A total of 2,150 students were invited to participate, of which 830 showed interest in participating in the workshops. Three hundred and twenty were randomized and divided into two groups: experimental and control, after filling in the informed consent form, meeting the inclusion criteria and completing the baseline (BL), and 236 completed the final evaluation (FE) (Figure 1).

Measurements

The questionnaire comprised the following six sections:

1. *Sociodemographic data***.** This section comprised 16 questions on sex, age, pregnancy status, date of birth, place of birth, school, group, medical diagnosis, specific diagnosis, medication intake, specific medication, pharmacological treatment for psychiatric or neurological problems, name, email, cell phone, and other means of contact. For the purposes of the study, the seven main variables are reported in the results and tables sections: sex, age, birthplace, school, medication intake, medical diagnosis, pharmacological treatment.
2. *Perceived Stress Scale (PSS)*. Developed by Cohen et al. (1983), this scale assessing the level of perceived stress during the past month comprises 14 items with a five-point Likert-type response format (0 = never to 4 = very often). The total PSS score is obtained by inverting the scores of items 4, 5, 6, 7, 9, 10 and 13 and adding the 14 items, with a higher score corresponding to a higher level of perceived stress. The results of the adaptation tested in a Mexican population, conducted by González et al., (2007), indicate adequate internal consistency (α = .83).
3. *Beck Anxiety Inventory* (BAI). Comprises 21 items describing common anxiety symptoms and assesses the degree of distress of each item during the past week on a 4-point Likert-type scale (0 = not at all to 3 = severely). According to Beck et al. (1993), the BAI showed internal consistency of .92. The Mexican version for adults has obtained alphas of .94 and .83 (Hernández et al. 2022; Robles et al., 2001).
4. *Beck Depression Inventory* (BDI). Developed by Beck et al. (1987), this inventory comprises 21 items describing common depression symptoms, used to evaluate the degree of distress of students in the past week on a 4-point Likert-type scale (0 = absence to 3 = maximum severity). The total score is obtained from the sum of the items,



Note: EG= Experimental group, CG= Control group, BI- Baseline, FE= Final evaluation.

Figure 1. Consort Flow Diagram.

with a score above 10 indicating the presence of depression. Jurado et al. (1998) translated, adapted, and standardized the inventory for the Mexican population, with adequate concurrent validity (r = .70) and high internal consistency (α = .87), while Hernández et al. (2022) obtained internal consistency of .92.

5. *Five Facets of the Mindfulness Questionnaire* (*FFMQ-M*; Baer et al., 2006; Baer et al., 2008). The questionnaire comprises 39 items with a 5-point Likert-type response format (1 = never to 5 = very often), measuring mindfulness, based on five main facets: "Observing," "Describing," "Acting with Awareness," "Not judging the internal experience," "Not reacting to the internal experience" and "Taking a step back." The questionnaire has been validated in the Spanish population by Cebolla et al. (2012) and in the Mexican population by Meda et al. (2015).
6. *Alcohol, Tobacco and Substance Use Screening Test (ASSIST)*. This test identifies the use of tobacco, alcohol, marijuana, cocaine, amphetamine-type stimulants, inhalants, sedatives, hallucinogens, opiates, and other drugs. It comprises eight questions enquiring about use and associated problems in the past three months (Ali et al., 2002). Each substance is assessed for a risk score: low (0-3 points), moderate (4-26 points) and high risk (> 26 points). International studies have reported both validity and reliability, with a test-retest coefficient of .58-.90 and internal consistency of .80. Internal consistency of .87 was found in the Mexican population (Tiburcio et al., 2016; Khan et al., 2011).

Procedure

An agreement was initially sought with three universities. Once this had been established, first-year medical students were invited to participate through a poster and information sessions, the standard pre-pandemic means employed at institutions for this purpose. Interested students were offered more information about the project and invited to participate in the study and to sign the informed consent form. The control and experimental groups were formed with students from the three universities and BL measurements taken of each group. The experimental group received an intervention based on MBI, through five two-hour sessions. At the end of the intervention, the final evaluation was administered, using the same instruments as in the BL.

Inclusion and exclusion criteria

- *Inclusion criteria:* First-semester medical students at the time of the study, who agreed to participate voluntarily.
- *Exclusion:* Presence of severe pathology or receiving any type of psychotherapy at the time of the study or in the past six months.
- *Elimination:* failure to complete the registration and/or the interventions, and conditions that prevented them from answering the questionnaires or participating in the interventions (such as headaches, wakefulness, nausea, and the influence of psychoactive substances).

Data analysis

Frequencies and measures of central tendency were obtained for each question. To establish comparisons by demographic data, X^2 or Student's t analyses were performed according to the level of measurement of each variable. Analysis of variance (*ANOVA*) was calculated using treatment condition as the independent variable. Data were analyzed using the IBM SPSS v26 statistical software. For the purposes of the analysis, the control groups from the three universities and the experimental groups were combined.

Ethical considerations

The present study constituted minimal risk research because the main objective was to promote the emotional well-being of participants. The original research protocol was approved by the Fundación Gonzalo Río Arronte and the Ethics Committee of the Medicine Faculty (FM/DI/098/2019).

RESULTS

Sample characteristics: 137 (42.8%) of the randomized students were in the control group and 183 (57.2%) in the experimental group. Most of the participants were female (69.4%), with a mean age of 19 (SD = 1.5±). Regarding their place of birth, 51% were originally from Mexico City and 67.5% studied at a public university. It is worth noting that 13.1% reported taking some form of medication, 15.5% had been given a medical diagnosis and 5.9% were under pharmacological treatment for a psychiatric or neurological problem (Table 1).

In terms of substance use, alcohol was the substance most commonly reported by students, with 85.3% of lifetime users, followed by tobacco (47.8%) and cannabis (18.4%). Although the use of other substances was reported, percentages were so low that they were not included in the following analyses (Figure 2).

With respect to the difference in risky consumption between the control and experimental groups, significant differences were only found in tobacco use levels, with 10.1% of members of the experimental group presenting a high risk of tobacco dependence (Table 2).

Table 1
Demographic Characteristics of Sample

	Control n=137		*Experimental n=183*		*Total N=320*		
	f	%	f	%	f	%	X /gl²
Sex							
Male	41	29.9	57	31.1	98	30.6	.055/1
Female	96	70.1	126	68.9	222	69.4	
Age							
17-18	55	40.1	88	48.1	143	44.7	8.834/2*
19-20	67	48.9	61	33.3	128	40.0	
21 or older	15	10.9	34	18.6	49	15.3	
Birthplace							
Mexico City	69	70.4	95	68.8	164	69.5	2.869/2
Mexico state	23	23.5	26	18.8	49	20.8	
Another Mexican state	6	6.1	17	12.3	23	9.7	
University							
Public	96	70.1	120	65.6	216	67.5	1.569/2
Private	41	29.9	63	34.4	104	32.5	
Currently taking medication							
No	123	89.8	155	84.7	278	86.9	1.774/1
Yes	14	10.2	28	15.3	42	13.1	
Medical diagnosis							
No	117	85.4	153	83.6	270	84.4	.191/1
Yes	20	14.6	30	16.4	50	15.6	
Receiving pharmacological treatment for a psychiatric/ neurological problem							
No	131	95.6	171	93.7	302	94.4	.700/1
Yes	6	4.4	12	6.6	18	5.6	

* $p \leq .05$.

Stress underwent a statistically significant decrease in the experimental group; and anxiety decreased in both groups with statistically significant changes. However, depression showed a statistically significant increase in both the experimental and control groups (Table 3).

It is important to note that although there were no statistically significant differences in substance use, there was a slight decrease in tobacco and alcohol use in the baseline follow-up of the group that received the MBI.

DISCUSSION AND CONCLUSION

The aim of the present study was to evaluate the effectiveness of a Mindfulness-based intervention in medical students to prevent stress, anxiety, depressive symptomatology, and problematic substance use. The study was conceptualized and undertaken in keeping with the mental health status of students at the levels of the pre-pandemic context. In this regard, 85% of the students surveyed reported lifetime use of alcohol, 47.8% of tobacco and 18.4% of cannabis.

The literature review responds to a limited context regarding studies focused on substance consumption in first-year medical students in Mexico City prior to lockdown. However, some international studies (Martínez et al., 2018; Haas et al., 2018; Sommet et al., 2012; Akvardar et al., 2003) report similar percentages to this study, while others report different percentages (Lemos-Santos et al., 2024: Fernández et al., 2018; Newbury-Birch et al., 2000). Since the difference in results could be due to the different sample populations, further research is required in Mexico.

Although no statistically significant decrease in substance use was found after participants had received the intervention, a slight decrease in alcohol and tobacco use was observed in the experimental group. This trend may have increased with the completion of the full intervention

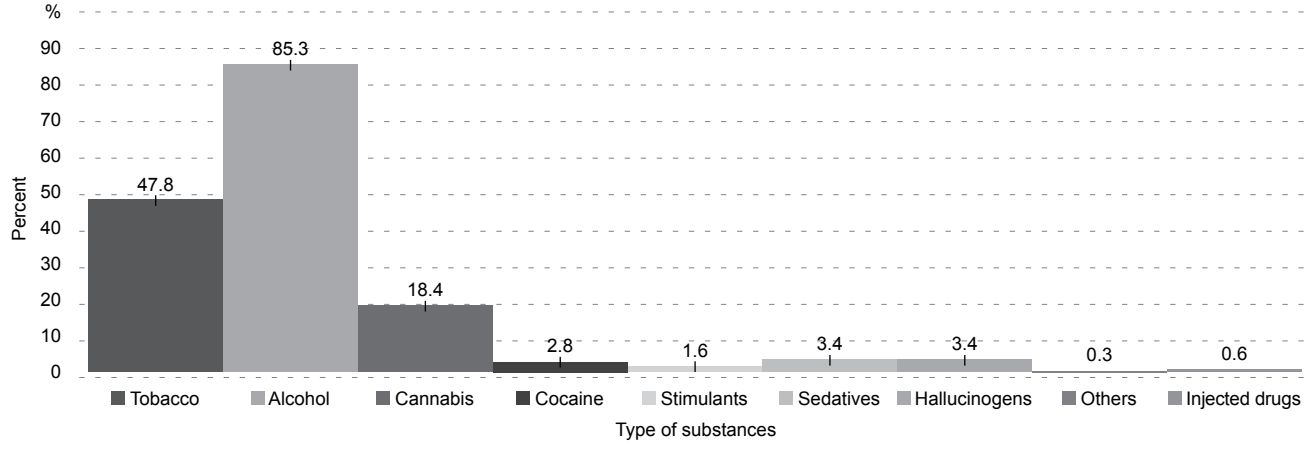


Figure 2. Lifetime Substance Use

Table 2
Consumption Risk

	Control n = 137		*Experimental n = 183*		*Total N = 320*		
	f	%	f	%	f	%	X /gl²
Risk of tobacco use	5	13.9	14	28.6	19	22.4	7.466/2*
Low	31	86.1	30	61.2	61	71.8	
Moderate	---	---	5	10.1	5	5.9	
High							
Risk of alcohol consumption	70	76.9	110	80.9	180	79.3	.545/2
Low	20	22.0	25	18.4	45	19.8	
Moderate	1	1.1	1	0.7	2	0.9	
High							
Risk of cannabis use	15	75.0	31	82.6	46	79.3	.346/1
Low	5	25.0	7	18.4	12	20.7	
Moderate	---	---	---	---	---	---	
High							

* $p \leq .05$.

program (Baeza-Velasco et al., 2020; Black et al., 2011), as significant improvements have been observed in studies where more than five sessions of MBI were provided, (Barros et al., 2021; Zamboni et al., 2021; Nawi et al., 2021; Goldberg et al., 2021; Wupperman et al., 2019; Cavicchioli et al., 2019).

The results also indicate that stress symptoms decreased with statistically significant differences in the group receiving the MBI, consistent with what has been reported in other studies with medical students (Polle, & Gair, 2021; Daya & Hearn, 2017; Khoury et al., 2015), in which students' improvement was attributed to increased awareness, and recognition of levels of tension, pain, bodily and mental rigidity.

The literature points out that although MBI achieves positive results in cross-sectional studies, these studies are still considered to have certain limitations in regard to the safety of medium and long-term effects, so it is suggested that actions designed to narrow these gaps be implemented, as this could enhance the effectiveness of MBI in this population (Sekhar et al., 2021).

At the same time, a decrease in anxiety symptoms was found, coinciding with the systematic review by Krishnan et al. (2022), in which significant decreases were observed in various studies worldwide. Anxiety is regarded as one of the most prevalent problems (Aljuwaiser et al., 2023) and one of the most intractable among students themselves, as they perceive it as "a complication inherent to the nature of the degree course" due to the academic workload, the competitiveness of the environment and the uncertainty regarding job opportunities in the future (Tian-Ci et al., 2019; Hill et al., 2018).

The study was conducted at the beginning of the pandemic (October 2019-March 2020), a period that overlapped with the first cases of COVID 19 in Mexico (January-February 2020) as reported by WHO (2020) and the Ministry of Health (2020). The outbreak of the pandemic may have contributed to the significant increase in depressive symptoms in both the control and experimental groups, as the uncertainty and fear caused by the announcement of lockdown affected medical, paramedical and trainee staff more than the general population or students in other degree courses (Piñel et al., 2021; Shao et al., 2020). The uncertainty and fear were partly due to concerns about the negative impact of COVID-19 on education, employment and their future (Xie et al., 2021).

This study has several limitations. It began before the pandemic and was conducted at the beginning of the latter, which did not allow for effective follow-up of participants. Moreover, the announcement of lockdown may have influenced answers in the evaluations of the two groups. Due to the limited availability of universities and the restrictions

Table 3
Results by Control and Experimental Group

	Baseline				*Final Evaluation*				*Total*					
	CG		*EG*		*CG*		*EG*		*BL*		*FE*			
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	t	p
Variables														
Stress	34.04	4.09	34.13	4.51	33.03	5.43	32.96	6.37	34.09	4.33	32.99	5.99	6.713	.010
Anxiety	17.94	10.86	15.88	11.00	15.33	11.71	14.39	11.50	16.74	10.97	14.78	11.57	14.574	< .001
Depressive symptomatology	52.15	10.25	54.06	9.20	55.16	11.12	57.23	10.33	53.27	9.68	56.37	10.69	1093.20	< .001
Tobacco	8.00	4.77	9.42	8.22	9.50	5.64	8.50	7.24	9.00	7.26	8.80	6.66	.077	.785
Alcohol	12.16	8.84	8.85	7.63	12.00	7.64	8.64	7.75	9.85	7.92	9.65	7.67	.022	.885

Note: EG = Experimental group; CG = Control group; gl = 1.

imposed by lockdown (Delgado et al., 2021), the eight sessions originally planned were reduced to five. However, the literature suggests that seven or more sessions are required for the internationalization of MBI principles in participants (Oró et al., 2021).

Given the importance of positively impacting the mental health of medical students, recommendations for future research include the following:

1. The use of manuals resulting from this experience, such as the "Mindfulness Instructor's Manual for Mental Health Professionals" and the "User's Manual on the Mindfulness Technique for students and the general public."
2. Include other study variables, such as suicidal ideation, which can be by MBI (Bazzano et al., 2022).
3. Incorporate MBI into the curriculum, so that it influences all levels of training, to prevent drop out and emotional and behavioral problems derived from the strain inherent to professional training.

Finally, it should be noted that the COVID-19 epidemic was a phenomenon that was not considered at the beginning of the research. There were no indicators to suspect its outbreak or the subsequent lockdown stage, as a result of which students lost contact with the research team and each other, due, among other causes, to dropping out of their degree courses, returning to their places of origin (the provinces) and being assigned to hospitals to attend patients with COVID-19. In addition, the use of social networks was not as widespread as it is today, which made data collection difficult. However, despite these setbacks, relevant data supporting the efficacy of MBI for the management of substance use were obtained.

The results achieved through a reduction of stress and anxiety symptoms coincide with other studies showing the benefits of MBI, which serves as an emotional regulation mechanism in the face of adverse events. Likewise, substance use showed a downward trend. However, since these findings are not conclusive for this study population, it is suggested that the subject be further explored with other medical students, who present frequently situations of emotional imbalance.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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REFERENCES

Akvardar, Y., Demiral, Y., Ergör, G., Ergör, A., Bilici, M., & Akil Özer, Ö. (2003). Substance use in a sample of Turkish medical students. *Drug and Alcohol Dependence, 72*(2), 117-121. https://doi.org/10.1016/s0376-8716(03)00192-3

Ali, R., Awwad, E., Babor, T., Bradley, F., Butau, T., Farrell, M., Formigoni, M. L. O. S., Isralowitz, R., Boerngen de Lacerda, R., Marsden, J., McRee, B., Monteiro, M., Pal, H., Rubio-Stipec, M., & Vendetti, J.(WHO ASSIST Working Group) (2002). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): Development, reliability and feasibility. *Addiction, 97*(9), 1183–1194. https://doi.org/10.1046/j.1360-0443.2002.00185.x

Aljuwaiser, S., Brazzelli, M., Arain, I., & Poobalan, A. (2023). Common mental health problems in medical students and junior doctors – an overview of systematic reviews. *Journal of Mental Health, 33*(6), 779-815. https://doi.org/10.1080/09638237.2023.2278095

Alvarado, E. & Daza, L. (2020). Mindfulness and its contribution to emotional balance in medical and nursing students at the Fundación Universitaria Juan N. Corpas. In: : Luis Miguel Piñeros, Luis Miguel Pombo, Carol A. Zuluaga & Liliana A. Naranjo (eds), *Anuario de Investigación 2019-2020* (pp. 33-34), Fundación Universitaria Juan N. Corpas, Bogotá, Colombia.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using Self-Report Assessment Methods to Explore Facets of Mindfulness. *Assessment, 13*(1), 27-45. https://doi.org/10.1177/1073191105283504

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, J. M. G. (2008). Construct Validity of the Five Facet Mindfulness Questionnaire in Meditating and Nonmeditating Samples. *Assessment, 15*(3), 329-342. https://doi.org/10.1177/1073191107313003

Baeza-Velasco, C., Genty, C., Jaussent, I., Benramdane, M., Courtet, P., & Olié, E. (2020). Study protocol of a multicenter randomized controlled trial of mindfulness-based intervention versus relaxation to reduce emotional exhaustion in medical students in France: the "Must prevent" study. *BMC Psychiatry, 20*(1), https://doi.org/10.1186/s12888-020-02529-9

Barros, V. V., Opaleye, E. S., Demarzo, M., Curado, D. F., Bowen, S., Hachul, H., & Noto, A. R. (2021). Effects of Mindfulness-Based Relapse Prevention on the Chronic use of Hypnotics in Treatment-Seeking Women with Insomnia: a Randomized Controlled Trial. *International Journal of Behavioral Medicine, 29*(3), 266-277. https://doi.org/10.1007/s12529-021-10002-4

Bazzano, A. N., Sun, Y., Chavez-Gray, V., Akintimehin, T., Gustat, J., Barrera, D., & Roi, C. (2022). Effect of Yoga and Mindfulness Intervention on Symptoms of Anxiety and Depression in Young Adolescents Attending Middle School: A Pragmatic Community-Based Cluster Randomized Controlled Trial in a Racially Diverse Urban Setting. *International Journal of Environmental Research and Public Health, 19*(19), 12076. https://doi.org/10.3390/ijerph191912076

Beck, A., Epstein, N., Brown, G. & Steer, R. (1993). Beck anxiety inventory. *Journal of consulting and clinical psychology, 56*(6). https://doi.org/10.1037/t02025-000

Beck, A., Steer, R. & Brown, G.. (1987). *Beck depression inventory*. New York: Harcourt Brace Jovanovich.

Benjet, C., Gutiérrez-García, R. A., Abrego-Ramírez, A., Borges, G., Covarrubias-Díaz, A., Durán, M. D. S., González-González, R., Hermosillo-de la Torre, A. E., Martínez-Martínez, K. I., Medina-Mora, M. E., Mejía-Zarazúa, H., Pérez-Tarango, G., Zavala-Berbena, M. A., & Mortier, P. (2019). Psychopathology and self-harm among incoming first-year students in six Mexican universities. *Salud Pública de México, 61*(1), 16. https://doi.org/10.21149/9158

Black, D. S., Semple, R. J., Pokhrel, P., & Grenard, J. L. (2011). Component Processes of Executive Function—Mindfulness, Self-control, and Working Memory—and Their Relationships with Mental and Behavioral Health. *Mindfulness, 2*(3), 179-185. https://doi.org/10.1007/s12671-011-0057-2

Buizza, C., Ciavarra, V., & Ghilardi, A. (2020). A Systematic Narrative Review on Stress-Management Interventions for Medical Students. *Mindfulness, 11*(9), 2055-2066. https://doi.org/10.1007/s12671-020-01399-2

Cavicchioli, M., Movalli, M., & Maffei, C. (2019). Difficulties with emotion regulation, mindfulness, and substance use disorder severity: the mediating role of self-regulation of attention and acceptance attitudes. *The American Journal of Drug and Alcohol Abuse, 45*(1), 97-107. https://doi.org/10.1080/00952990.2018.1511724

Cebolla, A., García-Palacios, A., Soler, J., Guillen, V., Baños, R., & Botella, C. (2012). Psychometric properties of the Spanish validation of the Five Facets of Mindfulness Questionnaire (FFMQ). *The European Journal of Psychiatry, 26*(2), 118-126. https://doi.org/10.4321/s0213-61632012000200005

Chmielewski, J., Łoś, K., & Łuczyński, W. (2021). Mindfulness in healthcare professionals and medical education. *International Journal of Occupational Medicine and Environmental Health, 34*(1), 1-14. https://doi.org/10.13075/ijomeh.1896.01542

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A Global Measure of Perceived Stress. *Journal of Health and Social Behavior, 24*(4), 385-396. https://doi.org/10.2307/2136404

Daya, Z., & Hearn, J. H. (2017). Mindfulness interventions in medical education: A systematic review of their impact on medical student stress, depression, fatigue and burnout. *Medical Teacher, 40*(2), 146-153. https://doi.org/10.1080/0142159x.2017.1394999

Delgado Ramos, G. C., Zanella, R., Cota Araiza, L., & López Torres, R. (2021). Impacto de la pandemia COVID-19 en la investigación y docencia en las nanociencias y la nanotecnología en México. Mundo Nano. *Revista Interdisciplinaria en Nanociencias y Nanotecnología, 14*(27), 1e-19e. https://doi.org/10.22201/ceiich.24485691e.2021.27.69685

Diez, G. G., & Castellanos, N. (2022). Investigación de mindfulness en neurociencia cognitiva. *Revista de Neurología, 74*(5), 163-169. https://doi.org/10.33588/rn.7405.2021014

Döllinger, N., Wienrich, C., & Latoschik, M. E. (2021). Challenges and Opportunities of Immersive Technologies for Mindfulness Meditation: A Systematic Review. *Frontiers in Virtual Reality, 2*, https://doi.org/10.3389/frvir.2021.644683

Errasti-Pérez, J., Al-Halabí, S., López-Navarro, E. & Pérez-Álvarez, M. (2022). Mindfulness: Whyitmayworkandwhy it is sure to succeed. *Behavioral Psychology / Psicología Conductual, 30*(1), 235-248. https://doi.org/10.51668/bp.8322112s

Fernández VAT, Geroy FA, Pérez RGI, Naranjo HL, Villafuerte RY. (2018). Sexual behavior of first year medical students at the Cienfuegos Medical Faculty. Influence of the gender role in risky conducts. *Medisur, 16*(2). https://www.medigraphic.com/cgi-bin/new/resumenI.cgi?IDARTICULO=81599.

Félix-Junior, I. J., Donate, A. P. G., Noto, A. R., Galduróz, J. C. F., Simionato, N. M., & Opaleye, E. S. (2022). Mindfulness-based interventions in inpatient treatment for Substance Use Disorders: A systematic review. *Addictive Behaviors Reports, 16*, 100467. https://doi.org/10.1016/j.abrep.2022.100467

Garland, E. L., Hanley, A. W., Nakamura, Y., Barrett, J. W., Baker, A. K., Reese, S. E., Riquino, M. R., Froeliger, B., & Donaldson, G. W. (2022). Mindfulness-Oriented Recovery Enhancement vs Supportive Group Therapy for Co-occurring Opioid Misuse and Chronic Pain in Primary Care. *JAMA Internal Medicine, 182*(4), 407. https://doi.org/10.1001/jamainternmed.2022.0033

Goldberg, S. B., Pace, B., Griskaitis, M., Willutzki, R., Skoetz, N., Thoenes, S., Zgierska, A. E., & Rösner, S. (2021). Mindfulness-based interventions for substance use disorders. *Cochrane Database of Systematic Reviews, 2021*(10), https://doi.org/10.1002/14651858.cd011723.pub2

Goldin, P. R., & Gross, J. J. (2010). Effects of mindfulness-based stress reduction (MBSR) on emotion regulation in social anxiety disorder. *Emotion, 10*(1), 83-91. https://doi.org/10.1037/a0018441

González Ramírez, M. T. & Landero Hernández, R. (2007). Factor Structure of the Perceived Stress Scale (PSS) in a Sample from Mexico. *The Spanish Journal of Psychology, 10*(1), 199-206. https://doi.org/10.1017/s1138741600006466

Haas, A. L., Wickham, R. E., McKenna, K., Morimoto, E., & Brown, L. M. (2018). Evaluating the Effectiveness of a Medical Amnesty Policy Change on College Students' Alcohol Consumption, Physiological Consequences, and Helping Behaviors. *Journal of studies on alcohol and drugs, 79*(4), 523–531. PMID: 30079866.

Hassed, C., de Lisle, S., Sullivan, G., & Pier, C. (2008). Enhancing the health of medical students: outcomes of an integrated mindfulness and lifestyle program. *Advances in Health Sciences Education, 14*(3), 387-398. https://doi.org/10.1007/s10459-008-9125-3

Hernández Hernández, V. A., Marrufo, R. M., Esparza Del Villar, O. A., & Robles Ramírez, A. J. (2022). Validation of the Beck scales (anxiety and depression) in a border population (northern Mexico) during the COVID-19 pandemic. *Sapienza: International Journal of Interdisciplinary Studies, 3*(5), 155-168. https://doi.org/10.51798/sijis.v3i5.452

Hill, M. R., Goicochea, S., & Merlo, L. J. (2018). In their own words: stressors facing medical students in the millennial generation. *Medical Education Online, 23*(1), 1530558. https://doi.org/10.1080/10872981.2018.1530558

Hope, V., & Henderson, M. (2014). Medical student depression, anxiety and distress outside North America: a systematic review. *Medical Education, 48*(10), 963-979. https://doi.org/10.1111/medu.12512

Jurado, S., Villegas, M., Méndez, L., Rodríguez, F., Loperena, V., & Varela, R. (1998). La estandarización del Inventario de Depresión de Beck para los residentes de la Ciudad de México. *Salud Mental, 21*(3), 26-31.

Kabat-Zinn, J. (2015). Mindfulness. *Mindfulness, 6*(6), 1481-1483. https://doi.org/10.1007/s12671-015-0456-x

Karyotaki, E., Cuijpers, P., Albor, Y., Alonso, J., Auerbach, R. P., Bantjes, J., Bruffaerts, R., Ebert, D. D., Hasking, P., Kiekens, G., Lee, S., McLafferty, M., Mak, A., Mortier, P., Sampson, N. A., Stein, D. J., Vilagut, G., & Kessler, R. C. (2020). Sources of Stress and Their Associations With Mental Disorders Among College Students: Results of the World Health Organization World Mental Health Surveys International College Student Initiative. *Frontiers in Psychology, 11*, https://doi.org/10.3389/fpsyg.2020.01759

Khan, R., Chatton, A., Nallet, A., Broers, B., Thorens, G., Achab-Arigo, S., Poznyak, V., Fleischmann, A., Khazaal, Y., & Zullino, D. (2011). Validation of the French Version of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). *European Addiction Research, 17*(4), 190-197. https://doi.org/10.1159/000326073

Khoury, B., Sharma, M., Rush, S. E., & Fournier, C. (2015). Mindfulness-based stress reduction for healthy individuals: A meta-analysis. *Journal of Psychosomatic Research, 78*(6), 519-528. https://doi.org/10.1016/j.jpsychores.2015.03.009

Korecki, J. R., Schwebel, F. J., Votaw, V. R., & Witkiewitz, K. (2020). Mindfulness-based programs for substance use disorders: a systematic review of manualized treatments. *Substance Abuse Treatment, Prevention, and Policy, 15*(1), 1-37. https://doi.org/10.1186/s13011-020-00293-3

Kriakous, S. A., Elliott, K. A., Lamers, C., & Owen, R. (2020). The Effectiveness of Mindfulness-Based Stress Reduction on the Psychological Functioning of Healthcare Professionals: a Systematic Review. *Mindfulness, 12*(1), 1-28. https://doi.org/10.1007/s12671-020-01500-9

Krishnan, A., Odejimi, O., Bertram, I., Chukowry, P. S., & Tadros, G. (2022). A systematic review of interventions aiming to improve newly-qualified doctors' wellbeing in the United Kingdom. *BMC Psychology, 10*(1), 1-12. https://doi.org/10.1186/s40359-022-00868-8

Kumar, B., Shah, M. A. A., Kumari, R., Kumar, A., Kumar, J., & Tahir, A. (2019). *Depression, Anxiety, and Stress Among Final-year Medical Students*. Cureus, https://doi.org/10.7759/cureus.4257

Kunwar, D., Risal, A., & Koirala, S. (2016). Study of Depression, Anxiety and Stress among the Medical Students in two Medical Colleges of Nepal. *Kathmandu University medical journal (KUMJ), 14*(53), 22–26.

Kushwaha, R., Rauniar, G. P., Koirala, B., & Mandal, N. K. (2019). Prevalence of Substance Use among Undergraduate Students in a Medical College of Nepal. *Journal of Nepal Medical Association, 57*(219), https://doi.org/10.31729/jnma.4605

Kwok, J. Y. Y., Kwan, J. C. Y., Auyeung, M., Mok, V. C. T., Lau, C. K. Y., Choi, K. C., & Chan, H. Y. L. (2019). Effects of Mindfulness Yoga vs Stretching and Resistance Training Exercises on Anxiety and Depression for People With Parkinson Disease. *JAMA Neurology, 76*(7), 755-763. https://doi.org/10.1001/jamaneurol.2019.0534

Lemos-Santos, P., Blumrich, L., Debia, J. B., Castaldelli-Maia, J. M., Suen, P. J. C., & Malbergier, A. (2024). Drug use among medical students in São Paulo, Brazil: a cross-sectional study during the coronavirus disease 2019 pandemic. *Sao Paulo Medical Journal, 142*(2), https://doi.org/10.1590/1516-3180.2022.0493.r1.150623

Li, W., Howard, M. O., Garland, E. L., McGovern, P., & Lazar, M. (2017). Mindfulness treatment for substance misuse: A systematic review and meta-analysis. *Journal of Substance Abuse Treatment, 75*, 62-96. https://doi.org/10.1016/j.jsat.2017.01.008

Lomas, T., Medina, J. C., Ivtzan, I., Rupprecht, S., & Eiroa-Orosa, F. J. (2018). A Systematic Review and Meta-analysis of the Impact of Mindfulness-Based Interventions on the Well-Being of Healthcare Professionals. *Mindfulness, 10*(7), 1193-1216. https://doi.org/10.1007/s12671-018-1062-5

López Secanell, I., Gené Morales, J., & Hernaiz Agreda, N. (2021). Mindfulness y educación física en la población universitaria. Una revisión sistemática (Mindfulness and physical education in University population. A systematic review). *Retos, 42*, 821-830. https://doi.org/10.47197/retos.v42i0.86382

Marcon, G., Massaro Carneiro Monteiro, G., Ballester, P., Cassidy, R. M., Zimerman, A., Brunoni, A. R., von Diemen, L., Hauck, S., & Passos, I. C. (2020). Who attempts suicide among medical students?. *Acta Psychiatrica Scandinavica, 141*(3), 254-264. https://doi.org/10.1111/acps.13137

Martínez, D., Martínez, F. & Velázquez, A. (2018). Alcohol and tobacco consumption in first-year students of Medicine at the University of the Basque Country. *Spanish journal of drug addiction, 43*(1). https://dialnet.unirioja.es/servlet/articulo?codigo=6453627.

Meda, R., Herrero, M., Blanco-Donoso, L., Moreno-Jiménez, B. & Palomera, A. (2015). Psychometric properties of the five facet mindfulness questionnaire (five facet mindfulness questionnaire, FFMQ-M) in Mexico. *Behavioral Psychology/ Psicologia Conductual, 23*(3). 467-487.

Molodynski, A., Lewis, T., Kadhum, M., Farrell, S. M., Lemtiri Chelieh, M., Falcão De Almeida, T., Masri, R., Kar, A., Volpe, U., Moir, F., Torales, J., Castaldelli-Maia, J. M., Chau, S. W. H., Wilkes, C., & Bhugra, D. (2020). Cultural variations in wellbeing, burnout and substance use amongst medical students in twelve countries. *International Review of Psychiatry, 33*(1-2), 37-42. https://doi.org/10.1080/09540261.2020.1738064

Nawi, A. M., Ismail, R., Ibrahim, F., Hassan, M. R., Manaf, M. R. A., Amit, N., Ibrahim, N., & Shafurdin, N. S. (2021). Risk and protective factors of drug abuse among adolescents: a systematic review. *BMC Public Health, 21*(1), https://doi.org/10.1186/s12889-021-11906-2

Newbury-Birch, D., White, M., & Kamali, F. (2000). Factors influencing alcohol and illicit drug use amongst medical students. *Drug and Alcohol Dependence, 59*(2), 125-130. https://doi.org/10.1016/s0376-8716(99)00108-8

Nogueira Pires, R., Mentz da Silva, W., Granemann Piola da Silva, R. G., Ribeiro Rossi, E., Moraes Marques, C., Meister Coelho, I. C., & Guetter Mello, R. (2022). Evaluación de intervenciones que promueven la calidad de vida de los estudiantes de medicina: una revisión sistemática. *Revista Española de Educación Médica, 3*(2), https://doi.org/10.6018/edumed.514541

Nosratabadi, M. & Halvaiepour, Z. (2019). Psychological determinants of drug abuse among male adolescents in Isfahan: A structural model. *International Journal of Preventive Medicine, 10*(27). https://doi.org/10.4103/ijpvm.IJPVM_23_17.

Nyanaponika, T. (1962). *The heart of Buddhist meditation: A handbook of mental training based on the Buddha's way of mindfulness*. London Rider & Company.

Oró, P., Esquerda, M., Mas, B., Viñas, J., Yuguero, O., & Pifarré, J. (2021). Effectiveness of a Mindfulness-Based Programme on Perceived Stress, Psychopathological Symptomatology and Burnout in Medical Students. *Mindfulness, 12*(5), 1138-1147. https://doi.org/10.1007/s12671-020-01582-5

Peláez Lopez, M. A., Lozano Zuluaga, J. J., Narváez Andrade, M. J., & Becerra Hernández, L. V. (2021). El cerebro del meditador de atención plena: de la prospección a la tarea. *Universitas Médica, 62*(4), https://doi.org/10.11144/javeriana.umed62-4.brai

Piñel, C., Gómez-Roso, M. & López, J. (2021). Percepción y ansiedad de los estudiantes de Medicina en su rotación clínica en Obstetricia durante la pandemia por COVID-19. *Revista Española de Educación Médica 2*(1):13-21 https://doi.org/10.6018/edumed.460561

Polle, E., & Gair, J. (2021). Mindfulness-based stress reduction for medical students: a narrative review. *Canadian Medical Education Journal*, https://doi.org/10.36834/cmej.68406

Puig-Nolasco, A., Cortaza-Ramirez, L., & Cristina Pillon, S. (2011). Consumo de alcohol entre estudiantes Mexicanos de medicina. *Revista Latino-Americana de Enfermagem, 19*(spe), 714-721. https://doi.org/10.1590/s0104-11692011000700008

Robles, R., Varela, R., Jurado, S. & Páez, F. (2001). The Mexican version of Beck Anxiety Inventory: Psychometric properties. *Revista Mexicana de Psicología, 18*(2), 211-218.

Ruiz-Fernández, M. D., Ortíz-Amo, R., Ortega-Galán, Á. M., Ibáñez-Masero, O., Rodríguez-Salvador, M. D. M., & Ramos-Pichardo, J. D. (2019). Mindfulness therapies on health professionals. *International Journal of Mental Health Nursing, 29*(2), 127-140. https://doi.org/10.1111/inm.12652

Santiago, S. & Urcuhuaranga, A. (2021). *Effectiveness of an intervention program in mental disorders in university students of the Unheval medical school, 2019*. Universidad Nacional Hermilio Valdizán, Published undergraduate thesis. https://hdl.handle.net/20.500.13080/6385.

Secretaría de Salud, (2020). 077. Se confirma en México caso importado de coronavirus COVID- 19. https://www.gob.mx/salud/prensa/077-se-confirma-en-mexico-caso-importado-de-coronavirus-covid-19

Sekhar, P., Tee, Q. X., Ashraf, G., Trinh, D., Shachar, J., Jiang, A., Hewitt, J., Green, S., & Turner, T. (2021). Mindfulness-based psychological interventions for improving mental well-being in medical students and junior doctors. *Cochrane Database of Systematic Reviews, 2021*(12), https://doi.org/10.1002/14651858.cd013740.pub2

Shao, R., He, P., Ling, B., Tan, L., Xu, L., Hou, Y., Kong, L., & Yang, Y. (2020). Prevalence of depression and anxiety and correlations between depression, anxiety, family functioning, social support and coping styles among Chinese medical students. *BMC Psychology, 8*(1), https://doi.org/10.1186/s40359-020-00402-8

Single, A., Bilevicius, E., Johnson, E. A., & Keough, M. T. (2019). Specific Facets of Trait Mindfulness Reduce Risk for Alcohol and Drug Use Among First-Year Undergraduate Students. *Mindfulness, 10*(7), 1269-1279. https://doi.org/10.1007/s12671-019-1092-7

Slavin, S. J., & Chibnall, J. T. (2016). Finding the Why, Changing the How: Improving the Mental Health of Medical Students, Residents, and Physicians. *Academic Medicine, 91*(9), 1194-1196. https://doi.org/10.1097/acm.0000000000001226

Sommet, A., Ferrières, N., Jaoul, V., Cadieux, L., Soulat, J., Lapeyre-Mestre, M., & Montastruc, J. (2012). Use of Drugs, Tobacco, Alcohol and Illicit Substances in a French Student Population. *Therapies, 67*(5), 429-435. https://doi.org/10.2515/therapie/2012056

Spinelli, C., Wisener, M., & Khoury, B. (2019). Mindfulness training for healthcare professionals and trainees: A meta-analysis of randomized controlled trials. *Journal of Psychosomatic Research, 120*, 29-38. https://doi.org/10.1016/j.jpsychores.2019.03.003

Steiner-Hofbauer, V., & Holzinger, A. (2020). How to Cope with the Challenges of Medical Education? Stress, Depression, and Coping in Undergraduate Medical Students. *Academic Psychiatry, 44*(4), 380-387. https://doi.org/10.1007/s40596-020-01193-1

Tanay, G., Lotan, G., & Bernstein, A. (2012). Salutary Proximal Processes and Distal Mood and Anxiety Vulnerability Outcomes of Mindfulness Training: A Pilot Preventive Intervention. *Behavior Therapy, 43*(3), 492-505. https://doi.org/10.1016/j.beth.2011.06.003

Tian-Ci Quek, T., Wai-San Tam, W., X. Tran, B., Zhang, M., Zhang, Z., Su-Hui Ho, C., & Chun-Man Ho, R. (2019). The Global Prevalence of Anxiety Among Medical Students: A Meta-Analysis. *International Journal of Environmental Research and Public Health, 16*(15), 2735. https://doi.org/10.3390/ijerph16152735

Tiburcio Sainz, M., Rosete-Mohedano, M. G., Natera Rey, G., Martínez Vélez, N. A., Carreño García, S., & Pérez Cisneros, D. (2016). Validity and Reliability of the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) in University Students. *Adicciones, 28*(1), 19. https://doi.org/10.20882/adicciones.786

Vettese, L. C., Toneatto, T., Stea, J. N., Nguyen, L., & Wang, J. J. (2009). Do Mindfulness Meditation Participants Do Their Homework? And Does It Make a Difference? A Review of the Empirical Evidence. *Journal of Cognitive Psychotherapy, 23*(3), 198-225. https://doi.org/10.1891/0889-8391.23.3.198

Vásquez-Dextre, E. R. (2016). Mindfulness: Conceptos generales, psicoterapia y aplicaciones clínicas. *Revista de Neuro-Psiquiatria, 79*(1), 42. https://doi.org/10.20453/rnp.v79i1.2767

Wielgosz, J., Goldberg, S. B., Kral, T. R., Dunne, J. D., & Davidson, R. J. (2019). Mindfulness Meditation and Psychopathology. *Annual Review of Clinical Psychology, 15*(1), 285-316. https://doi.org/10.1146/annurev-clinpsy-021815-093423

Witt, K., Boland, A., Lamblin, M., McGorry, P. D., Veness, B., Cipriani, A., Hawton, K., Harvey, S., Christensen, H., & Robinson, J. (2019). Effectiveness of universal programmes for the prevention of suicidal ideation, behaviour and mental ill health in medical students: a systematic review and meta-analysis. *Evidence Based Mental Health, 22*(2), 84-90. https://doi.org/10.1136/ebmental-2019-300082

World Health Organization "WHO". (2020). COVID-19: chronology of WHO action. https://www.who.int/es/news/item/27-04-2020-who-timeline---covid-19.

Wupperman, P., Burns, N., Pugach, C., & Edwards, E. (2019). Treatment for Individuals With Severe Mental Illness Who Use Illicit Drugs While Maintained on Methadone: Mindfulness and Modification Therapy. *The Journal of Nervous and Mental Disease, 207*(12), 1005-1011. doi:10.1097/NMD.0000000000001066.

Xie, J., Li, X., Luo, H., He, L., Bai, Y., Zheng, F., Zhang, L., Ma, J., Niu, Z., Qin, Y., Wang, L., Ma, W., Yu, H., Zhang, R., & Guo, Y. (2021). Depressive Symptoms, Sleep Quality and Diet During the 2019 Novel Coronavirus Epidemic in China: A Survey of Medical Students. *Frontiers in Public Health, 8*, https://doi.org/10.3389/fpubh.2020.588578

Zamboni, L., Centoni, F., Fusina, F., Mantovani, E., Rubino, F., Lugoboni, F., & Federico, A. (2021). The effectiveness of cognitive behavioral therapy techniques for the treatment of substance use disorders: a narrative review of evidence. T*he Journal of nervous andmental illness, 209*(11), 835-845. https://doi.org/10.1097/NMD.0000000000001381.

Zemestani, M., & Fazeli Nikoo, Z. (2020). Effectiveness of mindfulness-based cognitive therapy for comorbid depression and anxiety in pregnancy: a randomized controlled trial. *Archives of Women's Mental Health, 23*(2), 207-214. https://doi.org/10.1007/s00737-019-00962-8

Zeng, W., Chen, R., Wang, X., Zhang, Q., & Deng, W. (2019). Prevalence of mental health problems among medical students in China: A meta-analysis. *Medicine, 98*(18), e15337. https://doi.org/10.1097/md.0000000000015337

Zhang, B., Fu, W., Guo, Y., Chen, Y., Jiang, C., Li, X., & He, K. (2022). Effectiveness of mindfulness-based cognitive therapy against suicidal ideation in patients with depression: A systematic review and meta-analysis. *Journal of Affective Disorders, 319*, 655-662. https://doi.org/10.1016/j.jad.2022.09.091

Zúñiga, D., Torres-Sahli, M., Nitsche, P., Echeverría, G., Pedrals, N., Grassi, B., Cisternas, M., Rigotti, A., & Bitran, M. (2021). Reduced burnout and higher mindfulness in medical students after a self-care program during the COVID-19 pandemic. *Revista médica de Chile, 149*(6), 846-855. https://doi.org/10.4067/s0034-98872021000600846

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Efficacy of Probiotics, Prebiotics, and Symbiotics for the Treatment of Depression: A meta-review

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ABSTRACT

Background. Recent research has highlighted the importance of nurturing and strengthening the intestinal microbiota due to its relationship with mental health, which has implications for the prevention and management of mental diseases such as depressive disorders. One opportunity to address this is supplementation with live microorganisms called probiotics or substances that promote their development called prebiotics, or both (symbiotics). **Objective.** This study aims to explore the existing literature on the efficacy of probiotics, prebiotics, and symbiotics for the treatment of depression symptoms and depression. **Method.** A meta-review of systematic reviews was conducted across various databases (Medline/PubMed, Web of Science, Scopus, Cinahl, and PsycInfo). Formulation of a research question and a comprehensive search strategy employing keywords and Boolean operators guided the identification of systematic reviews reporting quantitative synthesis, particularly meta-analysis of randomized controlled trials (RCT). Systematic reviews meeting these criteria were selected, and relevant findings were systematically extracted. **Results.** Thirteen systematic reviews with meta-analyses of RCT were selected. The evidence points towards the efficacy of prebiotics, probiotics, and symbiotics in depression treatment, albeit with a weak effect. Conditions optimizing the antidepressant efficacy of these supplements were identified, including their use as adjunctive therapy to pharmacological treatment, concurrent use of probiotics and prebiotics (or symbiotics), and the use of multi-strain formulations. **Discussion and conclusion.** Prebiotics, probiotics, and symbiotics are considered to demonstrate substantive evidence of their efficacy in the treatment of depression. Nevertheless, various research opportunities within this field have been identified.

Keywords: depression, probiotics, prebiotics, symbiotics, meta-analysis, psychological tests.

RESUMEN

Antecedentes. Investigaciones recientes han puesto de manifiesto la importancia de cuidar y fortalecer la microbiota intestinal debido a su relación con la salud mental, pudiendo tener implicaciones en la prevención y manejo de enfermedades como la depresión. Una oportunidad para lograr esto es la suplementación con microorganismos vivos llamados probióticos, el uso de sustancias que promueven su desarrollo (prebióticos) o ambos (simbióticos). **Objetivo.** Explorar la literatura existente sobre la eficacia de probióticos, prebióticos y simbióticos para el tratamiento de la sintomatología depresiva y de la depresión. **Método.** Se realizó una meta-revisión sistemática en diferentes bases de datos (*Medline/PubMed, Web of Science, Scopus, Cinahl, and PsycInfo*). Se formuló una pregunta de investigación y estrategia de búsqueda en estas bases de datos, utilizando palabras clave y operadores booleanos. Se seleccionaron las revisiones sistemáticas que reportaron síntesis cuantitativa como metaanálisis de ensayos controlados aleatorizados (ECA) y se extrajeron los hallazgos obtenidos en los mismos. **Resultados.** Se seleccionaron 13 revisiones sistemáticas con metaanálisis de ECA en las cuales se identificó evidencia de la eficacia de prebióticos, probióticos y simbióticos en el tratamiento de depresión, aunque con un efecto débil. Se reportaron algunas condiciones que pueden optimizar la eficacia antidepresiva de estos suplementos como: uso como terapia adjunta al tratamiento farmacológico, uso conjunto de probióticos y prebióticos (simbióticos) y uso de formulaciones multicepas. **Discusión y conclusión.** Se concluyó que los prebióticos, probióticos y simbióticos muestran evidencia de su eficacia en el tratamiento de la depresión, identificando varias oportunidades de investigación en este campo.

Palabras clave: depresión, probiótico, prebiótico, simbiótico, metaanálisis, pruebas psicológicas.

BACKGROUND

Although often overlooked or misinterpreted as mere sadness, depression is a multifaceted condition that manifests itself in various ways, affecting not only mood but also the physical health and daily functioning of afflicted individuals (Organización Panamericana de la Salud [OPS], 2017). Depression is not just a temporary state of sadness; it constitutes a persistent condition plunging those affected into a profound emotional abyss. It is often accompanied by feelings of hopelessness, loss of interest in previously pleasant activities, constant fatigue, difficulty concentrating, loss of appetite, disrupted sleep patterns, cognitive impairment, and feelings of worthlessness or guilt (American Psychiatric Association, 2016).

According to data provided by WHO in 2015, the prevalence of depression increased by 18.4% over ten years from 2005 to 2015. Current estimates suggest that nearly 322 million individuals worldwide suffer from depression. Its incidence is more pronounced among women than men, with a percentage difference of 1.5 %. Furthermore, depression manifests across all age groups, with a higher prevalence among women ages between 55 and 74 (OPS, 2017).

Treatment of depression includes psychotherapy and pharmacotherapy. The latter involves the use of antidepressant drugs, which work through various mechanisms of action, mainly regulating the monoaminergic system composed of the neurotransmitters serotonin (5HT), dopamine (DA), and norepinephrine (NA) (Pérez-Esparza et al., 2017). However, although this pharmacological treatment is highly effective, there is a group of patients in whom remission is not achieved, indicating the need for further investigation of alternative or adjuvant treatments.

In recent years, the importance of the intestinal bacterial flora (microbiota) in both physical and mental health has been identified, finding that disruptions to this flora may be associated with various chronic diseases, including mental health disorders such as depression and anxiety (Hou et al., 2022; Kumar et al., 2023). Moreover, a spectrum of intrinsic factors linked to the host can compromise the integrity of the intestinal bacterial flora, which can lead to dysbiosis. Some of these factors are genetic factors, chronic or infectious diseases, lifestyle habits such as unhealthy dietary patterns (unbalanced, high sugar content, and low fiber), and poor hygiene habits. Extrinsically, environmental factors, including exposure to xenobiotics such as drugs (particularly antibiotics), food additives, and other substances, have also been identified as contributors to *dysbiosis* (Hrncir, 2022).*dysbiosis* (Hrncir, 2022).*dysbiosis* (Hrncir, 2022). *dysbiosis* (Hrncir, 2022).

In this respect, treating depression and other mental health disorders could go beyond standard psychotherapeutic and pharmacological modalities and include therapeutic alternatives that restore and/or boost intestinal bacterial flora, such as a dietary regimen abundant in fruits, leafy green vegetables, fish, and polyphenols. Concurrently, the consumption of beneficial microorganisms, known as probiotics, of substances that promote their growth (prebiotics), or a combination of both (symbiotics), stands as a pertinent adjunct to these therapeutic strategies (Kumar et al., 2023).

Probiotics, found naturally in our digestive system and considered an essential part of the gut microbiota, may also be supplemented by specific live microorganisms that, when ingested as nutritional supplements, adapt to the intestinal environment, conferring benefits similar to naturally occurring probiotics. Conversely, prebiotics are selectively fermentable ingredients that cause specific changes in the composition and/or activity of the gastrointestinal micro-

Table 1
Searching Strategy across Various Databases

Medline (via Pubmed)
("probiotic s"[All Fields] OR "probiotical"[All Fields] OR "probiotics"[MeSH Terms] OR "probiotics"[All Fields] OR "probiotic"[All Fields] OR ("prebiotically"[All Fields] OR "prebiotics"[MeSH Terms] OR "prebiotics"[All Fields] OR "prebiotic"[All Fields])) AND ("review"[Publication Type] OR "systematic review"[Filter]) AND (("depressed"[All Fields] OR "depression"[MeSH Terms] OR "depression"[All Fields] OR "depressions"[All Fields] OR "depression s"[All Fields] OR "Depressive disorder"[MeSH Terms] OR ("depressive"[All Fields] AND "disorder"[All Fields]) OR "Depressive disorder"[All Fields] OR "depressivity"[All Fields] OR "depressive"[All Fields] OR "depressively"[All Fields] OR "depressiveness"[All Fields] OR "depressives"[All Fields] OR "Depressive Symptoms"[All Fields] OR "Depressive Symptom"[All Fields] OR "Depressive disorder"[All Fields] OR "Depressive syndrome"[All Fields] OR "Depressive syndromes"[All Fields]) AND ("review"[Publication Type] OR "systematic review"[Filter])) AND (("systematic review"[Title/Abstract] OR "systematic reviews"[Title/Abstract]))

Web of Science (Clarivate)
((ALL=(Probiotics OR Prebiotics)) AND ALL=((Depression OR "Depressive Symptoms" OR "Depressive Symptom" OR "Depressive disorder" OR "Depressive syndrome" OR "Depressive syndromes"))) AND AB=(("systematic review" OR "systematic reviews"))

Scopus
(TITLE-ABS-KEY (probiotics OR prebiotics)) AND (TITLE-ABS-KEY (depression OR "Depressive Symptoms" OR "Depressive Symptom" OR "Depressive disorder" OR "Depressive syndrome" OR "Depressive syndromes")) AND (TITLE-ABS-KEY ("systematic review" OR "systematic reviews"))

Cinahl (via Ebsco)
TX (probiotics or prebiotics) AND TX (Depression OR "Depressive Symptoms" OR "Depressive Symptom" OR "Depressive disorder" OR "Depressive syndrome" OR "Depressive syndromes") AND AB ("systematic review" OR "systematic reviews")

PsycInfo (via Ovid)
((Probiotics or Prebiotics) and (Depression or "Depressive Symptoms" or "Depressive Symptom" or "Depressive disorder" or "Depressive syndrome" or "Depressive syndromes")).af. and ("systematic review" or "systematic reviews").md.

biota (Sarkar et al., 2016). Finally, symbiotics are selective formulations of probiotics and prebiotics.

The mechanism of action of probiotics is an extraordinary process owing to their multifaceted beneficial effects. These encompass the establishment of eubiosis within the intestinal microbiota, helping the host metabolism through immune system stimulation, inflammation regulation, and the production of metabolites, including short-chain fatty acids and neurotransmitters (Sikorska et al., 2023). A specific category within probiotics is psychobiotics, live microorganisms affording health benefits to individuals with mental illness when ingested in adequate doses. This is achieved through the production of neurotransmitters or their precursors, thereby influencing the microbiota-gut-brain axis (MGB) and modulating the hypothalamic-pituitary-adrenal (HPA) axis, consequently decreasing its activity. As such, certain probiotics may have positive effects on mood and cognitive function by modulating the gut microbiota and improving gut-brain communication (Dinan et al., 2013; Sikorska et al., 2023).

Several studies and systematic reviews have recently been published on the efficacy of probiotics, prebiotics, and/or symbiotics addressing depressive symptomatology or depression. This paper aims to present a meta-review outlining and summarizes the main findings in methodologically rigorous systematic reviews.

In regard to specific objectives, this meta-review seeks to describe the characteristics of published systematic reviews with quantitative synthesis, exploring subpopulations (classified by age group and health conditions) and treatment modalities (classified by length of treatment, monotherapy and add-on therapy), in which the effectiveness of probiotics, prebiotics, and symbiotics have been tested, to compare the efficacy between these different subpopulations and treatment modalities.

METHOD

A systematic review of systematic reviews — also known as a "meta-review" or "umbrella review" — (Aromataris et al., 2015; Smith et al., 2011) was conducted to analyze the efficacy of interventions based on probiotic, prebiotic, or symbiotic treatment for the management of depressive symptomatology and/or depression. A team comprising the six co-authors worked on the review. A review protocol was registered with the Research Registry platform and the identifying number was review registry1817 (Anguiano-Morán et al., 2024). A research question was formulated based on the identification of the components of the PICO strategy (population, intervention, comparison, and outcomes): P = healthy individuals with depressive symptomatology or diagnosed depression at various stages of evolution; I = treatment with probiotics, prebiotics, or symbiotics either as monotherapy or adjunctively to pharmacological treatment; C = administration of a placebo and/or standard pharmacological treatment; and O = evaluation of depression levels through self-reporting using psychometric depression scales. Only systematic reviews of Randomized Controlled Trials (RCT) reporting quantitative data synthesis (meta-analysis) were considered.

The research involved searches across databases such as *Medline (*via *PubMed), Web of Science, Scopus, Cinahl (*via *Ebsco), and PsycInfo (*via *Ovid)*, using keywords and Boolean operators. The specific search strategies for each database consulted are detailed in Table 1.

The Zotero bibliographic manager was used to manage the reference database and identify duplicate reviews, while the Rayyan online system was used to select studies through title and abstract by two reviewers. Inclusion criteria comprised having all the elements of the PICO strategy and publication in either English or Spanish. The full texts of the reviews selected through this process were acquired and analyzed by other two reviewers who carried out a painstaking selection considering the previous criteria, in addition to whether they included quantitative synthesis, and fulfilled certain quality considerations. A PRISMA flow diagram (Page et al., 2021) was generated to illustrate the search, screening, and article inclusion processes (Figure 1).

The quality of the selected reviews was assessed through the AMSTAR II instrument, which contains sev-

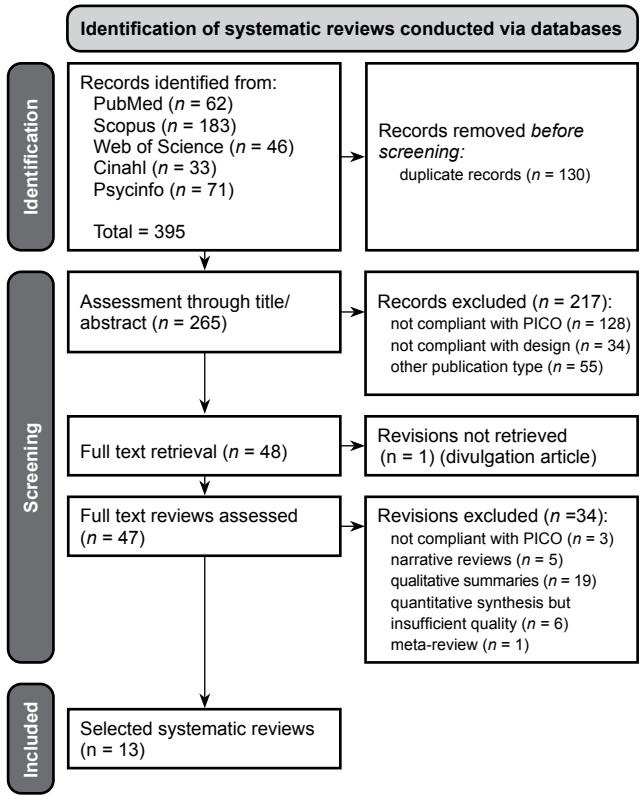

Figure 1. PRISMA Flow Diagram for the Search Process and Selection of Systematic Reviews.

en critical domains and nine non-critical domains. For each item, the answer could be "yes," "no," or "partly so." According to this instrument, overall confidence of the systematic reviews can be rated as the following: 1) "High," for no or one non-critical weakness; 2) "Moderate," for two or more non-critical weaknesses; 3) "Low," for one critical flaw with or without a non-critical weakness; and 4) "Very low," for two or more critical flaw with or without non-critical weakness (Shea et al., 2017).

Data extraction for the characteristics of the selected systematic reviews included study populations, interventions, comparators, and outcomes, participants enrolled in the studies, and the main outcomes obtained, both overall and by subgroup. Information on the heterogeneity reported as the I^2 statistic for overall and subgroup meta-analyses was also collected. According to this index, heterogeneity of effect estimates across trials can be described as small ($I^2 < 25\%$), moderate (I^2 between 26 and 74%), or substantial ($I^2 \geq 75\%$) (Higgins et al., 2003). Additionally, data on the risk of bias assessment reported in the systematic reviews was collected.

RESULTS

Flowchart

The diagram in Figure 1 shows the systematic review search and selection process. After the review process, 13 quantitative systematic reviews (meta-analyses) were selected.

Table 2
Evaluation of Quality of Selected Systematic Reviews

Systematic Review	*Items AMSTAR II*[a,b]																	*Confidence rating*[c]
	1	*2**	*3*	*4**	*5*	*6*	*7**	*8*	*9i **	*9ii **	*10*	*11i**	*11ii **	*12*	*13**	*14*	*15**	*16*	
Amirani et al., 2020	1	0	1	0.5	1	1	0	1	0.5	NA	0	1	NA	0	0	0	0	1	Very Low
Desai et al., 2021	1	1	1	1	1	1	0	1	1	NA	1	1	NA	0	1	1	0	1	Very Low
El Dib et al., 2021	1	1	1	1	1	1	0	1	1	NA	1	1	NA	0	1	1	0	1	Very Low
Goh et al., 2019	1	1	1	0.5	1	1	0	1	1	NA	0	1	NA	0.5	1	1	0	1	Low
Halemani et al., 2023	1	1	1	0.5	1	1	0	1	1	NA	0	1	NA	0	0	0	0	1	Very Low
Hofmeister et al., 2021	1	1	1	1	1	1	1	1	1	NA	0	1	NA	1	1	1	1	1	High
Huang et al., 2016	1	0	1	0.5	1	1	0	0.5	1	NA	0	1	NA	0	1	1	1	1	Low
Le Morvan et al., 2022	1	0	1	1	1	1	0	1	1	NA	1	1	NA	0	1	1	0	1	Low
Lin et al., 2023	1	1	1	1	1	1	0	1	1	NA	0	1	NA	1	1	0	1	1	Low
Liu et al., 2019	1	0	1	0.5	1	1	0	1	1	NA	0	1	NA	0	1	0	1	1	Very low
Nikolova et al., 2021	1	0	1	0.5	1	1	0	1	0.5	NA	0	1	NA	0	0	0	0	1	Very low
Zagórska et al., 2020	1	0	1	0.5	1	1	0	1	0.5	NA	0	1	NA	0	0	0	1	1	Very low
Zhu et al., 2022	1	1	1	0.5	1	1	0	0.5	1	NA	0	1	NA	1	1	1	1	1	Low

Notes:
[a]AMSTAR II instrument items: 1 = research question and inclusion criteria have PICO components (participants, intervention, comparison group, outcomes or results); 2 = review follows a previously established protocol; 3 = study design selection is justified; 4 = comprehensive literature search strategy; 5 = selection of duplicate studies; 6 = duplicate data extraction; 7 = listing and justification of excluded studies; 8 = describes included studies in detail; 9i = satisfactory technique for assessing risk of bias of RCT; 9ii = satisfactory technique for assessing risk of bias of nonrandomized interventional studies (RCT); 10 = reports sources of funding of studies included in review; 11i = if reporting meta-analyses, uses an adequate method of statistical pooling of RCT; 11ii = if reporting meta-analysis, uses an adequate statistical pooling method in RCT; 12 = assesses the impact of risk of bias on the meta-analysis; 13 = in the discussion, considers the impact of risk of bias on results; 14 = justifies and discusses any observed heterogeneity; 15 = assesses publication bias; 16 = reports conflicts of interest. Domains considered critical are shown with an asterisk (*).
[b]Evaluation of the items: no = 0; partial yes = .5; yes = 1; NA = not applicable.
[c]Rating is explained in the methods section.

Quality Analysis of Selected Systematic Reviews

Table 2 shows the quality analysis of the selected systematic reviews. Most systematic reviews had unsatisfactory results, with confidence being rated as "Low" or "Very low" and only one achieving a "High" (Hofmeister et al., 2021). In regard to the results for the critical items, some reviews did not report having a protocol registry before the review (item 2), others did not report the search strategies clearly (item 4), most failed to report the studies excluded or their justification for this (item 7), and still others did not provide a detailed discussion of the impact of the risk of bias in the selected studies on the findings (item 13), with several failing to report publication bias (item 15). The low frequency of compliance with item 7 was particularly striking; only one review reported the list of studies excluded and their justification (Hofmeister et al., 2021). Failure to comply with this item affected the overall results of the other reviews.

Characteristics of the Systematic Reviews Selected

Table 3 outlines the general characteristics and main results of the systematic reviews selected. In regard to the population of interest, these reviews included individuals with depressive symptomatology or a depressed population at various stages with or without other comorbidities. In regard to the intervention, most of the systematic reviews evaluated the efficacy of probiotics, although some also included the evaluation of prebiotics, symbiotics, and even paraprobiotics. These systematic reviews included studies using probiotics as monotherapy or adjunctive interventions to pharmacological treatment. Furthermore, the intervention encompassed both single and multiple strain therapies. Placebos or standard pharmacological treatment, whether separately or combined, were used as comparators. Depressive symptomatology was assessed using various psychometric scales.

Meta-analyses, as reported in these systematic reviews, evaluated effect size using metrics such as weighted mean difference (WMD), mean difference (MD), or standardized mean difference (SMD). Some systematic reviews opted for meta-analyses using various depression assessment scales (Amirani et al., 2020; El Dib et al., 2021) and intervention types (Liu et al., 2019), a combination of intervention types and populations (Hofmeister et al., 2021), or specific subpopulations (Desai et al., 2021). However, most systematic reviews involved an overall meta-analysis with subgroup analysis, explaining the factors influencing efficacy (Goh et al., 2019; Halemani et al., 2023; Huang et al., 2016; Le Morvan de Sequeira et al., 2022; Lin et al., 2023; Nikolova et al., 2021; Zagórska et al., 2020; Zhu et al., 2022).

Efficacy of Probiotics

The assessment of probiotic efficacy was examined across 13 selected systematic reviews, focusing on the treatment of depressive symptomatology and depression itself.

Within the healthy population, probiotic efficacy was evaluated in three reviews (Goh et al., 2019; Huang et al., 2016; Zagórska et al., 2020). Only Huang et al. (2016) demonstrated a statistically significant meta-analysis from four studies (n = 325, *SMD*: -.25; $CI_{95\%}$: -.47, -.03).

Five reviews evaluated probiotic efficacy in populations with depressive symptomatology, predominantly associated with chronic diseases (Goh et al., 2019; Hofmeister et al., 2021; Le Morvan de Sequeira et al., 2022; Lin et al., 2023; Zhu et al., 2022). Statistically significant meta-analyses were observed in three reviews: 1) Hofmeister et al. (2021) with 35 studies (n = 2,988, *SMD*: .31; $CI_{95\%}$: .15, .46); 2) Le Morvan de Sequeira et al., (2022) with 11 studies (n = 830, *SMD*: -.30; $CI_{95\%}$: -.51, -.09); and 3) and Lin et al. (2023) with eight studies (n = 412, *SMD*: -2.00; $CI_{95\%}$: -3.41, -.59).

Eight systematic reviews found statistical significance in populations diagnosed with varying stages of depression that involved probiotic treatment as monotherapy or as an adjunct intervention to pharmacological treatment (Amirani et al., 2020; El Dib et al., 2021; Hofmeister et al., 2021; Le Morvan de Sequeira et al., 2022; Liu et al., 2019; Nikolova et al., 2021; Zagórska et al., 2020; Zhu et al., 2022). Some of the most outstanding reviews, such as Hofmeister et al. (2021) with nine studies (n = 544, *SMD*: .78; $CI_{95\%}$: .19, 1.37); Zhu et al. (2022) with ten studies (n = 541, *SMD*: .46; $CI_{95\%}$: .22, .70); and Liu et al. with 25 studies (*SMD*: -.24; $CI_{95\%}$: -.36, -.12), had substantial sample sizes. Two reviews evaluated probiotic efficacy in monotherapy (Lin et al., 2023; Nikolova et al., 2021) yet reported no statistically significant differences compared to the placebo in their meta-analyses.

In the population with major depressive disorder (MDD), probiotic efficacy was evaluated through a subgroup analysis as part of a systematic review (Goh et al., 2019) including three studies, and was statistically significant (n = 144, *SMD*: -.75; $CI_{95\%}$: -1.09, -.41). Another review (Huang et al., 2016) included one study focusing on this population, which was statistically significant (n = 40, *SMD*: -.73; $CI_{95\%}$: -1.37, -.09).

Regarding the analysis of probiotic efficacy across various age categories, four reviews implemented subgroup analyses within their meta-analyses (Amirani et al., 2020; Huang et al., 2016; Lin et al., 2023; Zhu et al., 2022). Two reviews established 40 years as the threshold, creating two age groups (< 40 years and ≥ 40 years): 1) Amirani et al. (2020) included studies involving patients with depression and found statistically significant evidence in both age groups, while 2) Lin et al. (2023)included patients with depressive symptomatology and depression, only finding statistically significant evidence in the ≥ 40 years old

Table 3
Summary of Selected Systematic reviews with meta-analysis

Selected systematic review	*Population(s)*[a,b]	*Intervention(s)*[c]	*Comparator(s)*	*Instrument used*	*Results of meta-analyses of RCT*
Amirani et al., 2020	Population with moderate to major depression (MDD) (*n* = 180)	Probiotics or Symbiotics (Monotherapy or Therapy in addition to active treatment with pharmacotherapy and/or psychotherapy) Probiotic (genera): Lactobacillus Bifidobacterium Duration: six to 12 weeks	Placebo Active treatment (pharmacological or psychotherapy) Placebo + Active treatment	HAMD BDI	**HAMD:** Overall analysis: meta-analysis of four studies (*n* = 180; Con:90; Int:90) was significant (*WMD*: -9.60; CI_{95}: -10.8, -9.11). I^2 = 99.7% Subgroup analysis by age. Age < 40 years: Meta-analysis of two studies was significant (*WMD*: -1.69; CI_{95}: -2.37, -1.02). I^2 = 81.0% Age ≥ 40 years: meta-analysis of two studies was significant (*WMD*: -18.10; CI_{95}: -18.80, -17.41). I^2 = 98.8% **BDI:** Overall analysis: meta-analysis of three studies (*n* = 154; Con:76; Int:78) was not statistically significant (*WMD*: -11.17; CI_{95}: -24.99, 2.65). I^2 = 99.1%
Desai et al., 2021	Pregnant women and postpartum (perinatal) (*n* = 545)	Probiotics Probiotic (genera): Lactobacillus Bifidobacterium Duration: prenatal: 12-36 weeks; postnatal: up to 24 weeks postpartum	Placebo	EPDS	**EPDS:** Meta-analysis of 2 studies (*n* = 545; Con:263; Int:282) was not significant (*MD*: -.46; CI_{95}: -2.16, 1.25). I^2 = 74.0%
El Dib et al., 2021	Population with depression (with or without other morbidities) (*n* = 375)	Probiotics or Symbiotics (Monotherapy or Therapy in addition to active treatment with pharmacotherapy and/or psychotherapy) Probiotic (genera): Lactobacillus Bifidobacterium Bacillus coagulans Clostridium butyricum Enterococcus faecalis Duration: three to 24 weeks	Placebo Active treatment (pharmacological or psychotherapy) Placebo + Active treatment	BDI DASS-Depression MADRS	**BDI:** Meta-analysis of three studies (*n* = 156; Con:127; Int:129) was significant (*MD*: -3.20; CI_{95}: -5.91, -.49). I^2 = 21% **DASS**: Meta-analysis of two studies (*n* = 221; Con:110; Int:111) was not significant (*MD*: 2.01; CI_{95}: -.80, 4.82). I^2 = 0% **MADRS:** Meta-analysis of two studies (*n* = 119; Con:59; Int:60) was not significant (*MD*: -2.41, CI_{95}: -10.55, 5.72). I^2 = 87%

Table 3
Summary of Selected Systematic reviews with meta-analysis (continued)

Selected systematic review	*Population(s)*[a,b]	*Intervention(s)*[c]	*Comparator(s)*	*Instrument used*	*Results of meta-analyses of RCT*
Goh et al., 2019	Healthy population (*n* = 1,035) Population with various clinical diagnoses (T2D, IBS, CVD, fibromyalgia). (*n* = 722) Population with MDD (*n* = 144)	Probiotics or Symbiotics (Monotherapy or Therapy in addition to active treatment with pharmacotherapy and/or psychotherapy) Probiotics (genera): Lactobacillus Bifidobacterium S. thermophilus Conventional Yogurt Duration: four to 24 weeks	Placebo Active treatment (pharmacological or psychotherapy) Placebo + Active treatment	Diverse scales assessing depressive symptoms	**Various scales of depressive symptoms:** *Overall analysis:* meta-analysis of 24 studies (*n* = 1,901; Con:871; Int:1,030) was significant (*SMD*: -.31; CI_{95}: -.56, -.07). I^2 = 82% *Subgroup analysis by type of population* MDD: Meta-analysis of three studies (*n* = 144; Con:76, Int:68) was significant (*SMD*: -.75; CI_{95}: -1.09, -.41). I^2 = 0% Population with other clinical diagnoses: Meta-analysis of seven studies (*n* = 722, Con:357, Int:365) was not significant (*SMD*: -.26; CI_{95}: -.70, .17). I^2 = 84% Healthy population: Meta-analysis of 14 studies (*n* = 1,035; Con:438; Int:597) was not significant (*SMD*: -.25; CI_{95}: -.60, .11). I^2 = 82% *Subgroup analysis by type of intervention:* Only one strain: Meta-analysis of 11 studies (*n* = 1,070; Con:469; Int:601) was not significant (*SMD*: -.01; CI_{95}: -.30, .27). I^2 = 71% Multiple strains: Meta-analysis of 13 studies (*n* = 831; Con:402; Int:429) was significant (*SMD*: -.57; CI_{95}: -.96, -.18). I^2 = 85%
Halemani et al., 2023	Pregnant women before delivery (prenatal) (*n* = 298) Women after delivery (postnatal) (*n* = 518)	Probiotics (genera): Lactobacillus Bifidobacterium S. thermophilus	Placebo	Diverse scales assessing depressive symptoms	**Various scales of depressive symptoms:** *Overall analysis:* meta-analysis of four studies (*n* = 816; Con:414; Int:402) was not significant (*SMD*: -.10; CI_{95}: -.29, .09). I^2 = 43% *Subgroup analysis by perinatal period* Prenatal: Meta-analysis of two studies (*n* = 298; Con:155, Int:143) not significant (*SMD*: -.05; CI_{95}: -.24, .35). I^2 = 40% Postnatal: Meta-analysis of two studies (*n* = 518, Con:259, Int:259) was significant (*SMD*: -.22; CI_{95}: -.40, -.05). I^2 = 0%
Hofmeister et al., 2021	Population with no depression (*n* = 3,417) Population suffering from depression (*n* = 817)	Probiotics Prebiotics Symbiotics Paraprobiotics Fecal microbiota transplant (Monotherapy or therapy in addition to active treatment with pharmacotherapy and/or psychotherapy) Probiotics (genera): Lactobacillus, Bifidobacterium, Bacillus, Clostridium, Lactococcus, Streptococcus, Weisella Duration: four - 52 weeks	Placebo	Diverse scales assessing depressive symptoms	**Various scales of depressive symptoms:** *Probiotics in people without depression:* meta-analysis of 35 studies (*n* = 2,988; Con:1,569; Int: 1419) was significant (*SMD*: .31; CI_{95}: .15, .46). I^2 = 74.4% *Probiotics in people with depression:* Meta-analysis of nine studies (*n* = 544; Con:271; Int:273) was significant (*SMD*: .78; CI_{95}: .19, 1.37). I^2 = 89.9% *Prebiotics in people without depression:* Meta-analysis of two studies (*n* = 184; Con:92; Int:92) was not significant (*SMD*: .13; CI_{95}: -.23, .48). I^2 = .0% *Prebiotics in people with depression:* Meta-analysis of three studies (*n* = 122; Con:68; Int:54) was significant (*SMD*: .39; CI_{95}: .04, .73). I^2 = 26.6% *Symbiotics in people without depression:* Meta-analysis of six studies (*n* = 307; Con:156; Int:151) was significant (*SMD*: .68; CI_{95}: .36, 1.00). I^2 = 44.0% *Symbiotics in people with depression*: One study (*n* = 40; Con:20; Int:20) was **not** significant (*SMD*: .63; CI_{95}: 00, 1.27). *Paraprobiotics:* One study was not significant. *Fecal transplant in people without depression*: One study (*n* = 49; Con:23; Int:26) **not** significant (*SMD*: -.16; CI_{95}: -.72, .40)

Table 3
Summary of Selected Systematic reviews with meta-analysis (continued)

Selected systematic review	*Population(s)*[a,b]	*Intervention(s)*[c]	*Comparator(s)*	*Instrument used*	*Results of meta-analyses of RCT*
Huang et al., 2016	Healthy population (*n* = 325) Population with MDD (*n* = 40)	Probiotics or Symbiotics (Monotherapy or Therapy in addition to active treatment with pharmacotherapy and/or psychotherapy) Probiotic (genera): Lactobacillus Bifidobacterium Lactococcus S thermophilus,	Placebo Active treatment (pharmacological or psychotherapy) Placebo + Active treatment Placebo	Diverse scales assessing depressive symptoms	**Various scales of depressive symptoms:** *Overall analysis*: meta-analysis of five studies (*n* = 365, Con: 182, Int: 183) was significant (*SMD*: -.30; CI_{95}: -.51, -.09). I^2 = 0% *Subgroup analysis by age group:* Under 60: Meta-analysis of four studies (*n* = 180) was significant (*SMD*: -.43; CI_{95}: -.72, -.13). I^2 = 0% Over 65: 1 study (*n* = 185) was not significant (*SMD*: -.18; CI_{95}: -.47, .11). I^2 = Not applicable *Subgroup analysis by health level:* Healthy: *meta*-analysis of four studies (*n* = 325) was significant (*SMD*: -.25; CI_{95}: -.47, -.03). I^2 = 0% MDD: 1 study (*n* = 40) was significant (*SMD*: -.73; CI_{95}: -1.37, -.09). I^2 = Not applicable
Le Morvan de Sequeira et al., 2022	No diagnosis of depression (healthy or with other morbidities such as T2D, insomnia, fibromyalgia, obesity, stress) ("Healthy"). (*n* = 830) Population with diagnosed depressive disorder (*n* = 262)	Probiotics or Symbiotics (Monotherapy or Therapy in addition to active treatment with pharmacotherapy and/or psychotherapy) Probiotic (genera): Lactobacillus Bifidobacterium Duration: four-24 weeks	Placebo Active treatment (pharmacological or psychotherapy) Placebo + Active treatment	Various scales assessing depressive symptoms	**Various scales of depressive symptoms:** Overall analysis: meta-analysis of 15 studies (*n* = 1,092; Con:541; Int:551) was significant (*SMD*: -.37; CI_{95}: -.55, -.20). I^2 = 48% *Subgroup analysis by treatment duration* 4-8 weeks: Meta-analysis of nine studies (*n* = 475) was significant (*SMD*: -.40; CI_{95}: -.64, -.16). I^2 = 39% 9-24 weeks: Meta-analysis of six studies (*n* = 617) was significant (*SMD*: -.34; CI_{95}: -.61, -.07). I^2 = 59% *Subgroup analysis by type of intervention* Single Strain: Meta-analysis of seven studies (*n* = 653) was significant (*SMD*: -.32; CI_{95}: -.61, -.03). I^2 = 66% Multi-strain: Meta-analysis of eight studies (*n* = 439) was significant (*SMD*: -.43; CI_{95}: -.62, -.23). I^2 = 4% *Subgroup analysis by type of population* No diagnosis of depression, healthy or with other morbidities ("Healthy"): Meta-analysis of eleven studies (*n* = 830) was significant (*SMD*: -.30; CI_{95}: -.51, -.09). I^2 = 51% Population with diagnosed depressive disorder: Meta-analysis of four studies (*n* = 262) was significant (*SMD*: -.58; CI_{95}: -.82, -.33). I^2 = 0% *Subgroup analysis by depression scale* BDI: Meta-analysis of 11 studies (*n* = 649) was significant (*SMD*: -.41; CI_{95}: -.59, -.23). I^2 = 25% HADS-D: Meta-analysis of three studies (*n* = 364) was not significant (*SMD*: -.19; CI_{95}: -.57, .19). I^2 = 58% HAM-D: Meta-analysis of three studies (*n* = 206) was not significant (*SMD*: -.30; CI_{95}: -.74, .14). I^2 = 60%

Table 3
Summary of Selected Systematic reviews with meta-analysis (continued)

Selected systematic review	*Population(s)*[a,b]	*Intervention(s)*[c]	*Comparator(s)*	*Instrument used*	*Results of meta-analyses of RCT*
Lin et al., 2023	Population with depression (basic psychiatric symptoms) (*n* = 364) Population with depressive symptoms related to other diseases (MS, T2D/CVD, fibromyalgia, PCOS, MI). (*n* = 412)	Probiotics (monotherapy) Probiotics (genera): Bacillus Lactobacillus Bifidobacterium Lactococcus Streptococcus termophilus C. butyricum	Placebo	IBC / BDI-II DASS-21	**BDI:** *Overall analysis:* Meta-analysis of 13 studies (*n* = 776; Con:379, Int: 397) was significant (*MD*: -1.98; CI_{95}: -3.14, -.82). I^2 = 76% *Subgroup analysis by age* Age < 40 years: Meta-analysis of 6 studies (*n* = 402) was not significant (*MD*: -.40; CI_{95}: -1.52, .71). I^2 = 30% Age ≥ 40 years: Meta-analysis of 7 studies (*n* = 374) was significant (*MD*: -2.80; CI_{95}: -4.17, -1.43). I^2 = 59% *Subgroup analysis by treatment duration* ≤ 8 weeks: Meta-analysis of 6 studies (*n* = 376) was significant (*MD*: -3.28; CI_{95}: -5.55, -1.00). I^2 = 57% > 8 weeks: Meta-analysis of 7 studies (*n* = 400) was significant (*MD*: -1.20; CI_{95}: -2.35, -.05). I^2 = 74% *Subgroup analysis by type of population* Depression (basic psychiatric symptoms): Meta-analysis of 5 studies (*n* = 364) was not significant (*MD*: -1.66; CI_{95}: -3.33, .02). I^2 = 0% Depressive symptoms related to other illnesses: Meta-analysis of 8 studies (*n* = 412) was significant (*MD*: -2.00; CI_{95}: -3.41, -.59). I^2 = 85%
Liu et al., 2019	Population suffering from depression	Prebiotics, Probiotics or Symbiotics (Monotherapy or Therapy in addition to active treatment with pharmacotherapy and/or psychotherapy). Probiotic (genera) Bifidobacterium Bacillus Duration: eight days to 45 weeks	Placebo Active treatment (pharmacological or psychotherapy) Placebo + Active treatment	Diverse scales assessing depressive symptoms	**Various scales of depressive symptoms:** *Prebiotics - Overall analysis* Meta-analysis of five studies was not significant (*SMD*: -.08; CI_{95}: -.30, .51). I^2 = Not reported *Probiotics - Overall analysis* Meta-analysis of 25 studies was significant (*SMD*: -.24; CI_{95}: -.36, -.12). I^2 = 48.2%
Nikolova et al., 2021	Population with moderate to major depression (MDD) (*n* = 404)	Probiotic or Symbiotic (Monotherapy or Therapy in addition to active treatment with pharmacotherapy and/or psychotherapy). Probiotic (genera): Lactobacillus Bifidobacterium C. butyricum Duration: 8 weeks	Placebo Active treatment	Diverse scales assessing depressive symptoms	**Various scales of depressive symptoms:** *Overall analysis*: meta-analysis of 7 studies (*n* = 404; Con:202, Int: 202) was significant (*SMD*: .58; CI_{95}: .19, .97). I^2 = 73 % *Subgroup analysis by type of intervention:* Add-on therapy to pharmacotherapy: Meta-analysis of 5 studies (*n* = 254) was significant (*SMD*: .83; CI_{95}: .49, 1.17). I^2 = 40 % Monotherapy**:** Meta-analysis of 2 studies (*n* = 150) was not significant (*SMD*: -.02; CI_{95}: -.34, .30). I^2 = 0 %

Table 3
Summary of Selected Systematic reviews with meta-analysis (continued)

Selected systematic review	*Population(s)*[a,b]	*Intervention(s)*[c]	*Comparator(s)*	*Instrument used*	*Results of meta-analyses of RCT*
Zagórska et al., 2020	Healthy population Population suffering from depression	Probiotic or Symbiotic (Monotherapy or Therapy in addition to active treatment with pharmacotherapy and/or psychotherapy). Probiotic (genera): Lactobacilus Bifidobacterium	Placebo Active treatment (pharmacological or psychotherapy) Placebo + Active treatment	Diverse scales assessing depressive symptoms	**Various scales of depressive symptoms:** *Overall analysis:* meta-analysis of 16 studies was significant (*SMD*: -.35; CI_{95}: -.59, -.12). I^2 = 79 % *Subgroup analysis by health level:* Healthy: Meta-analysis of 11 studies was not significant (*SMD*: -.16; CI_{95}: -.34, .02). I^2 = 56 % Depressed: Meta-analysis of five studies was significant (*SMD*: -.87; CI_{95}: -1.66, -.09). I^2 = 90 %
Zhu et al., 2022	Population without depression (with or without other morbidities) (*n* = 804) Population suffering from depression (*n* = 541)	Probiotic or Symbiotic (Monotherapy or Therapy in addition to active treatment with pharmacotherapy and/or psychotherapy). Probiotic (genera): Lactobacilus Bifidobacterium Weisella cibaria	Placebo Active treatment (pharmacological or psychotherapy) Placebo + Active treatment	Diverse scales assessing depressive symptoms	**Various scales of depressive symptoms:** *Overall analysis*: meta-analysis of 19 studies (*n* = 1,345) was significant (*SMD*:0.19; CI_{95}: .01, .37). I^2 = 59.67 % *Subgroup analysis by health level:* Without depression (healthy or other morbidities): meta-analysis of nine studies (*n* = 804) was not significant (*SMD*: -.10; CI_{95}: -.23, .02). I^2 = 0 % With depression: Meta-analysis of 10 studies (*n* = 541) was significant (*SMD*: .46; CI_{95}: .22, .70). I^2 = 47.33 % *Subgroup analysis by age* Age < 60 years: Meta-analysis of 12 studies (*n* = 827) was significant (*SMD*: .36; CI_{95}: .14, .58). I^2 = 57.51 % Age ≥ 60 years: Meta-analysis of seven studies (*n* = 518) was not significant (*SMD*: -.13; CI_{95}: -.31, .04). I^2 = 0 % *Subgroup analysis by duration of treatment (Tx).* < 8 weeks: Meta-analysis of nine studies (*n* = 519) was significant (*SMD*: .30; CI_{95}: .12, .47). I^2 = 27.62 % < 8 weeks: Meta-analysis of 10 studies (*n* = 826) was not significant (*SMD*: .08; CI_{95}: -.20, .35). I^2 = 67.65 % *Subgroup analysis by type of treatment (Tx).* Single-strain: Meta-analysis of 10 studies (*n* = 671) not significant (*SMD*: .18; CI_{95}: -.19, .55). I^2 = 78.79 % Multi-strain: Meta-analysis of nine studies (*n* = 674) was significant (*SMD*: .17; CI_{95}: .01, .32). I^2 = 0 %

Notes:
[a]Population included in meta-analyses evaluating the efficacy of probiotics (or prebiotics, symbiotics, etc.) in the management of depression
[b]Disease/diagnosis acronyms: MDD: major depressive disorder; IBS: irritable bowel syndrome; IBS: irritable bowel syndrome; T2D: Type 2 diabetes; CVD: cardiovascular disease; MS: multiple sclerosis; PCOS: polycystic ovary syndrome; MI: myocardial infarction
[c]The active treatment with pharmacotherapy by the participants included various pharmacological groups
[d]Treatment with probiotics could use one or more species and strains
acronyms of psychometric scales to assess depressive symptomatology: BDI: Beck Depression Inventory; HAM-D Hamilton Depression Scale; MADRS: Montgomery-Asberg Depression Rating Scale; DASS: Depression, Anxiety and Stress Scale. Other psychometric scales to assess depressive symptoms that were used in the selected systematic reviews are: HADS: Hospital Anxiety and Depression Scale; SDS: Self-rating Depression Scale, EPDS: Edinburgh Postnatal Depression Scale, among others
[e]Meta-analyses reported evaluating the efficacy of probiotics (or prebiotics, symbiotics, etc.) in the management of depression
[f]Acronyms of aspects to describe results: RCT: Randomized Controlled Trials; *MD*: mean difference; *WMD*: weighted mean difference; *SMD*: standardized mean difference; Con: participants in control group; Int: participants in intervention group; CI_{95}: confidence interval (95%)

age group. The remaining two reviews (Huang et al., 2016 and Zhu et al., 2022) established 60 years as the threshold, creating two age groups (< 60 years and ≥ 60 years). both reviews only found statistically significant evidence in the age group of 60 years old.

Additional subgroup analyses considered factors that could influence probiotic treatment efficacy, including the number of strains in the formulation and treatment duration. Regarding the number of strains, three reviews categorized two treatment types: one strain and two or more strains (multi-strain) (Goh et al., 2019; Le Morvan de Sequeira et al., 2022; Zhu et al., 2022). Statistically significant evidence for one-strain treatment was found in Le Morvan de Sequeira et al., 2022, while all three reviews reported statistically significant evidence for multi-strain treatment.

Three reviews analyzed treatment duration (Le Morvan de Sequeira et al., 2022; Lin et al., 2023; Zhu et al., 2022) and established an eight-week threshold, creating two groups with different durations (< 8 weeks and ≥ 8 weeks). while each review found statistically significant evidence for the < 8-week duration group, only two reported statistically significant evidence for the ≥ 8-week duration group (Le Morvan de Sequeira et al., 2022; Lin et al., 2023).

Two reviews evaluated probiotic efficiency in pregnant women with perinatal depressive symptomatology or depression (Desai et al., 2021; Halemani et al., 2023). Desai et al. (2021)collectively evaluated probiotic efficacy in perinatal depression (prenatal and postnatal), with no statistically significant differences being found from the comparison group. However, Halemani et al. (2023) found no statistically significant evidence in a subgroup analysis of two prenatal studies although they did find statistically significant evidence in two postnatal studies (n = 518, *SMD*: -.22; $CI_{95\%}$: -.40, -.05).

Efficacy of Prebiotics

Prebiotic efficacy was assessed in two reviews (Hofmeister et al., 2021; Liu et al., 2019). Liu's review found no evidence of statistically significant efficacy, whereas Hofmeister found evidence of probiotic efficacy in individuals with depression in a meta-analysis of three studies (n = 122, *SMD*: .39; $CI_{95\%}$: 04, .73).

Efficacy of Symbiotics

The efficacy of symbiotics has only formally been evaluated by Hofmeister et al., 2021. This review reported evidence of statistically significant efficacy in individuals without depression through a meta-analysis of six studies (n = 307, *SMD*: .68; $CI_{95\%}$: .36, 1.00).

Efficacy of Paraprobiotics

One systematic review formally evaluated the efficacy of paraprobiotics (Hofmeister et al., 2021). However, the authors only included one study that reported no evidence of statistically significant efficacy.

Risk of Bias and Heterogeneity assessments

Table 4 summarizes information on the population included in the studies of the selected systematic reviews, the number of studies included, the risk of bias assessment, as well as the heterogeneity assessment (I^2) for the reported overall meta-analyses, as well as the actions undertaken to reduce this heterogeneity.

Concerning the risk of bias analysis, the vast majority of reviews (11) reported the results in detail, only two reviews did not (Amirani et al., 2020; Zagórska et al., 2020). The majority (10) of these 11 reviews that did present the details of the analysis reported at least one study that was evaluated as having a "high risk of bias" in one of the evaluation categories. The evaluation category in which the highest frequency of evaluations with "high risk of bias" was usually reported was "Incomplete outcome data" (attrition bias).

In regard to the evaluation of heterogeneity, out of a total of 20 overall meta-analyses reported in the 13 selected systematic reviews, three (15%) overall meta-analyses reported "low" heterogeneity, eight (40%) overall meta-analyses reported "Moderate" heterogeneity, and seven (35%) overall meta-analyses reported "Substantial" heterogeneity. This high frequency of substantial heterogeneity could be because most of the reviews included studies with populations of different groups (with a variety of age categories and health conditions such as healthy, diagnosed with chronic diseases and varying levels of depression). They also included different treatment modalities (prebiotic, probiotic or symbiotic, of various durations, single-strain/multi-strain, monotherapy/add-on therapy). Most reviews performed subgroup analyses that may have decreased the overall heterogeneity, as shown in the I^2 reported for subgroup meta-analyses (Table 3). In addition, some studies performed sensitivity analyses to exclude studies that could affect heterogeneity or had a risk of bias issues.

DISCUSSION AND CONCLUSION

The present meta-review offers a comprehensive overview of systematic reviews investigating the efficacy of probiotics, prebiotics, and symbiotics to improve depressive symptoms across diverse depression levels and age groups. It is the first meta-review to synthesize key findings from recent systematic reviews of this issue.

Table 4
Summary of Risk of Bias and Heterogeneity Assessments in Selected Systematic Reviews

Systematic review	*Population for each overall meta-analysis*[a]	*n*[b]	*RoB tool*[c]	*Notes regarding RoB assessment*[d]	*n*[e]	*Overall heterogeneity (I^2)*	*Heterogeneity classification*[f]	*Actions taken to reduce heterogeneity*
Amirani et al., 2020	Depression/HAMD Depression/BDI	7	Cochrane (for RCT)	Does not report the results of the risk of bias assessment	4 3	99.7 % 99.1 %	Substantial Substantial	No subgroup meta-analysis was reported No sensitivity analysis was reported
Desai et al., 2021	Pregnant women	2	Cochrane (for RCT)	One study (50%) was reported having one high risk of bias classified as "Other bias"	2	74.0 %	Moderate	A small number of studies were included to perform a subgroup meta-analysis No sensitivity analysis was reported
El Dib et al., 2021	Depression/BDI Depression/DASS-D Depression/MADRS	5	Cochrane (for RCT)	Three studies (60 %) had at least one "definitely high risk" in the "Incomplete outcome data"	3 2 2	21 % 0 % 87 %	Small Small Substantial	Nor subgroup meta-analysis was reported A sensitivity analysis was reported
Goh et al., 2019	Healthy/CC/ Depression	24	Cochrane (for RCT)	Six studies (32%) were reported as having one high risk of bias classified as "Other bias"	24	82 %	Substantial	Subgroups analysis by clinical condition (healthy, major depressive disorder, and other clinical diagnosis) A sensitivity analysis was reported
Halemani et al., 2023	Pregnant women	4	Cochrane (for RCT)	One study (33 %) was reported with a high risk of bias ("Selection of the reported result")	4	43 %	Moderate	Subgroups analysis by clinical condition (prenatal or postnatal) No sensitivity analysis was reported
Hofmeister et al., 2021	No depression/ Probiotics Depression/ Probiotics No depression/ Prebiotics Depression/ Prebiotics No depression / Symbiotics Depression/ Symbiotics	56	Cochrane (for RCT)	24 studies (~43 %) were classified as High risk in the Overall risk of bias assessment. The most frequent category in them was "Bias from missing outcome data"	35 9 2 3 6 1	74.4 % 89.9 % 0.0 % 26.6 % 44.0 % --	Substantial Substantial Small Moderate Moderate	It does not perform subgroup analysis A sensitivity analysis was performed
Huang et al., 2016	Healthy/Depression	5	Cochrane (for RCT)	No study had a high risk of bias evaluation in the different categories.	5	0 %	Small	Subgroups analysis by age group (under 60, over 65 years), and health status (with/without depression) A sensitivity analysis was reported
Le Morvan et al., 2022	Healthy/Depression	15	Cochrane (for RCT)	Six studies (46%) had one high risk of bias (four studies in "Deviations from the intended interventions" and two studies in "Missing outcome data")	15	48 %	Moderate	Subgroups analysis by treatment duration (4-8 weeks and 9-24 weeks), type of treatment (single strain or multi-strain), type of population (with/ without depression), and depression scale (BDI, HADS-D, HAM-D) No sensitivity analysis was reported

Table 4
Summary of Risk of Bias and Heterogeneity Assessments in Selected Systematic Reviews (continued)

Systematic review	*Population for each overall meta-analysis*[a]	*n*[b]	*RoB tool*[c]	*Notes regarding RoB assessment*[d]	*n*[e]	*Overall heterogeneity (I^2)*	*Heterogeneity classification*[f]	*Actions taken to reduce heterogeneity*
Lin et al., 2023	Depression / DS	13	Cochrane (for RCT)	Two studies (15 %) had one high risk of bias ("Incomplete outcome data" and "selective reporting study, each)	13	76 %	Substantial	Subgroup analysis by age (< 40, ≥ 40), treatment duration (≤ 8 and > 8 weeks), and population (with/without depression). A sensitivity analysis was reported
Liu et al., 2019	Depression/ Prebiotics Depression/ Probiotics	30	Cochrane (for RCT)	40 % of studies were reported as having one high risk of bias ("Incomplete outcome data")	5 25	(Not reported) 42.8 %	--- Moderate	It does not report subgroup analysis Reports a sensitivity analysis, excluding studies with different designs (using symbiotics, or different types of probiotics)
Nikolova et al., 2021	Depression	7	SIGN	Only one study (14 %) was reported with an overall assessment classified as high risk of bias	7	73 %	Moderate	Subgroups analysis by type of intervention (monotherapy or Add-on therapy) No sensitivity analysis was reported
Zagórska et al., 2020	Healthy/Depression	16	Jadad scale	Does not report the results of the risk of bias assessment in detail	16	79 %	Substantial	Subgroup analysis by type of population (healthy or depressed) No sensitivity analysis was reported
Zhu et al., 2022	Healthy/Depression	19	Cochrane (for RCT)	Four studies (27%) were assessed as having at least one high risk of bias ("Incomplete outcome data").	19	59.7 %	Moderate	Subgroup analysis by population (with/without depression), age (< 60, ≥60), treatment duration (< 8 and < 8 weeks), and type of treatment (single strain or multi-strain) A sensitivity analysis was reported

Notes:
[a]The target population in each overall meta-analysis is described. Acronyms for population: CC: chronic conditions; DS: depressive symptoms. Acronyms for subgroups: BDI: Beck Depression Inventory; HAM-D Hamilton Depression Scale; MADRS: Montgomery-Asberg Depression Rating Scale
[b]n = number of studies included in meta-analysis
[c]Tool used to evaluate risk of bias (RoB). Acronyms: SIGN: Scottish Intercollegiate Guidelines Network
[d]Notes regarding the risk of bias assessment for the studies included in meta-analysis
[e]n = number of efficacy comparisons included in each subgroup meta-analysis (this could be different from the number of studies since one study could have more than one group of population, interventions, or outcomes)
fClassification explained in methods section

Thirteen systematic reviews exploring probiotics as an alternative approach to alleviating depressive symptoms were included. Most of these systematic reviews were rated as poor. Some of the factors contributing to this result were the absence of protocol registration, insufficient clarity in reporting the studies excluded and funding sources, and lack of sensitivity analysis concerning the risk of bias.

Main findings

In general terms, the meta-review found evidence confirming the efficacy of prebiotics, probiotics, or symbiotics in addressing depressive symptomatology or diagnosed depression across varying clinical stages. As expected, reviews that included studies involving healthy individuals showed non-statistically significant evidence of treatment efficacy or minimal effect sizes (evaluated as *MD* or *SMD*).

Prebiotics efficacy was only demonstrated in one systematic review, specifically in a meta-analysis for the population with depression, with statistically significant evidence being obtained, except in one meta-analysis for people without depression (Hofmeister et al., 2021). No statistically significant evidence was found in another review for the use of prebiotics (Liu et al., 2019).

Stronger evidence of probiotic efficacy was found in almost all the selected systematic reviews, characterized by statistically significant hypothesis tests in the meta-analyses. However, effect sizes were low: *WMD* = -9.60 (Amirani et al., 2020); *MD* ranging from -3.2 to -1.98 (Desai et al., 2021; El Dib et al., 2021; Lin et al., 2023); and *SMD* ranging from .19 to .78 (Goh et al., 2019; Halemani et al., 2023; Huang et al., 2016; Hofmeister et al., 2021; Le Morvan de Sequeira et al., 2022; Liu et al., 2019; Nikolova et al., 2021; Zagórska et al., 2020; Zhu et al., 2022). These effect sizes may vary depending on factors such as demographic composition (age group, pregnancy), severity of depression (healthy population, those with depressive symptoms, or diagnosed depression), formulation type (single strain or multi-strain), treatment duration, and treatment modality (adjunctive or monotherapy).

Some reviews found greater efficacy of probiotics compared to prebiotics, as evidenced by hypothesis testing and effect sizes (Hofmeister et al., 2021; Liu et al., 2019). For instance, higher effect size for probiotics compared to prebiotics in the population with depression was reported in one review (*SMD* = .31 and .13, respectively) (Hofmeister et al., 2021).

In regard to symbiotics, a review found statistically significant evidence supporting their efficacy, even when implemented in a population without diagnosed depression. This suggests that the combined use of probiotics and prebiotics could yield an additive effect, despite one study conducted in individuals with depression revealing a non-statistically significant difference. However, an analysis of the effect size obtained in the meta-analysis of symbiotics in a healthy population (*SMD* = .68) found that it exceeded those obtained for probiotics or prebiotics (*SMD* = .31 and .13, respectively) (Hofmeister et al., 2021). Moreover, it is worth noting that some meta-analyses conducted for probiotics included studies using symbiotics, as they incorporated prebiotic substances in their formulation.

Significantly, a specific review conducted a subgroup analysis to compare the efficacy of probiotics or symbiotics as monotherapy or as adjunctive therapy to pharmacological treatment. The analysis found a statistically significant effect in the latter group only, with a substantially higher effect size (*SMD* = .83 and -.02, respectively), although the monotherapy subgroup comprised only two studies (Nikolova et al., 2021).

Moreover, the efficacy of probiotics or symbiotics in the treatment of depression appears to be greater when formulations include multiple species, as noted in two systematic reviews (Goh et al., 2019; Le Morvan de Sequeira et al., 2022; Zhu et al., 2022). Additionally, optimal efficacy may be achieved within the initial eight weeks of treatment, although a favorable impact could persist beyond this timeframe (Le Morvan de Sequeira et al., 2022; Lin et al., 2023). Only one review contradicted this pattern, but it included studies involving a healthy population, potentially resulting in less visible effects of adjunctive therapy with probiotics or symbiotics (Zhu et al., 2022).

Moreover, systematic reviews revealed that the efficacy of probiotics or symbiotics in treating depression could be more pronounced in subjects over 40, as demonstrated by subgroup analyses within meta-analyses exclusively involving a population with depressive symptomatology or depression (Amirani et al., 2020; Lin et al., 2023). It is striking that other meta-analyses presenting a contrasting result included a population without depressive symptomatology or diagnosed depression, potentially making the impact of probiotic or symbiotic use less obvious (Huang et al., 2016; Zhu et al., 2022).

It should be noted that none of the selected reviews conducted subgroup analyses for children and adolescents, indicating limited evidence regarding the efficacy of these interventions in these age groups. In addition, subgroup analyses for older adults were only undertaken in two reviews, although depression assessment scales specific to this age group were not used (Huang et al., 2016; Zhu et al., 2022).

Another significant observation is that some reviews conducted special meta-analyses or subgroup analyses for certain specific depression assessment scales, obtaining similar results. Reviews using the Beck Depression Inventory (BDI) scores yield statistically significant evidence (El Dib et al., 2021; Le Morvan de Sequeira et al., 2022; Lin et al., 2023), except for one review that enrolled patients diagnosed with major depressive disorders, although the effect size was large (assessed using *WMD*) (Amirani et al., 2020).Conversely, a review using the Hamilton Depression Scale (HAMD) obtained statistically significant findings involving studies with a population exhibiting moderate to major depression (Amirani et al., 2020), while another review using this scale and comprising a population without a diagnosis of depression failed to yield statistically significant results (Le Morvan de Sequeira et al., 2022). However, as mentioned earlier, this could be because in this group of individuals, it might be more difficult to identify improvements in depressive symptoms.

Other psychometric depression scales, such as the Depression, Anxiety and Stress Scale (DASS), Montgomery-Asberg Depression Rating Scale (MADRS), and Hospital Anxiety and Depression Scale (HADS-D), underwent meta-analyses or specific subgroup analyses, yielding no statistically significant results (El Dib et al., 2021; Le Mor-

van de Sequeira et al., 2022). This underscores the potential variability in the performance of different scales in assessing depressive symptomatology, meaning that it would be important to analyze their documented history of validity and reliability.

Implications for Clinical Practice and Research

In terms of clinical practice, it is worth considering recommending an alternative use of probiotics or symbiotics as adjuvant or complementary approaches to conventional pharmacological treatments to relieve depressive symptomatology. This could have numerous implications for health systems, such as the incorporation of these treatments into formularies and clinical practice guidelines for managing depression. Additionally, proactive interventions for their implementation should be initiated to enhance prescription and utilization.

Research opportunities identified through this review include the following: 1) investigating the efficacy of probiotics, prebiotics, and symbiotics in specific age groups with limited evidence, such as children, adolescents, and older adults, which could require special psychometric instruments to assess depressive symptomatology in these groups; 2) exploring the efficacy of these interventions over a prolonged period of time(beyond six months); 3) conducting meta-analyses of efficacy for particular probiotic species or particular probiotic species combinations; 4) establishing and evaluating treatment protocols to determine optimal doses, types, and durations of probiotic, prebiotic, and symbiotic consumption; 5) assessing the safety profiles and potential adverse reactions associated with short- and long-term consumption; and 6) studying the efficacy of these treatments in preventing depression, especially in populations prone to this disease (with the exception of pregnant women).

Strengths and limitations

Several strengths were identified in the present meta-review: 1) A systematic search was conducted across diverse databases; 2) Numerous systematic reviews on the topic of interest were found in the literature, leading to a meta-review approach; 3) Only systematic reviews with meta-analysis were included, ensuring that conclusions are based on the quantitative synthesis of at least two studies; 4) An evaluation of the quality of the reviews included in the meta-review was undertaken.

However, certain limitations were acknowledged within this meta-review. The research question was limited to Patient Reported Outcomes (PROs) as outcomes. However, other potential results, such as biochemical markers and the frequency of adverse events, could be explored.

Conclusions

In this meta-review, after the synthesis of several published meta-analyses, it was found that probiotic or symbiotic consumption tends to improve depressive symptoms, as borne out by comparing results with depression assessment scales. However, there are certain limitations on available evidence, especially for particular age groups (such as children, adolescents, and older adults), as well as specific efficacy analyses for particular species and combinations, among other research opportunities discussed earlier.

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Conflict of interest

The authors declare they have no conflict of interest.

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REFERENCES

American Psychiatric Association. (2016). *Manual diagnóstico y estadístico de los trastornos mentales: DSM-5* [*Diagnostic and Statistical Manual of Mental Disorders: DSM-5*] (5th ed.). Editorial Médica Panamericana.

Amirani, E., Milajerdi, A., Mirzaei, H., Jamilian, H., Mansournia, M. A., Hallajzadeh, J., & Ghaderi, A. (2020). The effects of probiotic supplementation on mental health, biomarkers of inflammation and oxidative stress in patients with psychiatric disorders: A systematic review and meta-analysis of randomized controlled trials. *Complementary Therapies in Medicine, 49*, 102361. https://doi.org/10.1016/j.ctim.2020.102361

Anguiano-Morán, A.C., Díaz de León-Castañeda, C., Rodríguez-Orozco, A.R., Valtierra-Oba, E.R., Lemus-Loeza, B.M. & Galván-Villalobos, G. (2024). Efficacy of probiotics, prebiotics, and symbiotics for the treatment of depression: a meta-review. *Research Registry*. Available at: https://www.researchregistry.com/browse-the-registry#registryofsystematicreviewsmeta-analyses/registryofsystematicreviewsmeta-analysesdetails/6610a6af52527e0027e4a05e/

Aromataris, E., Fernandez, R., Godfrey, C. M., Holly, C., Khalil, H., & Tungpunkom, P. (2015). Summarizing systematic reviews: Methodological development, conduct and reporting of an umbrella review approach. *International Journal of Evidence-Based Healthcare, 13*(3), 132-140. https://doi.org/10.1097/XEB.0000000000000055

Desai, V., Kozyrskyj, A. L., Lau, S., Sanni, O., Dennett, L., Walter, J., & Ospina, M. B. (2021). Effectiveness of Probiotic, Prebiotic, and Synbiotic Supplementation to Improve Perinatal Mental Health in Mothers: A Systematic Review and Meta-Analysis. *Frontiers in Psychiatry, 12*, https://doi.org/10.3389/fpsyt.2021.622181

Dinan, T. G., Stanton, C., & Cryan, J. F. (2013). Psychobiotics: A Novel Class of Psychotropic. *Biological Psychiatry, 7*4(10), 720-726. https://doi.org/10.1016/j.biopsych.2013.05.001

El Dib, R., Periyasamy, A. G., de Barros, J. L., França, C. G., Senefonte, F. L., Vesentini, G., Alves, M. G. O., Rodrigues, J. V. D. S., Gomaa, H., Gomes Júnior, J. R., Costa, L. F., Von Ancken, T. D. S., Toneli, C., Suzumura, E. A., Kawakami, C. P., Faustino, E. G., Jorge, E. C., Almeida, J. D., & Kapoor, A.

(2021). Probiotics for the treatment of depression and anxiety: A systematic review and meta-analysis of randomized controlled trials. *Clinical Nutrition ESPEN, 45*, 75-90. https://doi.org/10.1016/j.clnesp.2021.07.027

Goh, K. K., Liu, Y., Kuo, P., Chung, Y. E., Lu, M., & Chen, C. (2019). Effect of probiotics on depressive symptoms: A meta-analysis of human studies. *Psychiatry Research, 282*, 112568. https://doi.org/10.1016/j.psychres.2019.112568

Halemani, K., Shetty, A. P., Thimmappa, L., Issac, A., Dhiraaj, S., Radha, K., Mishra, P., & Mathias, E. G. (2023). Impact of probiotic on anxiety and depression symptoms in pregnant and lactating women and microbiota of infants: A systematic review and meta-analysis. *Journal of Global Health, 13*, 4038. https://doi.org/10.7189/jogh.13.04038

Higgins, J. P., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). *Measuring inconsistency in meta-analyses*. BMJ (Clinical research ed.), 327(7414), 557–560. https://doi.org/10.1136/bmj.327.7414.557

Hofmeister, M., Clement, F., Patten, S., Li, J., Dowsett, L. E., Farkas, B., Mastikhina, L., Egunsola, O., Diaz, R., Cooke, N. C., & Taylor, V. H. (2021). The effect of interventions targeting gut microbiota on depressive symptoms: a systematic review and meta-analysis. *CMAJ Open, 9*(4), E1195-E1204. https://doi.org/10.9778/cmajo.20200283

Hou, K., Wu, Z. X., Chen, X. Y., Wang, J. Q., Zhang, D., Xiao, C., Zhu, D., Koya, J. B., Wei, L., Li, J., & Chen, Z. S. (2022). Microbiota in health and diseases. *Signal transduction and targeted therapy, 7*(1), 135. https://doi.org/10.1038/s41392-022-00974-4

Hrncir, T. (2022). Gut Microbiota Dysbiosis: Triggers, Consequences, Diagnostic and Therapeutic Options. *Microorganisms, 10*(3), 578. https://doi.org/10.3390/microorganisms10030578

Huang, R., Wang, K., & Hu, J. (2016). Effect of Probiotics on Depression: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Nutrients, 8*(8), 483. https://doi.org/10.3390/nu8080483

Kumar, A., Pramanik, J., Goyal, N., Chauhan, D., Sivamaruthi, B. S., Prajapati, B. G., & Chaiyasut, C. (2023). Gut Microbiota in Anxiety and Depression: Unveiling the Relationships and Management Options. *Pharmaceuticals, 16*(4), 565. https://doi.org/10.3390/ph16040565

Le Morvan de Sequeira, C., Hengstberger, C., Enck, P., & Mack, I. (2022). Effect of Probiotics on Psychiatric Symptoms and Central Nervous System Functions in Human Health and Disease: A Systematic Review and Meta-Analysis. *Nutrients, 14*(3), 621. https://doi.org/10.3390/nu14030621

Lin, J., Zhang, Y., Wang, K., Wang, J., Kou, S., Chen, K., Zheng, W., & Chen, R. (2023). The effect and safety of probiotics on depression: a systematic review and meta-analysis of randomized controlled trials. *European Journal of Nutrition, 62*, 2709-2721 https://doi.org/10.1007/s00394-023-03184-y

Liu, R. T., Walsh, R. F., & Sheehan, A. E. (2019). Prebiotics and probiotics for depression and anxiety: A systematic review and meta-analysis of controlled clinical trials. *Neuroscience & Biobehavioral Reviews, 102*, 13-23. https://doi.org/10.1016/j.neubiorev.2019.03.023

Nikolova, V. L., Cleare, A. J., Young, A. H., & Stone, J. M. (2021). Updated Review and Meta-Analysis of Probiotics for the Treatment of Clinical Depression: Adjunctive vs. Stand-Alone Treatment. *Journal of clinical medicine, 1*0(4), 647. https://doi.org/10.3390/jcm10040647

Organización Panamericana de la Salud (OPS). (2017). Depresión y otros trastornos mentales comunes. Estimaciones sanitarias mundiales. OPS. Retrieved from: https://iris.paho.org/handle/10665.2/34006

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., Stewart, L. A., Thomas, J., Tricco, A. C., Welch, V. A., Whiting, P., & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ, n71*. https://doi.org/10.1136/bmj.n71

Pérez-Esparza, R. (2017). Tratamiento farmacológico de la depresión: actualidades y futuras direcciones. *Revista de la Facultad de Medicina de la UNAM, 6*0(5), 7-16.

Sarkar, A., Lehto, S. M., Harty, S., Dinan, T. G., Cryan, J. F., & Burnet, P. W. (2016). Psychobiotics and the Manipulation of Bacteria–Gut–Brain Signals. *Trends in Neurosciences, 39*(11), 763-781. https://doi.org/10.1016/j.tins.2016.09.002

Shea, B. J., Reeves, B. C., Wells, G., Thuku, M., Hamel, C., Moran, J., Moher, D., Tugwell, P., Welch, V., Kristjansson, E., & Henry, D. A. (2017). AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ*, j4008. https://doi.org/10.1136/bmj.j4008

Sikorska, M., Antosik-Wójcińska, A. Z., & Dominiak, M. (2023). Probiotics as a Tool for Regulating Molecular Mechanisms in Depression: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. I*nternational Journal of Molecular Sciences, 24*(4), 3081. https://doi.org/10.3390/ijms24043081

Smith, V., Devane, D., Begley, C. M., & Clarke, M. (2011). Methodology in conducting a systematic review of systematic reviews of healthcare interventions. *BMC Medical Research Methodology, 11*(1), 15. https://doi.org/10.1186/1471-2288-11-15

Zagórska, A., Marcinkowska, M., Jamrozik, M., Wiśniowska, B., & Paśko, P. (2020). From probiotics to psychobiotics – the gut-brain axis in psychiatric disorders. *Beneficial Microbes, 11*(8), 717-732. https://doi.org/10.3920/bm2020.0063

Zhu, H., Tian, P., Zhao, J., Zhang, H., Wang, G., & Chen, W. (2022). A psychobiotic approach to the treatment of depression: A systematic review and meta-analysis. *Journal of Functional Foods, 9*1, 104999. https://doi.org/10.1016/j.jff.2022.104999

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REVIEW ARTICLE
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Psychometric Properties of Tools for Assessing Spirituality: A Scoping Review

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ABSTRACT

Background The study of spirituality has gained importance, as it correlates with mental health and coping strategies, particularly at times of vulnerability. Spirituality could therefore contribute to the development of interventions to improve people's quality of life. Experts often base the development of interventions and treatments on instruments measuring constructs such as spiritual well-being, which requires validated, reliable instruments. **Objective**. This scoping review sought to summarize the evidence in the literature on the instruments available to assess spirituality in different groups and evaluate the content and psychometric properties of these instruments. **Method.** A search was conducted on PubMed, Virtual Health Library (VHL), Elsevier, Springer, Scopus, and Google Scholar databases, using a combination of keywords such as "spirituality," "validation study," and "psychometrics." The search was restricted to studies published in English and Spanish from January 2013 to March 2023. **Results**. Sixty-four studies were included in this review. Two categories of analysis were established, the first being constructs related to spirituality and instruments for their measurement, in which a total of 22 conceptual constructs were found. The second was the validity and reliability of the instruments, in which it was found that most studies only assessed construct validity. **Discussion and conclusion.** Given the complexity of the phenomenon, many instruments lack conceptual boundaries, resulting in similarities between items in instruments measuring different constructs. Determining the attributes and dimensions for the accurate measurement of spirituality is essential.

Keywords: Spirituality, health surveys, psychometrics, review.

RESUMEN

Antecedentes. Actualmente, el estudio de la espiritualidad ha cobrado relevancia ya que se correlaciona con la salud mental y estrategias de afrontamiento, especialmente en situaciones vulnerables de la vida. Comprender este fenómeno podría ayudar al desarrollo de intervenciones para mejorar la calidad de vida de las personas y, por ende, se requiere de instrumentos validados y confiables para la medición de la espiritualidad. **Objetivo**. Se realizó una revisión de alcance para sintetizar la evidencia sobre los instrumentos disponibles para valorar la espiritualidad en diferentes grupos de personas y evaluar el contenido y propiedades psicométricas de estos instrumentos. **Método.** Se condujo una búsqueda en las bases de datos PubMed, Biblioteca Virtual en Salud, Elsevier, Springer, Scopus y Google Scholar, utilizando los términos "espiritualidad", "estudio de validación" y "psicometría". La búsqueda se limitó a estudios publicados en inglés y español desde enero de 2013 hasta marzo de 2023. **Resultados.** Se incluyeron 64 estudios. Se establecieron dos categorías de análisis: la primera categoría son los constructos relacionados con la espiritualidad y sus instrumentos de medición, donde se encontraron un total de 22 constructos conceptuales, y la segunda categoría es la validez y confiabilidad de los instrumentos en la que se encontró que la mayoría de los estudios únicamente evaluaron validez de constructo. **Discusión y conclusión.** Dada la complejidad del fenómeno, muchos instrumentos carecen de una delimitación conceptual, lo que propicia similitudes entre los ítems de instrumentos que miden diferentes constructos Es necesario delimitar los atributos y dimensiones para una adecuada medición de la espiritualidad.

Palabras clave: Espiritualidad, encuestas de salud, psicometría, revisión.

BACKGROUND

As holistic beings, humans have multiple dimensions, including the physical, mental, social, and spiritual, the last of which develops differently in each individual (Morales Contreras & Palencia Sierra, 2021). Spirituality as a dimension allows one to not only connect with a belief system, a higher self, or whatever we consider divine but also with those around us and the environment (Fuentes et al., 2018). Spirituality transcends the intra-, inter-, and transpersonal dimensions of human beings. Despite being abstract, it is essential. Cultivating spirituality is important for people to achieve health and well-being (de Diego-Cordero et al., 2022). Individuals who fail to develop their spirituality fully or comprehensively may struggle to find life satisfaction (Caccia & Elgier, 2020).

Spirituality is a factor in achieving transcendence, which in turn leads to states of mental well-being in the individual (Reed, 2018, 2021) expressed through feelings of wholeness, meaning, fulfillment, and mental health (Reed & Haugan, 2021). Incorporating spiritual care into practice is therefore part of comprehensive, holistic care (Morales Contreras & Palencia Sierra, 2021).

In this respect, it is essential to have valid, reliable measurement instruments with scientific, methodological rigor to enhance the practice of health professionals and research in this area. These instruments should be able to assess subjective attributes with complex dimensions for the health-disease process of the population and concepts as significant as spirituality (Muñiz & Fonseca-Pedrero, 2019).

Measurement instruments delimit the definition of the concepts to distinguish them from others (Epstein et al., 2015). This facilitates the operationalization of variables and promotes coherence between concepts, constructs, dimensions, and items or empirical indicators (Herdman et al., 1998). Moreover, the design and validation of instruments for abstract phenomena unifies definitions according to a theoretical or conceptual point of reference, thereby avoiding using, misusing, or confusing similar terms and providing guidelines for developing new research (Sánchez-Villena et al., 2021).

Spirituality is increasingly being incorporated into clinical practice at various levels of care (Pagán-Torres, 2022). There are several measurement instruments assessing spirituality from different theoretical and philosophical perspectives. One example is Reed's Self-Transcendence Scale, adapted to Spanish (Pena-Gayo et al., 2018) and based on the middle-range theory of self-transcendence. Another example is Piedmont's Assessment of Spirituality and Religious Sentiments (ASPIRES) scale, which assesses spirituality through two dimensions: religious sentiments and spiritual transcendence. This scale is based on a psychological theory incorporating spirituality as a sixth factor within the five-factor model of personality (Simkin, 2017).

Spirituality has also been used as a dimension for assessing other phenomena essential to people's well-being. For example, spiritual well-being is a factor in the Meaning in Life Questionnaire (Steger et al., 2006) used in clinical practice and research in palliative care (Schiappacasse Cocio & González Soto, 2016). Due to its abstract, multifaceted nature, spirituality poses challenges for its accurate, reliable measurement, making it essential to know the psychometric properties of the instruments designed and validated in the past ten years to measure this phenomenon. This review will enable us to identify the emerging concepts and definitions, the number of scales developed, the language, populations and cultures in which they have been validated, as well as the level of validity and reliability they present. It is therefore crucial to know what types of validation are most commonly used with these measurement instruments.

This scoping review seeks to contribute to clinical practice and health research by providing an exhaustive matrix that incorporates key elements for selecting the instruments to measure spirituality. This matrix would provide useful evidence for the decision-making of those who wish to use these instruments in both research and clinical practice in this field. Our objective was therefore to summarize the evidence in the literature on the instruments available to assess spirituality in various patient groups and to evaluate the contents and psychometric properties of these instruments.

METHOD

Study design

The following research is a scoping literature review, based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR; Tricco et al., 2018). This review was conducted in five stages: 1) problem identification, based on a research question or guiding search question; 2) literature search in databases; 3) data evaluation; 4) data analysis, and 5) presentation of results.

Problem identification

According to the stated objective, the following guiding question was suggested: What scales or instruments for assessing spirituality have been published in the literature in the past ten years with validity and reliability testing?

Literature search

A search of PubMed, Virtual Health Library (VHL), Elsevier, Springer, Scopus, and Google Scholar databases was

conducted between January and March 2023. The DeCS/MeSH Health Science Descriptors "*espiritualidad*" AND ("*estudios de validación*" OR "*psicometría*") were used in Spanish and "spirituality" AND ("validation study" OR "psychometrics") in English.

Original research articles exploring the design, translation, adaptation and/or validation of instruments related to spirituality, published in Spanish or English between January 2013 and March 2023, and responding to the guiding question were included in the review process. Published articles that did provide a detailed description of the methodological process of designing, translating, adapting, and/or validating the instruments or the different types of validity (content, construct, criterion, convergent, discriminant) were excluded, as well as letters to the editor, conference abstracts, book chapters, and literature reviews.

Searching the databases using the descriptors yielded 16,119 studies. A total of 15,983 of these were then excluded after reading the title and abstract because they failed to meet the selection criteria, and 25 because they were duplicates. Afterwards, the full texts of 111 articles were read, and 36 studies were excluded because they failed to specify the methodological design related to validity testing (design, translation, adaptation and content, construct, criterion, convergent, or discriminant validity). Lastly, 64 studies were included in the scoping review, and eight were excluded for containing incomplete information on validity and reliability statistics. The entire selection process is presented in Figure 1.

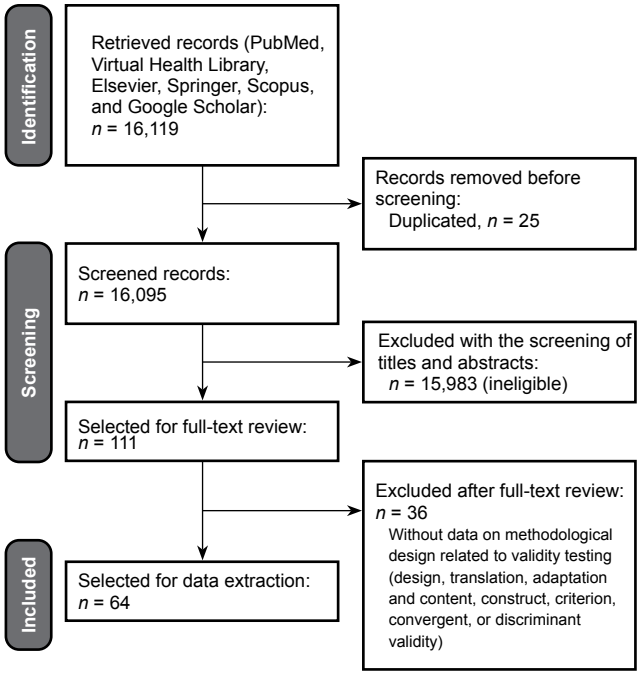

Figure 1. Flow Chart of the Selection Process of the Studies.

Data evaluation

Methodological quality was first assessed separately by the researchers and then by consensus. We began by reading the full text of the studies and then proceeded to rate the methodological quality individually using the COSMIN Risk of Bias checklist (Mokkink et al., 2018). The COSMIN checklist assesses methodological rigor and risk of bias according to the type of validity tested by the survey researchers. The appropriate boxes are filled in by study type to determine the overall quality of the study. The lowest score of each evaluated standard is used, using the "worst score counts" principle.

Data were summarized in a database created by the researchers, detailing the characteristics of the studies: database, authors, name of scale, country of validation, language of validation, language of publication, country of study, population, main concept of instrument, theoretical basis of concept, dimensions of concept or subscales, and validity and reliability. Results were analyzed, evaluated, and interpreted based on the planned objective and guiding search question. The researchers worked together to complete this process. Duplicates were discarded using Mendeley software (Elsevier © 2018).

Data analysis

After the reviewers' quality assessment and selection of studies, the recommendations of PRISMA-ScR (2018) were followed. The first phase in data analysis was data reduction, which involved synthesizing the information found through an overall classification system. To this end, a matrix was created with the characteristics of the studies: database, authors, name of scale, country of validation, language of validation, language of publication, country of study, population, main concept of instrument, theoretical basis of concept, dimensions of concept or subscales, and validity and reliability.

The next phase of the data analysis was data display, which involved examining the display of the primary information sources to identify patterns, themes, and relationships. This enabled all the derived, defined, and validated constructs assessing spirituality in people to be identified. During the third phase, involving data comparison, the instruments were grouped according to the construct assessed, and some of the results found were compared, as well as the types of validity testing among the instruments. As a result of these two phases, two essential contents or categories were identified that will be presented in the following section: constructs related to spirituality and their measurement scales and the validity and reliability of the instruments or scales for assessing spirituality. During the final phase, we drew and verified conclusions. We then condensed the main elements and arrived at overall conclusions that are useful for both practice and research.

RESULTS

General Description of Studies

Table 1 describes the characteristics of the measurement instruments or scales reviewed. Validated measurement instruments were mostly found in Asian and Middle Eastern countries (31%, *n* = 20), such as China, Iran, India, Taiwan, Turkey, Israel, Jordan, and South Korea, and European ones (28%, *n* = 18), such as Poland, Italy, Portugal, Germany, Slovakia, Spain, France, Ireland, the United Kingdom, and Sweden. Twenty percent of the instruments (*n* = 13) were validated in South and Central American countries such as Brazil, Argentina, Chile, Colombia, Peru, and Puerto Rico, and 17% (*n* = 11) in North American countries, mainly the United States and Mexico. Only two multicenter studies were identified (4%). Regarding the language of publication, 83% (*n* = 53) of the articles reviewed were published in English and 17% (*n* = 11) in Spanish.

Constructs Related to Spirituality and its Measurement Scales

In the present review, 22 conceptual constructs were identified that assess spirituality or some aspect of the latter. These constructs are shown in Table 2. The construct related to spirituality with the largest number of instruments is spiritual care or spiritual care competence, with a total of ten instruments. In general, these scales assess the level of spiritual care or the ability of nurses or other healthcare professionals to provide spiritual care (Adib-Hajbaghery & Zehtabchi, 2016; Benito et al., 2014; Daaleman et al., 2014; Guilherme et al., 2020; Hu et al., 2019; İpek Çoban et al., 2017; Kabakci et al., 2022; Pais et al., 2022; Pastrana et al., 2021; Xie et al., 2019). According to the operational definitions and constructs of these instruments, spiritual care competence is defined as the ability of nurses or health professionals to identify spiritual needs and to plan and implement care plans, activities or interventions that enhance the spiritual dimension of the subject of care (Adib-Hajbaghery & Zehtabchi, 2016; Benito et al., 2014; Daaleman et al., 2014; Guilherme et al., 2020; Hu et al., 2019; İpek Çoban et al., 2017; Kabakci et al., 2022; Pais et al., 2022; Pastrana et al., 2021; Wang et al., 2022; Xie et al., 2019).

Another construct with the largest number of instruments found was spirituality from a theocentric perspective (spirituality/religiosity), with eight instruments (Berger et al., 2016; Erci & Aktürk, 2018; Gallardo-Peralta et al., 2018; Gonçalves et al., 2016; Oñate et al., 2015; Simkin, 2017; Vespa et al., 2017). These scales are striking because they include dimensions such as the connection to God or a higher power and transcendental phenomena such as death (Berger et al., 2016; Díaz-Castillo et al., 2021; Gallardo-Peralta et al., 2018; Gonçalves et al., 2016; Vespa et al., 2017). Items in these dimensions address the most common religious practices, such as prayer, meditation, fasting, and the reading of sacred books, and would be the empirical indicators of the connection with God.

Some instruments assess spirituality as a broad, holistic, multi-dimensional concept. Seven measurement instruments were found that assess spirituality from multiple perspectives and had been validated in different populations. One of the most outstanding features of these instruments is that they have subscales assessing three or more dimensions of spirituality, such as intrapersonal, extrapersonal, and transpersonal connections (González-Rivera & Pagán-Torres, 2018; González-Rivera, Quintero-Jiménez et al., 2017; González-Rivera, Veray-Alicea, et al., 2017; Makkar & Singh, 2021; Nawafleh et al., 2018; Schiappacasse Cocio & González Soto, 2016; Weathers et al., 2020; González-Rivera, et al., 2018).

Spirituality as a holistic dimension has conceptually abstract dimensions, such as meaning (Deluga et al., 2020; González-Rivera & Pagán-Torres, 2018) and self-awareness (Weathers et al., 2020), in some of the instruments reviewed. Spiritual needs are another construct identified (Lin et al., 2015; Moeini et al., 2018; Wu et al., 2016; Zhao et al., 2019). These instruments are designed for people who require spiritual care. Although identifying spiritual needs can be extremely useful, this review did not identify any scales available in Spanish or validated in Spanish-speaking countries that addressed spiritual needs.

The definitions provided in the instruments (Lin et al., 2015; Moeini et al., 2018; Wu et al., 2016; Zhao et al., 2019) suggest that spiritual needs are what people must satisfy to fully develop spirituality or any of its dimensions.

The spiritual and religious experiences construct (Lo et al., 2016; Saffari et al., 2017; Soósová & Mauer, 2021; Wang et al., 2022; Yepes Martinez et al., 2023) assesses spirituality and religiosity from multiple perspectives, including intrapersonal aspects such as meaning, peace, and faith (Saffari et al., 2017), religiosity (Lo et al., 2016; Soósová & Mauer, 2021; Yepes Martinez et al., 2023) and attention to spiritual needs (Wang et al., 2022; Yepes Martinez et al., 2023).

Other constructs assessing spirituality found were religious and spiritual coping (Feng et al., 2019; González-Rivera & Pagán-Torres, 2018; Tomás & Rosa, 2021), spiritual and religious attitudes (Büssing et al., 2016; Deluga et al., 2020), self-transcendence (Lundman et al., 2015; Pena-Gayo et al., 2018), spiritual distress (Simão et al., 2016), spiritual self-care (White & Schim, 2013), spiritual support (Fopka-Kowalczyk et al., 2023; Levine et al., 2015), spiritual well-being (Agli et al., 2017; Ahmad et al., 2022; Deng et al., 2021; Nooripour et al., 2023; Rabitti et al., 2020), spiritual and/or religious engagement (Martins et al., 2021; Roof et al., 2017), connectedness (Watts et al., 2022), spiritual comfort (Pinto et al., 2016), religious beliefs (Gallegos et

Table 1
Characteristics of the Measurement Instruments or Scales Found in the Integrative Review

Authors/year	*Scale title*	*Country of validation*	*Language of validation*	*Language of publication*	*Population*
Adib & Zehtabchi, 2016	Instrument to assess nurses' professional competence in spiritual care	Iran	Farsi	English	Nurses
Agli et al., 2017	Functional Assessment of Chronic Illness Therapy—Spiritual Well-being short version (FACIT-Sp12)	France	French	English	Older adults in nursing homes
Ahmad et al., 2022	Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale (FACIT-Sp)	USA	English	English	Adults with life-limiting medical illnesses
Becerra Canales & Becerra Huaman, 2020	*Escala de inteligencia espiritual en la práctica sanitaria (EIEps)*	Peru	Spanish	Spanish	Healthcare workers
Benito et al., 2014	*Cuestionario GES (Grupo Espiritualidad SECPAL)*	Spain	Spanish	English	Palliative care patients
Berger et al., 2016	Multidimensional Inventory for Religious/Spiritual Well-Being (MI-RSWB)	Mexico	Spanish	English	Nursing students
Burke et al., 2013	Inventory of Complicated Spiritual Grief (ICSG)	USA	English	English	Christian adults and college students
Burke et al., 2021	Inventory of Complicated Spiritual Grief 2.0 (ICSG 2.0)	USA	English	English	Adults
Büssing et al., 2016	Polish version of Spiritual and Religious Attitudes in Dealing with Illness 8(SpREUK)	Poland	Polish	English	Adults with chronic diseases
Schiappacasse Cocio & González Soto,2016	Meaning in Life Scale (MILS)	Latin-American	Spanish	English	Cancer patients receiving palliative care
Daaleman et al., 2014	Quality of Spiritual Care (QSC) scale	USA	English	English	Family caregivers
Deluga et al., 2020	Spiritual Attitude and Involvement List (SAIL)	Poland	Polish	English	Nurses
Deng et al., 2021	Functional Assessment of Chronic Illness Therapy—Spiritual Well-Being Scale (FACIT-Sp)	USA	English	English	Heart failure patients
Díaz-Castillo et al., 2021	Escala Trifactorial de Espiritualidad	Mexico	Spanish	Spanish	Older adults
Elhai et al., 2018	SHALOM Spiritual Questionnaire	Israel	Hebrew	Spanish	Adults
Erci & Aktürk, 2018	System of Belief Inventory	Turkey	Turkish	English	Cancer patients
Feng et al., 2019	Spiritual Intelligence Scale-Chinese Form	China	Mandarin	English	Students and adults

Table 1
Characteristics of the Measurement Instruments or Scales Found in the Integrative Review (Continued)

Authors/year	*Scale title*	*Country of validation*	*Language of validation*	*Language of publication*	*Population*
Feng et al., 2021	Chinese Spiritual Coping Scale (CSCS)	China	Mandarin	English	Adults
Fopka-Kowalczyk et al., 2023	Spiritual Supporter (SpSup) Scale	Poland	Polish	English	Medical students
Gallardo-Peralta et al., 2018	Índice Breve de Religiosidad y Espiritualidad	Chile	Spanish	Spanish	Older adults
Gallegos et al., 2021	System of Beliefs Inventory (SBI-15R)	Peru	Spanish	English	Adults
Głaz, 2021	Scale of Abandonment by God (SAG)	Poland	Polish	English	University students
Gonçalves et al., 2016	Treatment Spirituality / Religiosity Scale (TSRS)	Brazil	Portuguese	English	Nursing students
González-Rivera & Pagán-Torres, (2018	Inventario de Estrategias de Afrontamiento Religioso (IEAR)	Puerto Rico	Spanish	Spanish	Adults
González-Rivera, Veray-Alicea, et al., 2017	*Escala de Espiritualidad Personal* (EPP)	Puerto Rico	Spanish	Spanish	Adults
González-Rivera, et al., 2018	*Escala de espiritualidad de Delaney*	Puerto Rico	Spanish	Spanish	Adults
Guilherme et al., 2020	Spiritual Care Competence Scale (SCCS)	Brazil	Portuguese	English	Nursing students
Hu et al., 2019	Chinese version of the Spiritual Care Competence Scale (C-SCCS)	China	Mandarin	English	Nurses
İpek et al., 2017	Spiritual Care-Giving Scale	Turkey	Turkish	English	Nursing students
Kabakci et al., 2022	Spiritual Care Competence Scale (SCCS)	Turkey	Turkish	English	Midwives
Kang et al., 2022	Korean version of the Nurse Spiritual Care Therapeutics Scale (NSCTS-K)	South Korea	Korean	English	Nurses
Levine et al., 2015	Spiritual support subscale for the Medical Outcomes Study Social Support Scale (MOS-SSS)	USA	English	English	Cancer survivors
Lin et al., 2015	Chinese version of the Spiritual Interests Related Illness Tool (C-SpIRIT)	Taiwan	Mandarin	English	Adults
Lo et al., 2016	Daily Spiritual Experiences Scale–Chinese (DSES-C)	USA	English	English	Cancer patient
Lundman et al., 2015	Swedish version of Self-Transcendence Scale	Sweden	Swedish	English	Older adults

Table 1
Characteristics of the Measurement Instruments or Scales Found in the Integrative Review (Continued)

Authors/year	*Scale title*	*Country of validation*	*Language of validation*	*Language of publication*	*Population*
Makkar & Singh, 2021	Spirituality Measurement Scale (SMS)	India	Hindi	English	University students
Martins et al., 2021	Validation of Duke University Religion Index (P-DUREL)	Portugal	Portuguese	English	Cancer patients receiving chemotherapy
Moeini et al., 2018	Spiritual Needs Questionnaire (SpNQ).	Iran	Farsi	English	Elders with chronic diseases
Nawafleh et al., 2018	Spiritual Questionnaire	Jordan	Arabic	English	University students
Nooripour et al., 2023	Spiritual Well-being Scale (SWBS)	Iran	Farsi	English	Older adults
Oñate et al., 2015	*Breve evaluación multidimensional de la religiosidad y la espiritualidad*	Argentina	Spanish	Spanish	Young adults
Pais et al., 2022	Spirituality and Spiritual Care Rating Scale (SSCRS)	India	Hindi	English	Nurses
Pastrana et al., 2021	Spiritual Care Competence Questionnaire (SCCQ)	Argentina, Colombia, Mexico, and Spain	Spanish	English	Healthcare professionals
Pena-Gayo et al., 2018	*Escala de autotrascendencia*	Spain	Spanish	Spanish	Adults
Pinto et al., 2016	Portuguese End of Life Spiritual Comfort Questionnaire	Portugal	Portuguese	English	Palliative care patients
Proyer & Laub, 2017	Expressions of Spirituality Inventory-Revised (ESI-R)	Germany	German	English	Adults
Rabitti et al., 2020	Functional Assessment of Chronic Illness Therapy-Spiritual (FACIT-Sp)	Italy	Italian	English	Cancer patients
Riveros et al., 2018	*Inventario de Sistema de Creencias* (SBI-15 R)	Colombia	Spanish	Spanish	University student and chronic disease patients
Roof et al., 2017	Spiritual Engagement Instrument (SpEI)	USA	English	English	Adults
Saffari et al., 2017	Daily Spiritual Experiences Scale (DSES)	Iran	Farsi	English	Pregnant women
Simão et al., 2016	Spiritual Distress Scale	Brazil	Portuguese	English	Cancer patients
Simkin, 2017	Escala de evaluación de espiritualidad y sentimientos religiosos (ASPIRES)	Argentina	Spanish	Spanish	University students

Table 1
Characteristics of the Measurement Instruments or Scales Found in the Integrative Review (Continued)

Authors/year	*Scale title*	*Country of validation*	*Language of validation*	*Language of publication*	*Population*
Soósová & Mauer, 2021	Daily Spiritual Experience Scale (DSES)	Slovakia	Slovak	English	Older adults
Tomás & Rosa, 2021	Scale of Religious and Spiritual Coping (RCOPE)	Portugal	Portuguese	English	Adults
Vespa et al., 2017	Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS)	Italy	Italian	English	Older adults
Wang et al., 2022	Spiritual Enlightenment Experience Scale (SEES)	China	Mandarin	English	Adults
Watts et al., 2022	Watts Connectedness Scale (WCS)	UK	English	English	Adults
Weathers et al., 2020	Spirituality Instrument 27 (SpI-27©)	Ireland	Irish	English	Chronic disease patients
White & Schim, 2013	Spiritual Self-Care Practices Scale (SSCPS)	USA	English	English	Patients with heart failure
Wu et al., 2016	Spiritual Care Needs Inventory (SCNI)	Taiwan	Mandarin	English	Hospitalized adults
Xie et al., 2019	Nurse Spiritual Therapeutics Scale (NSTS)	China	Mandarin	English	Cancer patients
Yepes Martinez et al., 2023	The Italian version of the Daily Spiritual Experience Scale (DSES-IT)	Italy	Italian	English	Patients with psychiatric disorders
Zhao et al., 2019	Chinese version of the Spiritual Needs Questionnaire with 27 items (SpNQ-Ch-27)	China	Mandarin	English	Cancer patients

Table 2
Constructs related to spirituality and its validated scales

Constructs related to spirituality	*Definition*	*Validated scales*
Religious and spiritual coping	Religious coping refers to cognitive, behavioral, and interpersonal responses using religious/spiritual beliefs and practices to facilitate problem-solving and prevent or alleviate the negative emotional consequences of stressful life situations. Coping can occur positively or negatively (Tomás & Rosa, 2021). Spiritual coping involves using practices related to spirituality (the inner power of the human body, which promotes the growth of the human mind and helps people understand the meaning of life) to overcome problems or stressors (Feng et al., 2021). Use of internal and external strategies based on religion to manage stressful situations. Internal strategies are associated with personal faith and internal reflection, whereas external strategies involve participation in religious activities and support from the faith community (González-Rivera & Pagán-Torres, 2018).	Scale of Religious and Spiritual Coping (RCOPE) (Tomás & Rosa, 2021); Chinese Spiritual Coping Scale (CSCS) (Feng et al., 2021) ; I*nventario de Estrategias de Afrontamiento Religioso* (IEAR) (González-Rivera & Pagán-Torres, 2018)
Spiritual and Religious Attitudes	Operational definition not reported.	Spiritual and Religious Attitudes in Dealing with Illness (SpREUK) (Büssing et al., 2016); Spiritual Attitude and Involvement List (SAIL) (Deluga et al., 2020)
Self-transcendence	Human skill to expand one's limits in the interpersonal (with others), intrapersonal (to one's person), transpersonal (with a spiritual dimension), and temporal dimensions (integrating the past and the future to lend meaning to the present). This evolutionary capacity provides purpose and meaning for human existence in the face of individual and environmental limits and can be evaluated at a specific point in the life cycle (Pena-Gayo et al., 2018).	Reed's Self-Transcendence Scale (Pena-Gayo et al., 2018; Lundman et al., 2015)
Spiritual distress	A time in life when a person experiences profound discord or disharmony with their faith, spirituality, belief system, or values, which threatens their perception of the meaning of life (Simão et al., 2016).	Spiritual Distress Scale (Simão et al., 2016)
Spiritual self-care	Spiritual self-care refers to the way people relate to their subjectivity, including the belief in relationships with others, the existential connection established with a higher entity, and the feeling of being connected to the world. Spiritual self-care is influenced by dispositions toward spirituality and encourages people to establish positive, reciprocal relationships with others, rebuild relationships, and volunteer in mutual aid groups. In addition, it involves practices such as prayer, meditation, mindfulness, yoga and Tai Chi, contact with nature, and participation in religious or self-help groups (White & Schim, 2013).	Spiritual Self-Care Practices Scale (SSCPS) ((White & Schim, 2013)
Spiritual support	The operational definition was not reported in the included manuscripts.	Spiritual support subscale for the Medical Outcomes Study Social Support Scale (MOS-SSS) (Levine et al., 2015); Spiritual Supporter (SpSup) Scale (Fopka et al., 2023)
Spiritual well-being	A comprehensive sense of meaning and purpose in life, harmony and peace, together with a source of strength and comfort derived from one's faith and spiritual beliefs. This state includes a deep sense of understanding and purpose in life, a reconciliation with adverse circumstances, and the strength and comfort that comes from personal faith and spiritual beliefs (Rabitt et al., 2020).	Functional Assessment of Chronic Illness Therapy—Spiritual Well-being short version (FACIT-Sp12) (Agli et al., 2017; Rabitt et al., 2020; Ahmad et al., 2022; Deng et al., 2021); Spiritual Well-being Scale (SWBS) (Nooripour et al., 2023)

Table 2
Constructs related to spirituality and its validated scales (continued)

Constructs related to spirituality	*Definition*	*Validated scales*
Spiritual care competence / Spiritual care	Spiritual care competence is the systematic care nurses provide to address patients' spiritual needs. This includes specific attributes and competencies to effectively provide spiritual care (Guilherme et al., 2020). Spiritual care refers to activities and procedures intended to improve people's spiritual well-being and performance, as well as the quality of spiritual life. Spiritual care has positive effects on stress, the balance between physical, psychosocial, and spiritual aspects, the sense of integrity and excellence, and interpersonal relationships. Although spiritual care is not synonymous with religious or psychosocial care, it is related to providing comprehensive care that fosters vitality and meaning in life (Adib-Hajbaghery & Zehtabchi, 2016).	Spiritual Care Competence Scale (SCCS) (Guilherme et al., 2020), Instrument to assess the nurses' professional competence in spiritual care (Adib-Hajbaghery & Zehtabchi, 2016); Spiritual Care Competence Questionnaire (SCCQ) (Pastrana et al., 2021), Spiritual Care Competence Scale (SCCS) (Kabakci & Çelik, 2022); Nurse Spiritual Therapeutics Scale (NSTS) (Xie et al., 2019); Spiritual Care-Giving Scale (İpek et al., 2017); Quality of Spiritual Care (QSC) scale (Daaleman et al., 2014); the Chinese version of the Spiritual Care Competency Scale (C-SCCS) (Hu et al., 2019); Spirituality and Spiritual Care Rating Scale (SSCRS) (Pais et al., 2022); *Cuestionario GES* (Grupo Espiritualidad SECPAL) (Benito et al., 2014)
Spiritual/religious engagement	Participation and practices in religious or spiritual activities with the motivation to grow and transform spiritually. Spiritual/religious engagement involves not only external behaviors, such as prayer and attendance at religious services, but also the internal beliefs, attitudes, intentions, and expectations that motivate these practices. Spiritual commitment seeks a deeper relationship with God and leads to the affective, cognitive transformation of individuals, impacting their ethics, values, identity, and organizational relationships (Roof et al., 2017)	Validation of the Duke University Religion Index (P-DUREL) (Martins et al., 2021), Spiritual Engagement Instrument (SpEI) (Roof et al., 2017)
Connectedness	Connectedness is a state characterized by the presence of feelings of connection with oneself, others, and the world in general (Watts et al., 2022).	Watts Connectedness Scale (WCS) (Watts et al., 2022)
Spiritual comfort	The operational definition was not reported in the included manuscripts.	Portuguese End-of-Life Spiritual Comfort Questionnaire (Pinto et al., 2016)
Religious beliefs	The concept was not clearly defined in the studies. Several definitions of religiosity were found, but no definition of religious beliefs	System of Beliefs Inventory (SBI-15R) (Gallegos et al., 2021; Riveros et al., 2018)
Spiritual grief	Spiritual grief is a spiritual crisis during grief that includes the collapse or loss of the relationship with God, a higher power, and/or the community of faith, such that he or she struggles to restore spiritual balance after the loss (Burke et al., 2014; 2021).	Inventory of Complicated Spiritual Grief (ICSG) (Burke et al., 2014); Inventory of Complicated Spiritual Grief 2.0 (ICSG 2.0) (Burke et al., 2021)

Table 2
Constructs related to spirituality and its validated scales (continued)

Constructs related to spirituality	*Definition*	*Validated scales*
Spirituality	Subjective, mystical, and holistic interpretation of personal beliefs and behaviors. This internal interpretation of reality influences how individuals perceive their environment and how they react and interact with the elements of this environment (Nawafleh et al., 2018). Spirituality is a multidimensional phenomenon that is experienced universally, partially socially constructed, and individually developed throughout life through the search for meaning, transcendence, and connection in relationships with oneself, with other people, with nature, or with the sacred. It can include non-theistic and non-religious approaches, as well as theistic and religious approaches (González-Rivera, Veray-Alicea, et al., 2017; González-Rivera et al., 2018). Spirituality is a human ability that encompasses experiential aspects related to both religious practices and the recognition of a generalized feeling of peace and union. This concept is part of all cultures and constitutes the framework in which a fundamental or transcendent purpose is sought, whether through religion or other means. Spirituality includes accessible feelings such as inner peace, the meaning of existence, and the purpose of life, without necessarily being associated with religion (Schiappacasse Cocio & González Soto, 2016).	Spirituality Measurement Scale (SMS) (Makkar et al., 2021); Spirituality Instrument 27 (SpI-27©) (Weathers et al., 2020); Spiritual Questionnaire (Nawafleh et al., 2018); *Escala de espiritualidad personal* (EPP) (González-Rivera, Veray-Alicea, et al., 2017; González-Rivera et al., 2018); *Escala de espiritualidad de Delaney* (González-Rivera, Quintero-Jiménez, et al., 2017); Meaning in Life Scale (MILS) (Schiappacasse Cocio & González Soto, 2016)
Spirituality / Religiosity	According to Vespa et al. (2017), spirituality is the personal and introspective search through various cultural, religious, or secular routes, which must be carefully considered in the management of patients affected by diseases. Spirituality is one of the main factors allowing people to face and manage suffering due to illness with confidence and dignity. According to Oñate et al. (2015), spirituality is an individual experience of connection with a higher being or with the purpose and meaning of life. It is an internal, subjective search that transcends biological, psychological, and social dimensions and is characterized by a profound integration with life and the world, regardless of membership in a specific religious organization. Religiosity refers to the participation and practice of rituals, beliefs, and values within a religious organization or community. It includes the adherence to doctrines and the performance of external and objective social practices connecting the individual to a higher being, through the structure and norms of a specific religious group (Oñate et al., 2015).	Treatment Spirituality / Religiosity Scale (TSRS) (Gonçalves et al., 2016); Multidimensional Inventory for Religious/ Spiritual Well-Being (MI-RSWB) (Berger et al., 2016); Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS) (Vespa et al., 2017; Oñate et al., 2015); *Índice Breve de Religiosidad y Espiritualidad* (Gallardo-Peralta et al., 2018)from the Multidimensional Brief Measure of Religiousness/Spirituality (BMMRS; *Escala Trifactorial de Espiritualidad* (Díaz-Castillo et al., 2021); System of Belief Inventory (Erci, & Aktürk, 2018)
Spiritual or religious experiences	Specific feelings, transcendental growth processes, and effects that occur in individuals at times. These may reflect individual beliefs and attitudes related to transcendence, and cultural, ethnic, and/or religious influences (Soósová & Mauer, 2021). It also includes states and conditions of consciousness that imply the liberation of suffering, according to various cultural and religious traditions. These experiences, especially when focused on spiritual enlightenment, are characterized by a conscious recognition of the ultimate truth, the reality that all is empty and requires no attachment, and the realization of the absence of a true self. These experiences include elements such as the renunciation of desires and attachments through the cultivation of spiritual wisdom and introspection (Wang et al., 2022).	Daily Spiritual Experiences Scale (DSES) (Saffari et al., 2017; Soósová & Mauer, 2021); Chinese DSES-C (Lo et al., 2016); Italian DSES-IT (Yepes Martinez et al., 2023); Spiritual Enlightenment Experience Scale (SEES) (Wang et al., 2022)

Table 2
Constructs related to spirituality and its validated scales (continued)

Constructs related to spirituality	*Definition*	*Validated scales*
Expressions of spirituality	Expressions of spirituality refer to the manifestations and ways in which spirituality is expressed and can be evaluated in individuals, being a multidimensional approach (Proyer & Laub, 2017).	Expressions of Spirituality Inventory-Revised (ESI-R) (Proyer & Laub, 2017)
Spiritual intelligence	Mental skills that address existential, transcendental, and conscious questions of the human condition and its connection with the universe. Spiritual intelligence leads to awareness, integration, and adaptation of immaterial and transcendent aspects of human existence. It focuses on reflection on the meaning and purpose of life, as well as the search for answers to great existential questions (Becerra Canales & Becerra Huaman, 2020).	*Escala de inteligencia espiritual en la práctica sanitaria (EIEps)* (Becerra Canales & Becerra Huaman, 2020) *Spiritual Intelligence Scale-Chinese Form* (Feng et al., 19)-
Spiritual needs	Requirements related to the spirituality of patients, particularly in the context of older people with chronic diseases. Spiritual needs include aspects such as the search for meaning, reflection on the meaning of life and death, the need for inner peace, forgiveness, and generativity (Moeini et al., 2018) Needs and expectations of a person to find goals, commitment, and values in life, regardless of whether the person has religious beliefs. These include the search for love, hope/power, and the meaning or purpose of life (Zhao et al., 2019).	Spiritual Needs Questionnaire (SpNQ) ((Moeini et al., 2018); Chinese version SpNQ-Ch-27 (Zhao et al., 2019); Spiritual Care Needs Inventory (SCNI) (Wu et al., 2016); Chinese Version of Spiritual Interests Related Illness Tool (C-SpIRIT) (Lin et al., 2015)
Spiritual health	Spiritual health refers to the dynamic state of being, which reflects the quality of relationships in the personal, community, environmental, and transcendental spheres people maintain when they have spiritual well-being (Elhai et al., 2018)will to live, and participant's health perception and by negative association with depressive symptoms and fear of dying.\nCONCLUSION: These findings suggest that responses to the Hebrew version of the SHALOM questionnaire are valid and reliable, and can be used as an efficient tool for evaluation of spiritual well-being (Elhai et al., 2018)	SHALOM Spiritual Questionnaire (Elhai et al., 2018)
Feelings of abandonment by God	A common subjective experience among religious people in that, despite believing in the presence of God, individuals feel that God has temporarily abandoned them. This feeling is not necessarily linked to personal sins or negligence and could arise without clear reasons. It is often associated with the normal process of spiritual and religious development and could represent one of the greatest tests of faith (Głaz, 2021).	Scale of Abandonment by God (SAG) (Głaz, 2021)
Spirituality- Spiritual transcendence	Innate motivation to guide behavior in the effort to build a deeper meaning for life from an eschatological perspective. Spiritual transcendence focuses on the individual and their connection to a larger reality (Simkin, 2017).	*Escala de evaluación de espiritualidad y sentimientos religiosos* (ASPIRES) (Simkin, 2017)

al., 2021; Riveros et al., 2018), spiritual grief (Burke et al., 2013, 2021), spiritual and/or religious expressions (Proyer & Laub, 2017), spiritual intelligence (Becerra Canales & Becerra Huaman, 2020; Feng et al., 2019), feelings of abandonment by God (Głaz, 2021), and spiritual transcendence (Simkin, 2017).

Of the 22 concepts related to spirituality, four were found to lack clear operational definitions in the psychometric studies reviewed. Most of these studies presented multiple theoretical definitions of spirituality and religiosity, highlighting both the differences between constructs and their shared defining characteristics. However, many of these studies lacked a precise definition of the phenomenon they aimed to measure using a solid theoretical or empirical reference, revealing a possible conceptual confusion between the construct of spirituality and emerging concepts such as spiritual and religious attitudes, spiritual support, spiritual comfort and religious beliefs.

We identified three concepts that might seem similar: spiritual distress, spiritual pain, and feelings of abandonment by God. While the definition of these concepts suggests that people may experience a loss in their relationship with God or a transpersonal disconnection at some point, they are distinguished by their conceptual boundaries. Spiritual pain is linked to grief, whereas spiritual distress focuses on an internal conflict related to beliefs and values. Conversely, feelings of abandonment by God refer to the perception of a temporary separation from God for no clear reason. However, this feeling is part of the process of spiritual growth.

Although most of the concepts are understandable, most of the definitions found in psychometric studies are not consistent with the dimensions of the instruments used. Moreover, in many studies involving the translation and cultural adaptation of instruments to measure spirituality, the researcher's original definition of the instrument was not clarified, making it difficult to conduct an exhaustive analysis of the validity of the construct in these contexts.

Validity and Reliability of the Instruments or scales for the Assessment of Spirituality

The populations in which the instruments were validated were primarily adults of all ages (Burke et al., 2021; Elhai et al., 2018; Feng et al., 2019; Gallegos et al., 2021; González-Rivera & Pagán-Torres, 2018; González-Rivera, Quintero-Jiménez, et al., 2017; González-Rivera, Veray-Alicea, et al., 2017; Lin et al., 2015; Lundman et al., 2015; Oñate et al., 2015; Pena-Gayo et al., 2018; Proyer & Laub, 2017; Roof et al., 2017; Tomás & Rosa, 2021; Wang et al., 2022; Watts et al., 2022; Wu et al., 2016), healthcare professionals (Becerra-Partida et al., 2019; Pastrana et al., 2021) such as nurses (Adib-Hajbaghery & Zehtabchi, 2016; Deluga et al., 2020; Hu et al., 2019; Kang et al., 2022; Pais et al., 2022), university students (Berger et al., 2016; Głaz, 2021; González-Rivera & Pagán-Torres, 2018; Guilherme et al., 2020; Makkar & Singh, 2021; Nawafleh et al., 2018; Riveros et al., 2018; Simkin et al., 2017) , nursing students (Fopka-Kowalczyk et al., 2023; Gonçalves et al., 2016; Guilherme et al., 2020; İpek Çoban et al., 2017), and people diagnosed with cancer (Erci & Aktürk, 2018; Lo et al., 2016; Martins et al., 2021; Pinto et al., 2016; Schiappacasse Cocio & González Soto, 2016; Simão et al., 2016; Xie et al., 2019; Zhao et al., 2021).

Of all the studies reviewed, only 11% (n = 7) measured content validity with a panel of experts (Adib-Hajbaghery & Zehtabchi, 2016; Gallegos et al., 2021; Guilherme et al., 2020; Hu et al., 2019; Wu et al., 2013; Xie et al., 2019), usually comprising nurses, theologians, psychologists, and priests. The number of experts ranged from five to 20.

Ninety-seven per cent of the studies reviewed (n = 61) measured construct validity using exploratory factor analysis, confirmatory factor analysis, or model fit indices, as shown in Table 3. Convergent construct validity was only measured in one instrument (Schiappacasse Cocio & González Soto, 2016).

Among the instruments with construct validity testing, we found an average of three factors, ranging from one to six, with an average of 61% of total explained variance, ranging from 42.3% to 95.9%. Of the instruments, 84.3% (n = 54) reported overall reliability using Cronbach's alpha, with a range of 0.71 to 0.98.

DISCUSSION AND CONCLUSION

Main results

This review identified 64 research studies assessing spirituality from different theoretical and philosophical points of view and perspectives, including those specific to a particular population. The various constructs that can arise from spirituality or deal with the spiritual dimension of a human being are usually extremely abstract and often difficult to understand due to the nature of the phenomenon (Fuentes, 2018). Some characteristics theorists have identified about spirituality should be highlighted, such as the fact that it is subjective and individual and develops differently in each person (Sarrazin Martínez, 2021).

This level of abstraction of the phenomenon gives it interpretive richness, enabling it to be evaluated from multiple theoretical perspectives. Among the psychometric studies, three approaches were identified in the definitions of spirituality or an emerging concept of this phenomenon. The first is a homocentric approach, where humans connect and relate to their environment, finding purpose or meaning in their lives through these connections. The second is a theocentric approach, in which humans establish a relationship

Table 3
Validity and reliability of measurement instruments

Authors/year	*Content validity*	*Construct validity*	*Factors*	*Variance explained*	*Criterion validity*	*Overall reliability*
Adib-Hajbaghery & Zehtabchi, 2016	X	-	-	-	-	α: 0.91
Agli et al., 2017	-	X	3	-	-	α: 0.84
Ahmad et al., 2022	-	X	3	74.2%	-	α: 0.78
Becerra Canales & Becerra Huaman, 2020	-	X	3	54%	-	α: 0.9
Benito et al., 2014	-	X	3	-	X	α: 0.72
Berger et al., 2016	-	X	6	58.9%	-	α: 0.91
Burke et al., 2014	-	X	2	-	-	-
Burke et al., 2021	-	X	3	-	-	α: 0.96
Büssing et al., 2016	-	X	3	-	-	-
Schiappacasse Cocio & González Soto, 2016	-	X	-	-	-	α: 0.91
Daaleman et al., 2014	-	X	2	61%	-	α: 0.87
Deluga et al., 2020	-	X	6	67.9%	-	α: 0.7
Deng et al., 2021	-	X	2 - 3	-	-	α: 0.91
Pais et al., 2022	-	X	3	-	-	α: 0.9
Díaz-Castillo et al., 2021	-	X	3	59.2%	-	α: 0.93
Elhai et al., 2018	-	X	4	69%	-	-
Erci & Aktürk, 2018	-	X	2	60.8%	-	α: 0.98
Feng et al., 2019	-	X	3	52.1%	-	α: 0.85
Feng et al., 2021	-	X	4	55%	-	α: 0.93
Fopka et al., 2023	-	X	5	48%	-	α: 0.88
Gallardo-Peralta et al., 2018	-	X	2	-	-	α: 0.92
Gallegos et al., 2021	X	X	2	-	-	-
Głaz, 2021	-	X	1	47.8%	-	α: 0.89
Gonçalves et al., 2016	-	X	2	-	-	α: 0.85
González-Rivera, Veray-Alicea, et al., 2017	-	X	3	67.%	-	α: 0.84
González-Rivera, Quintero-Jiménez et al., 2017	-	X	3	72.8%	-	α: 0.92
González-Rivera et al., 2018	-	X	3	-	-	α: 0.88
González-Rivera & Pagán-Torres, 2018	-	X	2	-	-	α: 0.95
Guilherme et al., 2020	X	X	6	61.2%	-	α: 0.89
İpek Çoban et al., 2017	-	X	5	63.6%	-	α: 0.96
Hu et al., 2019	X	X	4	53.1%	X	α: > 0.7
Kabakci et al., 2022	-	X	5	69%	-	α: 0.92

Table 3
Validity and reliability of measurement instruments (continued)

Authors/year	*Content validity*	*Construct validity*	*Factors*	*Variance explained*	*Criterion validity*	*Overall reliability*
Kang et al., 2022	-	*X*	3	69.4%	-	*α*: 0.95
Levine et al., 2015	-	*X*	4	-	-	-
Ling et al., 2015	-	*X*	5	50.4%	*X*	*α*: 0.88
Lo et al., 2016	-	*X*	2	57%	-	*α*: 0.94
Lundman et al., 2015	-	*X*	2	-	*X*	*α*: 0.83
Makkar & Singh, 2021	-	*X*	5	66.4%	-	*α*: 0.94
Martins et al., 2021	-	*X*	1	74.3%	-	*α*: 0.89
Moeini et al., 2018	-	*X*	5	60%	-	*α*: 0.82
Nawafleh et al., 2018	-	*X*	4	95.9%	-	*α*: 0.92
Nooripour et al., 2023	-	*X*	4	61%	-	*α*: 0.71
Pinto et al., 2016	-	*X*	5	57.3%	-	*α*: 0.84
Oñate et al., 2015	-	*X*	1	61%	-	*α*: 0.92
Pastrana et al., 2021	-	*X*	6	67%	-	*α*: 0.92
Pena-Gayo et al., 2018	*X*	*X*	3	42.3%	-	*α*: 0.89
Proyer & Laub, 2017	-	*X*	5	65.6%	-	-
Rabitti et al., 2020	-	*X*	3	55%	-	*α*: 0.79
Riveros et al., 2018	-	*X*	2	59.7%	-	*α*: 0.92
Roof et al., 2017	-	*X*	4	85.2%	-	*α*: 0.94
Saffari et al., 2017	-	*X*	3	59%	*X*	*α*: 0.9
Simão et al., 2016	-	*X*	3	-	-	*α*: 0.73
Simkin, 2017	-	*X*	2 – 3 c/ subscale	-	-	-
Soósová et al., 2021	-	*X*	1	75.8%	*X*	*α*: 0.98
Tomás & Rosa, 2021	-	*X*	2	69%	-	-
Vespa et al., 2017	-	*X*	2	72%	-	-
Wan et al., 2022	-	*X*	3	63%	-	*α*: 0.93
Watts et al., 2022	-	*X*	3	50%	*X*	*α*: 0.86
Weathers et al., 2020	-	*X*	5	56.3%	-	*α*: 0.9
White & Schim, 2013	-	*X*	4	47%	*X*	*α*: 0.91
Wu et al., 2016	*X*	*X*	2	66.2%	-	-
Xie et al., 2019	*X*	*X*	3	65.2%	-	*α*: 0.88
Yepes et al., 2023	-	*X*	2	60.3%	-	*α*: 0.93
Zhao et al., 2019	-	*X*	6	63%	-	*α*: 0.9

Symbols: *X* indicates the type of validity testing used for each instrument; *α*, Cronbach's alpha.

with God, a higher power, or a mystical element, finding fulfillment and their life's purpose in it. The third is a mixed vision, which does not separate the different connections humans establish. All these approaches enable humans to transcend their lives. These findings were expected given the nature of the phenomenon, since spirituality favors a connection with the variables of the being at an intrapersonal, interpersonal, and transpersonal level (Fuentes, 2018; López-Tarrida et al., 2020), which in turn leads the person to transcend (Reed, 2018, 2021).

Spiritual needs are one of the constructs enabling us to assess spirituality in people who are ill. Identifying spiritual needs can be helpful in healthcare practice. It is because it facilitates the identification of challenges in religious or intra- and intrapersonal practices that it can be useful for hospitalized people or those with health problems (Morales-Ramón & Ojeda-Vargas, 2014; Pérez-García, 2016). However, nursing practice would be limited if only spiritual needs of a religious nature were addressed (Morales-Ramón & Ojeda-Vargas, 2014; Muñoz Devesa et al., 2014).

Among the multiple constructs of spirituality, religious practices or rituals and theocentric belief systems are part of the transpersonal dimension of spirituality in believers. Although these two constructs closely related in some ways, they are theoretically quite different (Sarrazin Martínez, 2021). Instruments assessing religiosity as part of spirituality are therefore useful for religious populations.

A total of 54 different instruments assessed spirituality from multiple components, theories, and philosophical perspectives. This could be because spiritual care is becoming increasingly requested at institutions due to the implementation of human caring models in clinical practice (Soto-Rubio et al., 2020). Nurses and other health professionals are therefore becoming more aware and knowledgeable about this phenomenon, as reported by (Sarrazin Martínez, 2021).

However, in several of the instruments found, there is evidence of a lack of conceptual clarity in the constructs assessed, making it difficult to understand the empirical indicators. This can also be observed in the similarity of items found in instruments assessing spirituality from different constructs.

Given the nature of the phenomenon, a lack of conceptual clarity is common in studies conducted since the 1990s. A previous review on spirituality questionnaires, conducted by de Jager Meezenbroek et al. (2012), reported that the items in the questionnaires analyzed were not as clear or appropriate for practice. Therefore, although numerous scales, inventories, and instruments exist to measure spirituality, exploring, assessing, and approaching spirituality in clinical practice is complex (López-Tarrida et al., 2020), especially when the constructs in the instruments are unclear.

Waltz et al. (2017) suggest that the first step a researcher should take when designing instruments, is conceptual operationalization, in which attributes, characteristics and dimensions are defined to distinguish the concept being assessed from others that could be considered synonyms. Conceptual inaccuracy has been one of the most common flaws in instruments assessing attributes of spirituality. This could be due to the lack of fit between the dimensions of the instruments and the conceptual definition of the phenomenon that is to be measured. It was clear from most psychometric studies that the conceptual definition was not consistent with the instrument or its dimensions. Although a conceptual definition of spirituality was given in the introduction section of many of the studies included in this review, the dimensions of the validated instrument were not known until the material and methods section. The defining characteristics enable concepts to be differentiated, thereby establishing a conceptual delimitation. These elements are known as dimensions or factors, and items are grouped according to these defining characteristics, dimensions, or factors, thereby measuring the concept intended to be evaluated (Waltz et al., 2017). The lack of a clear link between the conceptual definition and the dimensions of the instrument can therefore limit accuracy in measuring the phenomenon.

In this review, three types of validity (content, construct, and criterion) were measured for the Spiritual Caregiving Scale (Hu et al., 2019), and only seven studies measured content validity. Content validity is a logical judgment attempting to determine whether items reflect the content domain being measured by assessing clarity, coherence, relevance, and (Urrutia Egaña et al., 2014).

Construct validity was the most frequently reported aspect in the measurement instruments reviewed. A total of 73% of the studies used Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure to verify sampling adequacy for factor analysis. The KMO test shows the degree to which each variable can be predicted by the other variables. This statistic must be calculated before running the correlation matrices for factor analysis, and the criterion that KMO must be equal to or greater than 0.8 must be met (Pizarro Romero & Martínez Mora, 2020).

Bartlett's test of sphericity indicates whether a correlation matrix is suitable for factor analysis, for which it must be <0.5 (López-Aguado & Gutiérrez-Provecho, 2019). Factor analysis can then be performed. The grouping of items into factors in the pilot test confirms the concept or construct being measured by empirically dividing these groupings into dimensions (Lloret-Segura et al., 2014). To ensure accurate assessment, it is essential to clearly define the unique qualities and characteristics that differentiate the concept from others.

Certain aspects must be considered for an adequate interpretation of our results. Although our systematic search to identify the articles included in this review was not restricted by geographic region or language of publication, we cannot guarantee that we have managed to retrieve all the manuscripts on the psychometric properties of instruments evaluated spirituality, which is a limitation of this type of studies.

Despite this limitation, advantages of the present review include the fact that we searched for studies in six different electronic databases, enabling us to summarize the available evidence on the topic of interest from a larger number of studies than previous reviews. Moreover, unlike other reviews, we included information on instruments to assess spirituality among different population groups. Furthermore, researchers read and evaluated the articles to ensure an appropriate and scientifically rigorous selection, and the evaluation was conducted in phases.

In conclusion, since spirituality can be measured from multiple perspectives, concepts, and theoretical points of reference, numerous constructs have been created. Although the level of conceptual abstraction of this phenomenon provides a richness of interpretation, in practice this can cause confusion.

The need for greater clarity in certain constructs in spirituality scales is evinced by the similarity of items across instruments. There is often a lack of clarity between the conceptual operationalization and wording of the categories and empirical indicators.

Most of the studies included in this review only measured the construct validity of instruments to assess spirituality, ignoring content and criterion validity. The absence of holistic validation could restrict the precision and applicability of the measurements made, thus limiting their usefulness in various research contexts or practical applications.

The reliability of the measurement instruments analyzed in this review ranged from 0.7 to 0.98. This wide range of reliability indicates sharp differences in the consistency and stability of the measurements obtained through these instruments. Despite the variability, it is important to note that most instruments demonstrate levels of reliability that can be considered acceptable in terms of internal consistency and reproducibility of results. However, it should be noted that reliability alone does not guarantee the validity of measurements, as precision and consistency may not necessarily determine the accuracy of what is being measured.

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Conflict of interest

The authors declare they have no conflicts of interest.

REFERENCES

Adib-Hajbaghery, M., & Zehtabchi, S. (2016). Developing and Validating an Instrument to Assess the Nurses' Professional Competence in Spiritual Care. *Journal of Nursing Measurement, 24*(1), 15-27. https://doi.org/10.1891/1061-3749.24.1.15

Agli, O., Bailly, N., & Ferrand, C. (2017). Validation of the Functional Assessment of Chronic Illness Therapy—Spiritual Well-being (FACIT-Sp12) on French Old People. *Journal of Religion and Health, 56*(2), 464-476. https://doi.org/10.1007/s10943-016-0220-0

Ahmad, N., Sinaii, N., Panahi, S., Bagereka, P., Serna-Tamayo, C., Shnayder, S., Ameli, R., & Berger, A. (2022). The FACIT-Sp spiritual wellbeing scale: a factor analysis in patients with severe and/or life-limiting medical illnesses. *Annals of Palliative Medicine, 11*(12), 3663-3673. https://doi.org/10.21037/apm-22-692

Becerra Canales, B., & Becerra Huaman, D. (2020). Diseño y validación de la escala de Inteligencia Espiritual en la práctica sanitaria, Ica-Perú. *Enfermería Global, 19*(4), 349-378. https://doi.org/10.6018/eglobal.417371

Becerra-Partida, E. N., Millán, R. M., & Arias, D. R. R. (2019). Depresión en pacientes con diabetes mellitus tipo 2 del programa DiabetIMSS en Guadalajara, Jalisco, México. *Revista CONAMED, 24*(4), 174–178. http://www.conamed.gob.mx/gobmx/revista/pdf/vol_23_2018/COMPLETO_4.pdf

Benito, E., Oliver, A., Galiana, L., Barreto, P., Pascual, A., Gomis, C., & Barbero, J. (2014). Development and Validation of a New Tool for the Assessment and Spiritual Care of Palliative Care Patients. *Journal of Pain and Symptom Management, 47*(6), 1008-1018.e1. https://doi.org/10.1016/j.jpainsymman.2013.06.018

Berger, D., Fink, A., Perez Gomez, M. M., Lewis, A., & Unterrainer, H. (2016). The Validation of a Spanish Version of the Multidimensional Inventory of Religious/Spiritual Well-Being in Mexican College Students. *The Spanish Journal of Psychology, 19*, https://doi.org/10.1017/sjp.2016.9

Burke, L. A., Crunk, A. E., Neimeyer, R. A., & Bai, H. (2021). Inventory of Complicated Spiritual Grief 2.0 (ICSG 2.0): Validation of a revised measure of spiritual distress in bereavement. *Death Studies, 45*(4), 249-265. https://doi.org/10.1080/07481187.2019.1627031

Burke, L. A., Neimeyer, R. A., Holland, J. M., Dennard, S., Oliver, L., & Shear, M. K. (2013). Inventory of Complicated Spiritual Grief: Development and Validation of a New Measure. *Death Studies, 38*(4), 239–250. https://doi.org/10.1080/07481187.2013.810098

Büssing, A., Franczak, K., & Surzykiewicz, J. (2016). Spiritual and Religious Attitudes in Dealing with Illness in Polish Patients with Chronic Diseases: Validation of the Polish Version of the SpREUK Questionnaire. *Journal of Religion and Health, 55*(1), 67–84. https://doi.org/10.1007/s10943-014-9967-3

Caccia, P., & Elgier, M. (2020). Resiliencia y satisfacción con la vida en adolescentes según nivel de espiritualidad. *PSOCIAL; 6*(2), 62–70. https://publicaciones.sociales.uba.ar/index.php/psicologiasocial/article/view/5975

Daaleman, T. P., Reed, D., Cohen, L. W., & Zimmerman, S. (2014). Development and Preliminary Testing of the Quality of Spiritual Care Scale. *Journal of Pain and Symptom Management, 47*(4), 793-800. https://doi.org/10.1016/j.jpainsymman.2013.06.004

de Diego-Cordero, R., Suárez-Reina, P., Badanta, B., Lucchetti, G., & Vega-Escaño, J. (2022). The efficacy of religious and spiritual interventions in nursing care to promote mental, physical and spiritual health: A systematic review and meta-analysis. *Applied Nursing Research, 67,* 151618. https://doi.org/10.1016/j.apnr.2022.151618

de Jager Meezenbroek, E., Garssen, B., van den Berg, M., van Dierendonck, D., Visser, A., & Schaufeli, W. B. (2012). Measuring Spirituality as a Universal Human Experience: A Review of Spirituality Questionnaires. *Journal of Religion and Health, 51*(2), 336-354. https://doi.org/10.1007/s10943-010-9376-1

Deluga, A., Dobrowolska, B., Jurek, K., Ślusarska, B., Nowicki, G., & Palese, A. (2020). Nurses' spiritual attitudes and involvement—Validation of the Polish version of the Spiritual Attitude and Involvement List. *PLOS ONE, 15*(9), e0239068. https://doi.org/10.1371/journal.pone.0239068

Deng, L. R., Masters, K. S., Schmiege, S. J., Hess, E., & Bekelman, D. B. (2021). Two Factor Structures Possible for the FACIT-Sp in Patients With Heart Failure. *Journal of Pain and Symptom Management, 62*(5), 1034-1040. https://doi.org/10.1016/j.jpainsymman.2021.05.009

Díaz-Castillo, R., Montero-López Lena, M., González-Escobar, S., & González-Arratia López Fuente, N. I. (2021). Desarrollo y validación de la Escala Trifactorial de Espiritualidad en personas adultas mayores mexicanas. *Neurama, 8*(1), 39–52. https://www.neurama.es/articulos/15/articulo4.pdf

Elhai, N., Carmel, S., O'Rourke, N., & Bachner, Y. G. (2018). Translation and validation of the Hebrew version of the SHALOM Spiritual questionnaire. *Aging & Mental Health, 22*(1), 46–52. https://doi.org/10.1080/13607863.2016.1222350

Epstein, J., Santo, R. M., & Guillemin, F. (2015). A review of guidelines for cross-cultural adaptation of questionnaires could not bring out a consensus. *Journal of Clinical Epidemiology, 68*(4), 435-441. https://doi.org/10.1016/j.jclinepi.2014.11.021

Erci, B., & Aktürk, Ü. (2018). The System of Belief Inventory: A Validation Study in Turkish Cancer Patients. *Journal of religion and health, 57*(4), 1237-1245. https://doi.org/10.1007/s10943-017-0406-0

Feng, J., Li, Y., Sun, Y., Wang, L., Qi, W., Wang, K. T., & Xue, Y. (2021). The Chinese Spiritual Coping Scale: Development and Initial Psychometric Evaluation. *Journal of religion and health, 60*(1), 458–474. https://doi.org/10.1007/s10943-019-00970-z

Feng, M., Xiong, X.-y., & Li, J.-j. (2019). Spiritual Intelligence Scale--Chinese form: Construction and initial validation. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 38*(5), 1318–1327. https://doi.org/10.1007/s12144-017-9678-5

Fopka-Kowalczyk, M., Best, M., & Krajnik, M. (2023). The Spiritual Supporter Scale as a New Tool for Assessing Spiritual Care Competencies in Professionals: Design, Validation, and Psychometric Evaluation. *Journal of religion and health, 62*(3), 2081–2111. https://doi.org/10.1007/s10943-022-01608-3

Fuentes, L. del C. (2018). La Religiosidad y la Espiritualidad ¿Son conceptos teóricos independientes? *Revista de Psicología, 14*(28), 109-119. https://erevistas.uca.edu.ar/index.php/RPSI/article/view/1742

Gallardo-Peralta, L. P., Cuadra-Peralta, A., & Veloso-Besio, C. (2018). Validación de un Índice Breve de Religiosidad y Espiritualidad en personas mayores. *Revista de Psicología, 27*(1), 1. https://doi.org/10.5354/0719-0581.2018.50736

Gallegos, W. L. A., Loayza, A. E., Rivera, R., & Cohello, A. L. N. (2021). Modified and Validated Version of the System of Beliefs Inventory (SBI-15R) in a Sample of Inhabitants from Arequipa City (Peru). *International Journal of Latin American Religions, 5*(2), 501-518. https://doi.org/10.1007/s41603-021-00139-1

González-Rivera, J. A., & Pagán-Torres, O. M. (2018). Desarrollo y Validación de un instrumento para medir Estrategias de Afrontamiento Religioso. *Revista Evaluar, 18*(1), 70-86. https://doi.org/10.35670/1667-4545.v18.n1.19771

González-Rivera, J. A., Quintero-Jiménez, N., Veray-Alicea, J., & Rosario-Rodríguez, A. (2017). Adaptación y validación de la escala de espiritualidad de delaney en una muestra de adultos puertorriqueños. *Revista Electrónica de Psicología Iztacala, 20*(1). https://www.revistas.unam.mx/index.php/repi/article/view/58935

González-Rivera, J. A., Veray-Alicea, J., & Rosario-Rodríguez, A. (2017). Desarrollo, validación y descripción teórica de la escala de espiritualidad personal en una muestra de adultos en Puerto Rico. *Revista Puertorriqueña de Psicología, 28*(2), 388-404.

González-Rivera, J., Rosario-Rodríguez, A., & Pagán-Torres, O. (2018). Confirmatory Factorial Analysis of the Personal Spirituality Scale in Puerto Ricans Adults Interacciones. *Interacciones, 4*(3), 153-162. https://doi.org/10.24016/2018.v4n3.101

Gonçalves, A. M. D. S., Santos, M. A. D., Chaves, E. D. C. L., & Pillon, S. C. (2016). Adaptação transcultural e validação da versão brasileira da Treatment Spirituality / Religiosity Scale. *Revista Brasileira de Enfermagem, 69*(2), 235-241. https://doi.org/10.1590/0034-7167.2016690205i

Guilherme, C., Fulquini, F., Ribeiro, V., Gadioli, B., Eduardo, A., Caldeira, S., & Carvalho, E. (2020). Validity evidenceofthe spiritual care competence scale for brazilian undergraduate nursing students. *Reme: Revista Mineira de Enfermagem, 24*(1), e-1343. https://doi.org/10.5935/1415.2762.20200080

Głaz, S. (2021). Psychological Analysis of Religiosity and Spirituality: Construction of the Scale of Abandonment by God (SAG). *Journal of Religion and Health, 60*(5), 3545–3561. https://doi.org/10.1007/s10943-021-01197-7

Herdman, M., Fox-Rushby, J., & Badia, X. (1998). A model of equivalence in the cultural adaptation of HRQoL instruments: the universalist approach. *Quality of life research : an international journal of quality of life aspects of treatment, care and rehabilitation, 7*(4), 323-335. https://doi.org/10.1023/a:1024985930536

Hu, Y., Tiew, L. H., & Li, F. (2019). Psychometric properties of the Chinese version of the spiritual care-giving scale (C-SCGS) in nursing practice. *BMC Medical Research Methodology, 19*(1), 21. https://doi.org/10.1186/s12874-019-0662-7

İpek Çoban, G., Şirin, M., & Yurttaş, A. (2017). Reliability and Validity of the Spiritual Care-Giving Scale in a Turkish Population. *Journal of Religion and Health, 56*(1), 63-73. https://doi.org/10.1007/s10943-015-0086-6

Kabakci, E. N., & Çelik, N. (2022). Adaptation into Turkish and evaluation of the psychometric properties of the Spiritual Care Competence Scale. *Central European Journal of Nursing and Midwifery, 13*(2), 648-656. https://doi.org/10.15452/cejnm.2022.13.0001

Kang, K. A., Taylor, E. J., & Chun, J. (2022). Nurse Spiritual Care Therapeutics Scale: Validation Among Nurses Who Care for Patients With Life-Threatening Illnesses in South Korea. *Journal of hospice and palliative nursing*, https://doi.org/10.1097/NJH.0000000000000895. Advance online publication. https://doi.org/10.1097/NJH.0000000000000895

Levine, E. G., Vong, S., & Yoo, G. J. (2015). Development and Initial Validation of a Spiritual Support Subscale for the MOS Social Support Survey. *Journal of Religion and Health, 54*(6), 2355-2366. https://doi.org/10.1007/s10943-015-0005-x

Lin, Y. L., Rau, K. M., Liu, Y. H., Lin, Y. H., Ying, J., & Kao, C. C. (2015). Development and validation of the Chinese Version of Spiritual Interests Related Illness Tool for patients with cancer in Taiwan. *European journal of oncology nursing, 19*(5), 589-594. https://doi.org/10.1016/j.ejon.2015.03.005

Lloret-Segura, Susana, Ferreres-Traver, Adoración, Hernández-Baeza, Ana, & Tomás-Marco, Inés. (2014). El Análisis Factorial Exploratorio de los Ítems: una guía práctica, revisada y actualizada. *Anales de Psicología, 30*(3), 1151-1169. https://dx.doi.org/10.6018/analesps.30.3.199361

Lo, G., Chen, J., Wasser, T., Portenoy, R., & Dhingra, L. (2016). Initial Validation of the Daily Spiritual Experiences Scale in Chinese Immigrants With Cancer Pain. *Journal of Pain and Symptom Management, 51*(2), 284-291. https://doi.org/10.1016/j.jpainsymman.2015.10.002

López-Aguado, M., & Gutiérrez-Provecho, L. (2019). Cómo realizar e interpretar un análisis factorial exploratorio utilizando SPSS. *REIRE Revista d'Innovació i Recerca en Educació, 12*(2), https://doi.org/10.1344/reire2019.12.227057

López-Tarrida, Á. C, Ruiz-Romero, V., & González-Martín, T. (2020). Cuidando con sentido: la atención de lo espiritual en la práctica clínica desde la perspectiva del profesional. *Revista Española de Salud Pública, 94*, 202001002. Recuperado en 08 de enero de 2025, de http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1135-57272020000100083&lng=es&tlng=es.

Lundman, B., Årestedt, K., Norberg, A., Norberg, C., Fischer, R. S., & Lövheim, H. (2015). Psychometric Properties of the Swedish Version of the Self-Transcendence Scale Among Very Old People. *Journal of Nursing Measurement, 23*(1), 96-111. https://doi.org/10.1891/1061-3749.23.1.96

Makkar, S., & Singh, A. K. (2021). Development of a spirituality measurement scale. *Current Psychology, 40*(3), 1490-1497. https://doi.org/10.1007/s12144-018-0081-7

Martins, H., Caldeira, S., Domingues, T., Vieira, M., & Koenig, H. (2021). Validation of the Duke University Religion Index (DUREL) in Portuguese Cancer Patients Undergoing Chemoterapy. *Journal of Religion and Health, 60*(5), 3562-3575. https://doi.org/10.1007/s10943-020-01143-z

Moeini, B., Zamanian, H., Taheri-Kharameh, Z., Ramezani, T., Saati-Asr, M., Hajrahimian, M., & Amini-Tehrani, M. (2018). Translation and Psychometric Testing of the Persian Version of the Spiritual Needs Questionnaire Among Elders With Chronic Diseases. *Journal of Pain and Symptom Management, 55*(1), 94-100. https://doi.org/10.1016/j.jpainsymman.2017.08.024

Mokkink, L. B., de Vet, H. C. W., Prinsen, C. A. C., Patrick, D. L., Alonso, J., Bouter, L. M., & Terwee, C. B. (2018). COSMIN Risk of Bias checklist for systematic reviews of Patient-Reported Outcome Measures. *Quality of life research, 27*(5), 1171-1179. https://doi.org/10.1007/s11136-017-1765-4

Morales Contreras, B. N., & Palencia Sierra, J. J. (2021). Dimensión espiritual en el cuidado enfermero. *Enfermería Investiga, 6*(2), 51-59. https://doi.org/10.31243/ei.uta.v6i2.1073.2021

Morales-Ramón, F., & Ojeda-Vargas, M. G. (2014). El cuidado espiritual como una oportunidad de cuidado y trascendencia en la atención de enfermería. *Salud en Tabasco, 20*(3), 94-97.

Muñiz, J., & Fonseca-Pedrero, E. (2019). Diez pasos para la construcción de un test. P*sicothema, 1*(31), 7-16. https://doi.org/10.7334/psicothema2018.291

Muñoz Devesa, A., Morales Moreno, I., Bermejo Higuera, J. C., & Galán González Serna, J. M. (2014). *La Enfermería y los cuidados del sufrimiento espiritual. Index de Enfermería, 23*(3), 153-156. https://doi.org/10.4321/s1132-12962014000200008

Nawafleh, H. A., Al Hadid, L. A., Al Momani, M. M., & Al Barmawi, M. (2018). Measuring the psychometric properties of the Arabic version of the spirituality questionnaire among university students in South Jordan. *Applied Nursing Research, 39*, 115-120. https://doi.org/10.1016/j.apnr.2017.11.008

Nooripour, R., Ghanbari, N., Hosseinian, S., Ronzani, T. M., Hussain, A. J., Ilanloo, H., Majd, M. A., Soleimani, E., Saffarieh, M., & Yaghoob, V. (2023). Validation of the Spiritual Well-being Scale (SWBS) and its role in Predicting Hope among Iranian Elderly. *Ageing International, 48*(2), 593-611. https://doi-org.ugto.idm.oclc.org/10.1007/s12126-022-09492-8

Oñate, M. E., Resett, S., Sanabria, M. E., & MenghI, M. S. (2015). *Propiedades psicométricas de la dimensión espiritualidad de la evaluación multidimensional de la religiosidad y la espiritualidad, VII Congreso Internacional de Investigación y Práctica Profesional en Psicología XXII Jornadas de Investigación XI Encuentro de Investigadores en Psicología del MERCOSUR*. Facultad de Psicología, Universidad de Buenos Aires. https://www.aacademica.org/000-015/941.pdf

Pagán-Torres, O. M. (2022). Abriendo nuevas puertas: Relevancia clínica de integrar la religión y la espiritualidad en la disciplina de la psicología. *Revista Puertorriqueña de Psicología, 33*(2), 258–271. https://www.repsasppr.net/index.php/reps/article/view/761

Pais, N., Suresh, S., & DCunha, S. (2022). Spirituality and Spiritual Care in Nursing: Validity of the Spirituality and Spiritual Care Rating Scale in an Indian Context. *Journal of Religion and Health, 62*, 2131-2143. https://doi.org/10.1007/s10943-022-01634-1

Pastrana, T., Frick, E., Krikorian, A., Ascencio, L., Galeazzi, F., & Büssing, A. (2021). Translation and Validation of the Spanish Version of the Spiritual Care Competence Questionnaire (SCCQ). *Journal of Religion and Health, 60*(5), 3621-3639. https://doi.org/10.1007/s10943-021-01402-7

Pena-Gayo, A., González-Chordá, V. M., Cervera-Gasch, Á., & Mena-Tudela, D. (2018). Cross-cultural adaptation and validation of Pamela Reed's Self-Transcendence Scale for the Spanish context. *Revista Latino-Americana de Enfermagem, 26*, https://doi.org/10.1590/1518-8345.2750.3058

Pérez-García, E. (2016). Enfermería y necesidades espirituales en el paciente con enfermedad en etapa terminal. *Enfermería: Cuidados Humanizados, 5*(2), 41-45.

Pinto, S. M. O., Berenguer, S. M. A. C., Martins, J. C. A., & Kolcaba, K. (2016). Cultural adaptation and validation of the Portuguese End of Life Spiritual Comfort Questionnaire in Palliative Care patients. *Porto Biomedical Journal, 1*(4), 147-152. https://doi.org/10.1016/j.pbj.2016.08.003

Pizarro Romero, K. P., & Martínez Mora, O. M. (2020). Análisis factorial exploratorio mediante el uso de las medidas de adecuación muestral kmo y esfericidad de bartlett para determinar factores principales. *Journal of Science and Research, 5*, 903-924. https://doi.org/10.5281/zenodo.4453224

Proyer, R. T., & Laub, N. (2017). The German-Language Version of the Expressions of Spirituality Inventory-Revised: Adaptation and Initial Validation. *Current Psychology, 36*(1), 1-13. https://doi.org/10.1007/s12144-015-9379-x

Rabitti, E., Cavuto, S., Iani, L., Ottonelli, S., De Vincenzo, F., & Costantini, M. (2020). The assessment of spiritual well-being in cancer patients with advanced disease: which are its meaningful dimensions? *BMC Palliative Care, 19*(1), 26. https://doi.org/10.1186/s12904-020-0534-2

Reed, P. G. (2018). Theoryof self-transcendence. In: M. J. Smith, & P. Liehr (Eds.), *Middle Range Theory for Nursing*, 4th Edition, Vol. 3, pp. 119-145. Springer Publishing Company. https://doi.org/10.1891/9780826159922.0007

Reed, P. G. (2021). Self-Transcendence: Moving from Spiritual Disequilibrium to Well-Being Across the Cancer Trajectory. *Seminars in Oncology Nursing, 37*(5), 151212. https://doi.org/10.1016/j.soncn.2021.151212

Reed, P. G., & Haugan, G. (2021). Self-Transcendence: A Salutogenic Process for Well-Being. In: G. Haugan & M. Eriksson (Eds.), *Health Promotion in Health Care – Vital Theories and Research*. Springer. http://www.ncbi.nlm.nih.gov/books/NBK585654/

Riveros, F., Bernal, L., Bohórquez, D., Vinaccia, S., & Quiceno, M. (2018). Inventario de sistema de creencias (SBI-15 R) en Colombia: estructura factorial y confiabilidad en población universitaria y en pacientes crónicos. *Revista Colombiana de Enfermería, 17*, 13-20. https://doi.org/10.18270/rce.v17i13.2103

Roof, R. A., Bocarnea, M. C., & Winston, B. E. (2017). The spiritual engagement instrument. *Asian Journal of Business Ethics, 6*(2), 215-232. https://doi.org/10.1007/s13520-017-0073-y

Saffari, M., Amini, H., Sheykh-oliya, Z., Pakpour, A. H., & Koenig, H. G. (2017). Validation of the Persian version of the Daily Spiritual Experiences Scale (DSES) in Pregnant Women: A Proper Tool to Assess Spirituality Related to Mental Health. *Journal of Religion and Health, 56*(6), 2222-2236. https://doi.org/10.1007/s10943-017-0393-1

Sánchez-Villena, A. R., de La Fuente-Figuerola, V., & Ventura-León, J. (2021). Importancia de los estudios semánticos en la adaptación transcultural y validación de instrumentos de medida en Ciencias de la Salud. *Enfermería Clínica, 31*(2), 126-127. https://doi.org/10.1016/j.enfcli.2020.08.002

Sarrazin Martínez, J. P. (2021). La relación entre religión, espiritualidad y salud: una revisión crítica desde las ciencias sociales. *Hallazgos*, https://doi.org/10.15332/2422409x.5232

Schiappacasse Cocio, G., & González Soto, P. (2016). Validación del test Meaning in Life Scale (MILS) modificado para evaluar la dimensión espiritual en población chilena y latinoamericana con cáncer en cuidados paliativos. *Gaceta Mexicana de Oncología, 15*(3), 121-127. https://doi.org/10.1016/j.gamo.2016.05.004

Simão, T. P., Lopes Chaves, E.deC., Campos de Carvalho, E., Nogueira, D. A., Carvalho, C. C., Ku, Y. L., & Iunes, D. H. (2016). Cultural adaptation and analysis of the psychometric properties of the Brazilian version of the Spiritual Distress Scale. *Journal of clinical nursing, 25*(1-2), 231-239. https://doi.org/10.1111/jocn.13060

Simkin, H. (2017). Adaptación y Validación al español de la Escala de Evaluación de Espiritualidad y Sentimientos Religiosos (ASPIRES): la trascendencia espiritual en el modelo de los cinco factores. *Universitas Psychologica, 16*(2). https://doi.org/10.11144/javeriana.upsy16-2.aeee

Soósová, M. S., & Mauer, B. (2021). Psychometrics Properties of the Daily Spiritual Experience Scale in Slovak Elderly. *Journal of Religion and Health, 60*(1), 563-575. https://doi.org/10.1007/s10943-020-00994-w

Soto-Rubio, A., Perez-Marin, M., Rudilla, D., Galiana, L., Oliver, A., Fombuena, M., & Barreto, P. (2020). Responding to the Spiritual Needs of Palliative Care Patients: A Randomized Controlled Trial to Test the Effectiveness of the Kibo Therapeutic Interview. *Frontiers in Psychology, 11*. https://doi.org/10.3389/fpsyg.2020.01979

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53*(1), 80-93. https://doi.org/10.1037/0022-0167.53.1.80

Tomás, C., & Rosa, P. J. (2021). Validation of a Scale of Religious and Spiritual Coping (RCOPE) for the Portuguese Population. *Journal of religion and health, 60*(5), 3510-3529. https://doi.org/10.1007/s10943-021-01248-z

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., &Straus, S. E. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine, 169*(7), 467-473. https://doi.org/10.7326/m18-0850

Urrutia Egaña, M., Barrios Araya, S., Gutiérrez Núñez, M., & Mayorga Camus, M. (2014). Métodos óptimos para determinar validez de contenido. *Educación Médica Superior, 28*(3), 547-558. https://ems.sld.cu/index.php/ems/article/view/301

Vespa, A., Giulietti, M. V., Spatuzzi, R., Fabbietti, P., Meloni, C., Gattafoni, P., & Ottaviani, M. (2017). Validation of Brief Multidimensional Spirituality/Religiousness Inventory (BMMRS) in Italian Adult Participants and in Participants with Medical Diseases. *Journal of Religion and Health, 56*(3), 907-915. https://doi.org/10.1007/s10943-016-0285-9

Waltz, C., Strickland, O., & Lenz, E. (2017). *Measurement in Nursing and Health Research* (5th ed.). Springer Publishing Company, New York. https://www.springerpub.com/measurement-in-nursing-and-health-research-9780826170613.html

Wang, Q., Zhou, X., & Ng, S. (2022). The experiences of spiritual enlightenment: A mixed-method study of the development of a Spiritual Enlightenment Experience Scale. *Archive for the Psychology of Religion, 44*(3), 175-201. https://doi.org/10.1177/00846724221121686

Watts, R., Kettner, H., Geerts, D., Gandy, S., Kartner, L., Mertens, L., Timmermann, C., Nour, M. M., Kaelen, M., Nutt, D., Carhart-Harris, R., & Roseman, L. (2022). The Watts Connectedness Scale: a new scale for measuring a sense of connectedness to self, others, and world. *Psychopharmacology, 239*(11), 3461-3483. https://doi.org/10.1007/s00213-022-06187-5

Weathers, E., Coffey, A., McSherry, W., & McCarthy, G. (2020). Development and validation of the Spirituality Instrument-27© (SpI-27©) in individuals with chronic illness. *Applied Nursing Research, 56*, 151331. https://doi.org/10.1016/j.apnr.2020.151331

White, M. L., & Schim, S. M. (2013). Development of a Spiritual Self-Care Practice Scale. *Journal of Nursing Measurement, 21*(3), 450-462. https://doi.org/10.1891/1061-3749.21.3.450

Wu, H., Bertrand, K. A., Choi, A. L., Hu, F. B., Laden, F., Grandjean, P., & Sun, Q. (2013). Persistent Organic Pollutants and Type 2 Diabetes: A Prospective Analysis in the Nurses' Health Study and Meta-analysis. *Environmental Health Perspectives, 121*(2), 153-161. https://doi.org/10.1289/ehp.1205248

Wu, L., Koo, M., Liao, Y.-C., Chen, Y.-M., & Yeh, D.-C. (2016). Development and Validation of the Spiritual Care Needs Inventory for Acute Care Hospital Patients in Taiwan. *Clinical Nursing Research, 25*(6), 590-606. https://doi.org/10.1177/1054773815579609

Xie, H., Taylor, E. J., Li, M., Wang, Y., & Liang, T. (2019). Nurse Spiritual Therapeutics Scale: Psychometric evaluation among cancer patients. *Journal of Clinical Nursing, 28*(5-6), 939-946. https://doi.org/10.1111/jocn.14711

Yepes Martinez, M. V., Rossi, R., Ciani, M., & Ferrari, C. (2023). Validation of the Italian Version of the Daily Spiritual Experience Scale Among Psychiatric Patients. *Journal of Religion and Health, 62*(3), 2181-2195. https://doi.org/10.1007/s10943-022-01672-9

Zhao, G., Cheng, Q., Dong, X., & Xie, L. (2021). Mass hysteria attack rates in children and adolescents: a meta-analysis. *Journal of International Medical Research, 49*(12). https://doi.org/10.1177/03000605211039812

Zhao, Y., Wang, Y., Yao, X., Jiang, L., Hou, M., & Zhao, Q. (2019). Reliability and validity of the Chinese version of spiritual needs questionnaire with 27 items (SpNQ-Ch-27) in cancer patients. *International Journal of Nursing Sciences, 6*(2), 141-147. https://doi.org/10.1016/j.ijnss.2019.03.010

GUÍA PARA LOS AUTORES

La revista Salud Mental publica artículos originales sobre psiquiatría, psicología, neurociencias y disciplinas afines de acuerdo con los siguientes formatos:

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     • Los ensayos clínicos aleatorizados deben adecuarse a las guías *CONSORT* (http://www.consort-statement.org).
     • Los estudios con diseños no experimentales, a las guías *TREND* (http://www.trend-statement.org).
     • Los estudios transversales, de cohorte, y de casos y controles, a la guía *STROBE* (http://www.strobe-statement.org).
   - **Metodología cualitativa:** Incluye reportes de grupos focales, entrevistas a profundidad, redes semánticas y análisis de contenido. *Extensión máxima: 5000 palabras*.
     Deben cumplir con la guía *COREQ* (https://academic.oup.com/intqhc/article/19/6/349/1791966/Consolidated-criteria-for-reporting-qualitative).
3. **Artículos de revisión (sección revisada por pares)**
   - **Revisiones sistemáticas:** Preferentemente deben incluir un metaanálisis. *Extensión máxima: 4000 palabras*.
4. **Casos clínicos (sección revisada por pares)**
   Incluye reportes de efectos de un método diagnóstico o terapéutico que sea útil o relevante en el ámbito médico, académico o científico. *Extensión máxima: 2000 palabras.*
   Deben cumplir con la guía *CASE REPORT* (https://www.care-statement.org/checklist)

Nota: El conteo de palabras para cada una de estas secciones excluye el título, los resúmenes y las palabras clave, así como los apartados de financiamiento, conflictos de interés y agradecimientos; tampoco se consideran las palabras incluidas en tablas, figuras y referencias.

IDIOMAS
Salud Mental recibe y publica únicamente manuscritos en inglés.

ASPECTOS ÉTICOS EN LA PUBLICACIÓN
Vea los Lineamientos éticos en el sitio web de Salud Mental (www.revistasaludmental.gob.mx).

AUTORÍA
El número de autores dependerá del tipo de manuscrito enviado. Para artículos originales y artículos de revisión el número máximo de autores será de ocho. Solo cuando se trate de estudios multicéntricos el número máximo de autores será de doce, siempre y cuando se justifique de acuerdo con el alcance del estudio.

En caso de autoría colectiva, se incluirá el nombre de los redactores o responsables del trabajo seguido de «*y el grupo...»* cuando todos los miembros del grupo se consideren coautores del trabajo. Si se desea incluir el nombre del grupo, aunque no todos sus miembros sean considerados coautores, se mencionarán a los autores responsables seguido de *«en nombre del grupo...»* o *«por el grupo...»*. En cualquier caso, los nombres e instituciones de los miembros del grupo se incluirán en un anexo al final del manuscrito.

LINEAMIENTOS EDITORIALES
Es muy importante que los autores consideren los siguientes puntos antes de enviar sus manuscritos:

1. Los manuscritos deben redactarse de forma clara y concisa, sin errores de ortografía ni de sintaxis.
2. El texto debe estar escrito en formato Word, en fuente Times New Roman de 12 puntos, a doble espacio, con márgenes de 2.5 cm. y en tamaño carta.
3. Las páginas se numeran consecutivamente, empezando por la página del título y con el número escrito en la esquina superior derecha.
4. La primera página (donde se encuentra el título) debe contener los siguientes apartados en el orden que aquí se menciona:
   - **Título del trabajo en español y en inglés.** El título debe ser descriptivo e indicar los resultados principales del estudio. *Extensión máxima: 25 palabras*
   - **Título corto en español y en inglés.** *Extensión máxima: 6 palabras*.
   - **Nombre completo del autor y de los coautores.** Los autores deberán colocarse en listado; luego, en superíndice, deberá colocarse un número arábigo que indique la institución de adscripción.
   - **Número ORCID de los autores.** Es requisito que cada uno de los autores cuente con su número de identificación ORCID, el cual se puede conseguir en https://orcid.org/register
   - **Adscripción de los autores.** Se debe indicar con números arábigos y en superíndice. Las adscripciones se colocan inmediatamente después de los nombres de los autores (no como notas en pie de página). Es necesario que la adscripción especifique: departamento, área, institución, ciudad y país de cada autor. No es necesario indicar la dirección postal. Las instituciones deben escribirse en su idioma original, sin traducción. Si los autores añaden siglas, éstas deben pertenecer al nombre oficial. No se deben escribir cargos ni grados de los autores (doctor, residente, investigador, etc.).

     Ejemplo:

     Juan José García-Urbina,[1]

     Héctor Valentín Esquivias Zavala[2]

     [1] Dirección de Investigaciones Epidemiológicas y Psicosociales, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Ciudad de México, México.
     [2] Departamento de Publicaciones, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Ciudad de México, México.

- Al final de la primera página, en el apartado ***"Correspondencia"***, se proporcionarán los datos de contacto del autor corresponsal (dirección postal completa, teléfono, correo electrónico). Es con quien Salud Mental se comunicará durante todo el proceso editorial.

  Ejemplo:

  Correspondencia:
  Juan José García-Urbina
  Dirección de Investigaciones Epidemiológicas y Psicosociales, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz.
  Calz. México-Xochimilco 101, San Lorenzo Huipulco, Tlalpan, 14370, Ciudad de México, México.
  Tel: 55 4152-3624
  E-mail: jurb@imp.edu.mx

5. La segunda página debe contener los resúmenes del trabajo presentado en inglés y español. *Extensión máxima: 250 palabras.*
   - ***Artículos originales y Revisiones sistemáticas.*** Los resúmenes deben estar conformados por: Introducción, Objetivo, Método, Resultados y Discusión y conclusión.
   - ***Casos Clínicos.*** Los resúmenes deben estar conformados por: Introducción, Objetivo, Principales hallazgos, Intervenciones y resultados y Discusión y conclusión.
   - ***Palabras clave.*** Al final de cada resumen se incluirá un mínimo de cuatro y un máximo de seis palabras clave, separadas por comas y en minúsculas. Las palabras clave deben ser las mismas en inglés y en español. Éstas suelen emplearse para la indexación de los artículos, por lo cual tres de ellas deben encontrarse en el MeSH (*Medical Subject Headings*) que se puede consultar en: *http://www.nlm.nih.gov/mesh/MBrowser.html*.
6. A partir de la tercera página comienza el cuerpo del manuscrito, el cual deberá conservar la estructura señalada en el resumen.
   - ***Introducción (o Antecedentes en el caso de las Revisiones narrativas).*** El último párrafo de este apartado debe incluir de forma clara los objetivos del trabajo y, si se cree necesario, las hipótesis.
   - ***Método.*** Es preciso que cuente con las siguientes secciones:
     - Diseño del estudio
     - Participantes/descripción de la muestra
     - Sedes
     - Mediciones
     - Procedimientos
     - Análisis estadísticos
     - Lineamientos éticos.

   Nota: En caso de los artículos de revisión y casos clínicos, estas secciones pueden ser modificadas de acuerdo con la guía PRISMA (revisiones sistemáticas o la guía CASE REPORT (casos clínicos).

   - **Resultados.** Se presentarán en una secuencia lógica dentro del texto. Pueden apoyarse con tablas, gráficas y figuras.
   - **Discusión y conclusión.** En esta sección se destacarán los aspectos nuevos e importantes del estudio y las conclusiones que derivan del mismo, así como las posibles implicaciones de sus hallazgos y sus limitaciones.
7. Después del apartado de Discusión y conclusión, es preciso agregar las declaraciones de los autores en el siguiente orden:
   - ***Financiamiento.*** En este apartado se debe declarar si el estudio o la preparación del manuscrito recibió algún tipo de financiamiento, indicando el nombre de la entidad que proporcionó los fondos.

     Ejemplo:

     Este estudio fue financiado en parte por el CONSEJO NACIONAL DE CIENCIA Y TECNOLOGÍA. (No. XXXXXXX).

     Si no se recibió ningún apoyo financiero, los autores deben declararlo también.

     Ejemplo:

     Ninguno.

   - ***Conflicto de intereses.*** En esta sección, los autores deberán declarar si tienen conflictos de intereses relacionados con su actividad científica. Tener un conflicto de interés no supone necesariamente un impedimento para la publicación del manuscrito. Si no existe conflicto de interés se debe insertar la siguiente frase: *"Los autores declaran no tener algún conflicto de intereses"*.
   - ***Agradecimientos.*** Cuando se considere necesario, se mencionarán después de las declaraciones anteriores los agradecimientos a personas, centros o entidades que hayan colaborado o apoyado en la investigación.
8. **Referencias.** Las referencias se colocan después de las declaraciones del autor (Financiamiento, Conflicto de intereses y Agradecimientos), y ***deben seguir exclusivamente las normas de publicación de la American Psychological Association (APA), en su última edición*** (https://normas-apa.org).
9. **Tablas y figuras.** Salud Mental establece un máximo de cinco elementos gráficos en total. ***El estándar solicitado para la elaboración de tablas y figuras es el de la American Psychological Association (APA), última edición*** (https://normas-apa.org)***.*** Éstas se colocarán al finaldel manuscrito después de las referencias:
   - Las tablas deben contener título y, en la parte inferior, una nota con el desglose de las siglas.
   - Las figuras deben enviarse en un formato de alta resolución (mínimo 300 dpi).
   - Los títulos de las tablas y los pies de las figuras deben ser claros, breves y llevar siempre el número correspondiente que los identifique. Dentro del texto, el autor debe indicar entre paréntesis y con mayúsculas en qué parte del texto sugiere insertar los elementos gráficos.

     Ejemplo:

     Se cambiaron las definiciones de algunos patrones conductuales (Tabla 3) de manera que fueran más comprensibles en el idioma español y se redefinieron las categorías que agrupan dichos patrones con base en la literatura especializada. (INSERTAR AQUÍ TABLA 3)

ARCHIVOS COMPLEMENTARIOS

1. ***Carta de autorización de uso de la obra*.** Debe estar firmada por todos los autores y enviarse en formato PDF que se puede descargar en http://revistasaludmental.gob.mx/public/Carta-autorizacion-para-publicacion.pdf.
2. ***Carta de presentación.*** El autor debe exponer las fortalezas de su aportación científica, resaltando el alcance, la originalidad y la importancia de su contribución

al campo de la salud mental. *Es de carácter obligatorio mencionar a tres revisores nacionales o internacionales en el campo de conocimiento del manuscrito sometido, favor de indicar el nombre completo y correo electrónico de cada uno de los revisores.* Debe cargarse en formato PDF.

ÉNFASIS Y PUNTUACIÓN

1. Es importante que los manuscritos eviten en general las notas a pie de página, aunque se pueden considerar si son claramente necesarias.
2. Las cursivas deben utilizarse para:
   - Destacar palabras extranjeras.
   - Enfatizar expresiones populares.
   - Mencionar títulos de libros, documentos ya publicados y publicaciones periódicas.
3. Las cursivas pueden emplearse para:
   - Resaltar términos significativos o importantes cuando se mencionan por primera vez.
   - Destacar una palabra u oración dentro de una cita.
4. Las comillas dobles deben usarse solamente para:
   - Citar párrafos de otros autores dentro del texto.
   - Citar textualmente fragmentos del discurso de los sujetos de estudio.
5. Evite el uso de paréntesis doble, es decir, un paréntesis dentro de otro. En su lugar utilice corchetes.
6. Puede emplearse guiones largos para indicar oraciones parentéticas.
7. Deben utilizarse de forma correcta todos los signos de puntuación. Por ejemplo, si emplea signos de interrogación en un texto en español, deben colocarse los de apertura y cierre correspondientes; se procede de igual manera con las comillas.

FÓRMULAS MATEMÁTICAS Y ESTADÍSTICAS

Para presentar los resultados se deben considerar las siguientes indicaciones:

1. Escribir con letra las cifras de cero a nueve y con números las cifras de 10 en adelante.
2. Utilizar números cuando se trate de fechas, muestras, etcétera.
3. Incluir en los datos estadísticos los intervalos de confianza.
4. Los símbolos estadísticos se escriben en cursivas (por ejemplo, *M, SD, n, p)*.
5. Expresar la probabilidad exacta con dos o tres decimales (por ejemplo, p = .04; p = .002) sin el cero adelante del punto decimal. En caso de ser menor a .001 indicarlo con un < .001.
6. Dejar un espacio antes y después de cada signo (a + b = c en lugar de a+b=c).
7. Emplear puntos en lugar de comas para indicar decimales.

VERIFIQUE LO SIGUIENTE ANTES DE SOMETER SU MANUSCRITO

Antes de enviar su manuscrito, cerciórese de adjuntar la documentación solicitada. A los autores, se les devolverá aquellos envíos que no cumplan con los lineamientos editoriales.

1. Manuscrito en formato en WORD.
2. Carta de presentación en formato PDF.
3. Carta de autorización de uso de obra en formato PDF.

GUIDELINES FOR AUTHORS

Salud Mental publishes original articles on psychiatry, psychology, neurosciences and other related fields in the following formats:

1. **Editorials**
   Written at invitation of the Director Editor, editorials express authoritative opinions on specific topics of interest to the scientific community and the area of mental health. They are designed to foster debate and promote new lines of research. *Maximum extension: 1000 words*.
2. **Original articles (peer-reviewed section)**
   These articles present research results unpublished in other journals, and can be written using the following methodologies:
   - *Quantitative methodology.* This methodology includes primary and secondary results from cross-sectional studies, clinical trials, cases and controls, cohorts, and quasi-experimental studies. *Maximum extension: 3500 words*.
     Depending on the type of study, manuscripts should adhere to the following guidelines:
     - Randomized clinical trials should adhere to the *CONSORT guidelines* (http://www.consort-statement.org).
     - Studies with non-experimental designs should adhere to the *TREND guidelines* (http://www.trend-statement.org).
     - Cross-sectional, cohort, and case-control studies should adhere to the *STROBE guidelines* (http://www.strobe-statement.org).
   - *Qualitative methodology.* This methodology includes focus group reports, in-depth interviews, semantic networks, and content analysis. *Maximum extension: 5000 words*.
     Articles using this type of methodology should comply with the *COREQ guidelines* (https://academic.oup.com/intqhc/article/19/6/349/1791966/Consolidated-criteria-for-reporting-qualitative).
3. **Review articles (peer-reviewed section)**
   - **Systematic reviews.** These reviews should preferably include a meta-analysis. *Maximum extension: 4000 words*.
4. **Case reports**
   They include reports on the effects of a diagnostic or therapeutic method that is useful or relevant in the medical, academic, or scientific field. *Maximum length: 2000 words.*
   These should comply with the *CASE REPORT guidelines* (https://www.care-statement.org/checklist).

Note. The word count for each of these sections excludes the title, abstracts, and keywords, as well as the funding, conflicts of interest and acknowledgments sections. Words included in tables, figures and references are not considered either.

LANGUAGES

Salud Mental receives and publishes only manuscripts in English.

ETHICAL ASPECTS IN PUBLISHING

See Ethical Guidelines for the journal at www.revistasaludmental.gob.mx

AUTHORSHIP

The number of authors will depend on the type of manuscript submitted. The maximum number of authors for original or review articles is eight. Only in the case of multicenter studies will the maximum number of authors be increased to twelve, provided this is justified by the scope of the study.

In the event of collective authorship, the name of the editors or those responsible for the article will be included followed by “and the group...” when all members of the group consider themselves co-authors of the work. If the name of the group is to be included, even if not all its members are considered co-authors, the authors responsible will be mentioned followed by “on behalf of the ...group or “by the...group.” In any case, the names and institutions to which members of the group are affiliated should be included in an appendix at the end of the manuscript.

EDITORIAL GUIDELINES

It is of the utmost importance for authors to consider the following before sending their manuscript:

1. Manuscripts should be written clearly and concisely, with no spelling or grammatical errors.
2. The text should be written in Word format, Times New Roman font, size 12, with double-spacing and 2.5 cm margins on letter size sheets.
3. Pages should be numbered consecutively, beginning with the title page, with the number written in the upper right corner.
4. The first page (showing the title) should contain the following sections in the order mentioned here:
   - *Title of article in Spanish and English*. The title should be descriptive and indicate the main results of the study. *Maximum extension: 25 words.*
   - *Short title in Spanish and English*. *Maximum extension: 6 words.*
   - *Full name of author and co-authors*. The authors must be listed and then an Arabic number must be placed in superscript, indicating the institution to which they are affiliated.
   - *Author ORCID number.* It is a requirement that all authors have their ORCID identification number, which can be obtained at https://orcid.org/register
   - *Author affiliation*. This should be indicated with Arabic numerals and in superscript. Affiliations should be placed immediately after authors’ names (not as footnotes). Affiliations should specify the department, area, institution, city, and country of each author. It is not necessary to indicate the postal address. Institutions must be written in their original language, without translation. If the authors add acronyms, these must be included in the official name. No positions or degrees of the authors (such as doctor, resident, or researcher) should be written.

   . For example:

   Juan José García-Urbina,[1] Héctor Valentín Esquivias Zavala[2]

   [1] Dirección de Investigaciones Epidemiológicas y Psicosociales, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Ciudad de México, México.
   [2] Departamento de Publicaciones, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Ciudad de México, México.

- The **"Correspondence"** section should be placed at the end of the first page, indicating the corresponding author with their postal address, phone and email address. This will be the only author Salud Mental will contact during the process.

  For example:

  Correspondence:
  Juan José García-Urbina
  Dirección de Investigaciones Epidemiológicas y Psicosociales, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz.
  Calz. México-Xochimilco 101, San Lorenzo Huipulco, Tlalpan, 14370, Ciudad de México, México.
  Phone: 55 4152-3624
  E-mail: jurb@imp.edu.mx

5. The second page should contain abstracts of the article in English and Spanish. Each abstract should contain a maximum of 250 words.
   - **Abstracts of original articles and systematic reviews** should comprise the following: Introduction, Objective, Method, Results, and Discussion and Conclusion.
   - **Abstracts of Clinical Cases** should comprise Introduction, Objective, Main findings, Interventions, Results, and Discussion and Conclusion.
   - **Keywords.** At the end of each abstract, a minimum of four and a maximum of six keywords should be included, separated by commas and in lower case. Keywords must be the same in English and Spanish. These are used for indexing articles, which is why three of them must be found in the *MeSH (Medical Subject Headings)* (http://www.nlm.nih.gov/mesh/MBrowser.html).
6. The body of the manuscript begins on the third page, which should follow the structure indicated in the abstract:
   - **Introduction (or Background for Narrative Reviews)**. The last paragraph of this section should clearly include the objectives of the review and, if necessary, the hypotheses.
   - **Method.** This should contain the following sections:
     - Study design
     - Subjects/sample description
     - Sites
     - Measurements
     - Procedure
     - Statistical analysis
     - Ethical considerations (See ethical guidelines for publication. Add link)

     In the case of review articles and clinical cases, these sections may be modified in keeping with the PRISMA guideline (systematic reviews) or the CASE REPORT guideline (clinical cases).
   - **Results.** These should be presented in a logical sequence within the text. They can be supported with tables, graphs, and figures.
   - **Discussion and Conclusion**. This section will highlight new and relevant aspects of the study and the conclusions derived from it, as well as the possible implications of its findings and its limitations.
7. After the Discussion and Conclusion section, author statements should be added in the following order:
   - **Funding**. In this section, authors should declare whether the study or the preparation of the manuscript received any type of funding, indicating the name of the entity that provided the funds.

     For example:

     This study was partially funded by CONSEJO NACIONAL DE CIENCIA Y TECNOLOGÍA (No. XXXXXXX).

     If no financial support was received, authors must state it was well.

     For example:

     None.
   - **Conflict of interest.** In this section, authors must declare whether they have conflicts of interest related to their scientific activity. Having a conflict of interest will not necessarily prevent publication of the manuscript. If there is no conflict of interest, the following phrase must be inserted: "The authors declare that they have no conflicts of interest."
   - **Acknowledgments**. If deemed necessary, acknowledgment of the people, centers or entities that have collaborated or supported the research will be mentioned after the previous statements.
8. **References.** Are placed after the authors' declarations (Funding, Conflicts of interest, and Acknowledgements), and must adhere to the ***Publication Guidelines of the American Psychological Association (APA), last edition*** (https://normas-apa.org).
9. **Tables and figures.** *Salud Mental* establishes a maximum total of five graphic elements. The standard requested for tables and figures adheres to the ***Guidelines of the American Psychological Association (APA), last edition*** (https://normas-apa.org). These will be placed in the same document as the manuscript after the references.
   - Tables must contain a title and a note with an explanation of the acronyms used at the bottom.
   - Figures must be submitted in a high resolution format (minimum image size 300 dpi).
   - Titles of the tables and figure captions must be clear, brief, and always have an identifying number. Within the text, the author must indicate in parentheses and capital letters where the graphic elements should be inserted.

     For example:

     The definition of some behavioral patterns was changed (Table 3) so that they were more comprehensible in Spanish and the categories that group such patterns were redefined based on specialized literature. (INSERT TABLE 3 HERE)

COMPLEMENTARY FILES

1. **Authorization letter for Publication**. This should be signed by all the authors and submitted in PDF format. Download the form at http://revistasaludmental.gob.mx/public/Authorization-letter-for-publication.pdf.
2. **Cover letter**. The author should describe the strengths of their scientific contribution, highlighting the scope, originality, and importance of their contribution to the field of mental health. *It is mandatory to mention three national or international reviewers in the field of knowledge of the submitted manuscript, please indicate the full name and email address of each of the reviewers.* This must be uploaded in PDF.

EMPHASIS AND PUNCTUATION

1. Manuscripts should generally avoid footnotes, although they may be considered if essential.
2. Italics should be used to:
   - Highlight foreign words
   - Emphasize popular expressions
   - Mention titles of books, published documents and periodicals
3. Italics can be used to:
   - Highlight significant or important terms when they are first mentioned
   - Highlight a word or sentence within a quote
4. Double quotes should only be used for:
   - Citing paragraphs from other authors within the text
   - Quoting verbatim fragments of the study subjects' words
5. Avoid using double parentheses, in other words, one parenthesis inside another, and use square brackets instead.
6. Long dashes can be used to indicate parenthetical sentences.
7. All punctuation marks must be used correctly. For example, if question marks are used in a Spanish text, the corresponding opening and closing signs must be included together with quotation marks.

MATHEMATICAL AND STATISTICAL FORMULAE

The following points must be considered when results are presented:

1. Write figures from zero to nine in letters and use numbers for figures from 10 onwards.
2. Use numbers with dates and samples, etc.
3. Include confidence intervals in statistical data.
4. Statistical symbols are written in italics (M, SD).
5. Express exact probability to two or three decimal places (for example, p = 0.04; p = 0.002), *with no zero in front of the decimal point.* If it is less than .001, it should be written as follows < 0.001.
6. Leave a space before and after each sign (a + b = c instead of a+b=c).
7. Use periods instead of commas to indicate decimals.

PLEASE CHECK THE FOLLOWING BEFORE SUBMITTING YOUR MANUSCRIPT

Before submitting your manuscript, be sure to attach the requested documentation. Submissions failing to comply with the editorial guidelines will be returned to authors.

1. Manuscript in WORD format
2. Cover letter in PDF format
3. Letter authorizing the use of the article