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CONTENT

ORIGINAL ARTICLES

On the cover
Woman in blue reading a letter (about 1663-64)

Johannes Vermeer,
(1632-1675)
Oil on canvas, 46.5 × 39 cm
Rijksmuseum, Amsterdam

REVIEW ARTICLE

Instituto Nacional de Psiquiatría
Ramón de la Fuente Muñiz

Directorio

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ORIGINAL ARTICLE
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Psychometric properties of the Diurnal Insomnia Symptoms Response Scale (DISRS) in a Mexican population sample

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ABSTRACT

Introduction. Increased rumination is associated with longer night-time sleep onset latency and poorer sleep quality and efficiency in people with insomnia symptoms. **Objective.** To validate the Diurnal Insomnia Symptoms Response Scale (DISRS) in a general population sample. **Method.** 102 participants (women = 67 and men = 35) comprising patients and relatives who attended an outpatient consultation at a health center in Mexico City were evaluated. The English-Spanish-English translation system was used by two Spanish-speaking experts on the subject, an independent bilingual expert translated the new version of the scale into English, which was then compared with the original. The following self-administered questionnaires were used to evaluate the convergent, discriminant validity of this tool: the Ruminative Response Scale (RRS), the Insomnia Severity Index (ISI), and Penn State Worry Questionnaire (PSWQ). **Results.** The internal consistency of the scale items was α = .93. Principal components factor analysis yielded three factors with an eigenvalue of greater than one, which together explain 59.5% of the variance. Correlations between the total DISRS score and the cognitive-motivational dimensions (r = .938, p < .01), negative state (r = .898, p < .01) and tiredness (r = .853, p < .01) were statistically significant. Insomnia symptoms (SCC = .89) outweighed worries (SCC = .33) and ruminant responses (SCC = .33) when discriminating between cases with low and high levels of rumination associated with insomnia symptoms. **Discussion and conclusion.** Our results suggest that the DISRS scale has adequate psychometric properties that make it valid and reliable for use with the Mexican population.

Keywords: Rumination, insomnia, validity, reliability.

RESUMEN

Introducción. Los pensamientos rumiativos se asocian con mayor latencia del sueño, peor calidad y eficiencia de sueño en personas con insomnio. **Objetivo.** Realizar la validación de la escala de respuestas a los síntomas diurnos del insomnio (DISRS) en una muestra de población general en México. **Método.** Se evaluaron a 102 participantes (mujeres = 67 y hombres = 35) que acudieron a consulta externa de un centro de salud de la Ciudad de México. Se utilizó el sistema de traducción inglés-español-inglés, un experto bilingüe independiente tradujo al inglés la nueva versión de la escala y se verificó con el original. Para evaluar la validez convergente y discriminante del DISRS, se aplicó la Escala de Respuestas Rumiativas (RRS), el Índice de Severidad del Insomnio (ISI) y el Cuestionario de Preocupaciones de Pensilvania (PSWQ). **Resultados.** La consistencia interna de los ítems fue α = .93. El análisis factorial de componentes principales determinó tres factores con valor propio superior a uno, que explican 59.5% de la varianza. Las correlaciones del puntaje del DISRS con las dimensiones cognitivo-motivacional (r = .938, p < .01), estado negativo (r = .898, p < .01) y cansancio (r = .853, p < .01) resultaron significativas. Los síntomas de insomnio (CCE =.89) tuvieron más peso que las preocupaciones (CCE = .33) y las respuestas rumiativas (CCE = .33) al discriminar a los casos con bajos y altos niveles de rumiación asociada al insomnio. **Discusión y conclusión.** La escala DISRS en español tiene adecuadas propiedades psicométricas que la hacen válida y confiable para ser utilizada en población mexicana.

Palabras clave: Rumiación, insomnio, validez, confiabilidad.

INTRODUCTION

Insomnia is defined as a persistent difficulty in sleep onset, duration, consolidation and/or quality that occurs despite the existence of adequate circumstances and opportunity to sleep, is accompanied by a significant level of impairment in social development areas, occupational, educational, academic, or behavioral functioning (American Academy of Sleep Medicine, 2014). Nocturnal symptoms are characterized by difficulty falling asleep when someone goes to bed, difficulty staying asleep, early morning awakening with inability to return to sleep, and unrefreshing sleep (American Psychiatric Association, 2013). The main daytime symptoms of insomnia are fatigue, drowsiness, impaired memory, attention, and concentration, reduced academic or occupational productivity, altered mood, difficulty in decision-making, low motivation, and impaired social and emotional functioning (Mai & Buysse, 2008; Nami, 2014).

The cognitive model of insomnia (Harvey, 2002) indicates that repetitive negative thoughts about sleep would increase the level of cerebral cortical activation, leading to a state of hyper alertness and difficulty falling asleep. At the same time, these persistent thoughts would be accompanied by dysfunctional concerns and beliefs about sleep, selective attention and monitoring of stimuli that can impair sleep, counterproductive safety behaviors (e.g., spending more time in bed, daytime naps), which would propitiate the chronic evolution of insomnia.

Ruminative thinking or rumination is a set of repetitive, recurrent negative thoughts that focus attention on oneself, emotions, worries, and stressful or negative experiences (Watkins, Moberly, & Moulds, 2008; Nolen-Hoeksema & Watkins, 2011). Evidence exists on the relationship between rumination and insomnia; previous research has reported an increase in sleep latency time, poor sleep quality and reduction in sleep efficiency in insomniac patients compared to healthy subjects (Galbiati, Giora, Sarasso, Zucconi, & Ferini-Strambi, 2018), young adults with depressive symptoms (Pillai, Steenburg, Ciesla, Roth, & Drake 2014) and graduate students (Van Laethem, Beckers, van Hooff, Dijksterhuis, & Geurts, 2016). On the other hand, ruminative thoughts have been found to reduce deep sleep time and increase awakenings throughout the night (Gregory et al., 2011). In turn, rumination focused on the insomnia consequences would increase during the day, while anticipated concerns about difficulty sleeping would be more prominent at bedtime (Ong & Tu, 2020; Lancee, Eisma, van Zanten, & Topper, 2017).

Previous research has used different scales to assess rumination in patients with sleep problems, such as the Symptom-Focused Rumination Subscale (Bagby, Rector, Bacchiochi, & McBride, 2004) from the Response Styles Questionnaire (Nolen-Hoeksema & Morrow, 1991), Ruminative Response Scale (Nolen-Hoeksema & Morrow, 1991), Rumination Reflection Questionnaire (Trapnell & Campbell, 1999) and Ruminative Thought Scale Questionnaire (Brinker & Dozois, 2009), however, these instruments do not contain specific questions about ruminative thoughts, diurnal symptoms and insomnia consequences.

Carney, Harris, Falco, & Edinger (2013) designed the DISRS scale to identify daytime ruminative thoughts in insomniacs. It consists of 20 items that are divided into three subscales: 1. level of motivation and cognitions about sleep, 2. negative affective state, and 3. tiredness. DISRS was originally written in English, it has been applied to the general population in the United States (Tutek, Gunn, & Lichstein, 2021) and has been translated into other languages such as Italian (Palagini, 2015) and Norwegian (Norwegian Association for Cognitive Therapy, s.f.).

Some researchers suggest differentiating between repetitive ideas associated with various psychiatric disorders and repetitive thoughts linked to fatigue and tiredness. These last two clinical manifestations are characteristic of rumination associated with insomnia (Carney, Harris, Moss, & Edinger, 2010; Tutek et al., 2021).

The main purpose of this research was to determine the psychometric properties (internal consistency, construct validity, convergent validity, and discriminant validity) of the DISRS scale in a sample of participants who attended a general medicine outpatient clinic and live in Mexico City.

Research hypothesis

Hypothesis 1: The DISRS scale has adequate psychometric properties to measure rumination focused on daytime symptoms of insomnia.
Hypothesis 2: The DISRS scale correlates significantly with insomnia, worry, and ruminative responses scales.

METHOD

Study design

This is a cross-sectional study, conducted between June 2019 and January 2020.

Subjects and place

The DISRS scale was administered to a sample comprising patients and relatives seeking outpatient general medicine care at a T-IIII health center located in the south of Mexico City (n = 102). The sample size was defined using the rule of five participants for each questionnaire item, $5 \times 20 = 100$ (Streiner et al., 2003) and convenience sampling was used. Our inclusion criteria were people aged 18 years or older, who could read and write, who agreed to participate voluntarily and did not have cognitive deficits or any other medical

condition that prevented them from answering the questionnaire. People who did not wish to participate (n = 7) or failed to complete the questionnaire (n = 5) were excluded from the study.

Exclusion criteria: Participants < 18 years old, people with a serious medical or psychiatric illness such as parkinson's disease, schizophrenia, bipolar disorder, dementia of any etiology, an obvious intellectual disability. Those who did not want to participate in the study complete questionnaire were also excluded.

Instruments

Daytime Insomnia Symptom Response Scale (DISRS)

This scale comprises a 20-item, self-administered questionnaire developed and validated (Carney, 2013). Subjects are asked how often they engage in a series of behaviors when they feel tired and sleepy. Scores range from 20 to 80 points and there is no defined cut-off point: the higher the scores on the scale, the higher the level of ruminative thinking. In the validation process, the authors thought that this instrument had good internal consistency (α = .93, -.94) and through exploratory factor analysis, they identified three dimensions: 1. cognitive/motivational (items: 3, 4, 5, 6, 7, 12, 17, 18), 2. negative state (items 1, 8, 9, 10, 11, 14, 15, 19) and 3. tiredness (items 2, 13, 16, 20). These three factors explained 58.12% of the total variance.

Spanish translation of the DISRS scale

The Spanish translation of the DISRS scale was undertaken by the main author, after which a bilingual group of three experts reviewed the translation of the scale into Spanish. A pilot test was conducted with ten insomniac patients to assess the level of understanding of the questions and the time it took to fill out the questionnaire.

An independent bilingual expert was asked to translate our Spanish version of the DISRS (back translation) into English. The same bilingual group subsequently reviewed the English translation done by the expert and considered that the Spanish version was similar to the original scale.

Ruminative Response Scale (RRS)

The RRS assessing two components of rumination: reflection, which refers to behaviors related to the analysis of the difficulties experienced, and reproach, which involves repetitive thoughts focused on psychological discomfort and negative self-evaluation. The RRS response options are provided on a four-point Likert scale, with total scores ranging from 22 to 88 points. The higher the score, the higher the level of ruminative thinking (Nolen-Hoeksema & Morrow, 1991). The Mexican Spanish version was validated; the Cronbach's alpha coefficient obtained was .93, for the reflection subscale α = .77 and for the reproach subscale α = .78 (Hernández-Martínez, García Cruz, Valencia Ortiz, & Ortega Andrade, 2016).

Insomnia Severity Index (ISI)

This instrument was designed to screen for insomnia symptoms (Bastien, Morin, Ouellet, Blais, & Bouchard, 2004). It consists of seven self-assessment questions that explore the level of severity of insomnia, satisfaction with the current sleep pattern, the level of dysfunction attributed to the sleep problem, and the degree of concern caused by insomnia. The answers options are provided on a 5-point Likert scale (0 = Not at all to 4 = extremely), with scores ranging from 0-28. A score of 0-7 indicates that there is no insomnia; 8-14 points correspond to mild insomnia; 15-21 points indicates moderately severe insomnia, and 21-28 points suggests severe insomnia. The internal consistency of this instrument is adequate, with Cronbach's alpha values ranging from .82 to .92 (Fernandez-Mendoza et al., 2012; Gagnon, Bélanger, Ivers, & Morin, 2013).

Penn State Worry Questionnaire (PSWQ)

This scale comprises 16 items assessing the general tendency to worry rather than being restricted to one or two situations. The PSWQ has been administered in general and clinical population studies. It contains Likert answer options, is scored from 1 to 5 points, and five of the items: 1, 3, 8, 10 and 11 are reverse scored. However, there are versions of this scale in which all the questions are direct and there are no reverse items (Meyer, Miller, Metzger, & Borkovec 1990). PSWQ was validated in the Mexican population, finding an internal consistency of α = .917 (Padros, González, Martínez, & Wagner, 2018).

Procedure

Patients and family members were invited to participate in the study, while they were in the waiting room of the health center. If they agreed to participate, they were informed that they had to answer a series of questionnaires, including the DISRS. Sociodemographic and clinical variables such as age, gender, marital status, educational attainment, employment status, current health problems, and insomnia were also evaluated.

Before the information was collected, written informed consent was requested from all those who had voluntarily agreed to participate in the study.

Ethical considerations

This study was conducted in accordance with the general principles of the Declaration of Helsinki (Mazzanti, 2011). Approval was obtained from Research Ethics Committee of the National Institute of Psychiatry Ramón de la Fuente Muñiz (Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, INPRFM; with agreement number CEI-010-20170316).

Statistical analysis

The STATA 16.1 program was used for the statistical analysis. The mean and standard deviation were calculated for continuous variables. In the case of categorical variables, frequencies, percentages, and total scores were calculated for each participant. The Student's t test was used to compare the means of our variables and determine whether there are differences between men and women.

Internal consistency analysis was performed by calculating Cronbach's alpha coefficient and Pearson's correlation coefficients between the items and the total scale. To validate the questionnaire, an exploratory factor analysis was performed using the principal components method with varimax rotation and eigenvalues greater than one to assess the construct validity of the DISRS. Correlations with the other scales (ISI, RRS, and PSWQ) were subsequently calculated and lastly discriminant validity was evaluated through standardized canonical coefficients (SCC) and cases were classified according to the high and low DISRS scores.

RESULTS

102 subjects were included, 67 of which are women (65.7%) and 35 men (34.3%). Table 1 shows their sociodemographic and clinical characteristics. We found a slight difference between men and women in the average of the scales administered, DISRS ($\bar{x}$ = 35.27, SD = 11.32 *vs.* $\bar{x}$ = 30.94, SD = 9.37), ISI ($\bar{x}$ = 8.59, SD = 6.07 *vs.* $\bar{x}$ =7.6, SD = 5.97), RRS ($\bar{x}$ = 40.43, SD = 12.19 *vs.* $\bar{x}$ =36.4, SD = 13.22), PSWQ ($\bar{x}$ = 41.11, SD = 14.51) *vs.* $\bar{x}$ = 37.11, SD = 15.11).

Internal consistency: The Cronbach's alpha coefficient of the DISRS scale was .93. This result indicates that there is a high consistency between the items comprising this scale. Table 2 shows the Pearson correlations of all the DISRS items. In general, the 20 questions achieved Cronbach's alpha values above .90. The internal consistency of the three subscales was slightly lower than the total result. The negative affective state subscale had a consistency of α = .89, the cognitive/motivational subscale had a consistency of α = .85 and the fatigue subscale had a consistency of α = .72.

Table 1
Description of sociodemographic and clinical variables

Variables	*n (%)*	*Women*	*Men*
Age			
18-25 years	26 (25.5)	15 (22.73)	11 (30.56)
26-40 years	45 (44.1)	28 (42.42)	18 (49.98)
41-60 years	27 (26.5)	21 (31.82)	5 (13.9)
> 60 years	4 (3.9)	2 (3.03)	2 (5.56)
Sex	102 (100)	66 (64.71)	36 (35.29)
Educational attainment			
Elementary	9 (8.8)	7 (10.61)	2 (5.56)
Junior high	33 (32.3)	19 (28.79)	15 (41.67)
Senior high	36 (35.3)	25 (37.88)	11 (30.56)
Undergraduate degree	18 (17.7)	9 (13.64)	5 (13.89)
Other	6 (5.9)	6 (9.09)	3 (8.34)
Marital status			
Single	35 (34.3)	20 (30.3)	15 (41.67)
Married/living together	60 (58.8)	43 (65.15)	18 (50)
Divorced	5 (4.9)	2 (3.03)	2 (5.56)
Widowed	2 (1.9)	1 (1.52)	1 (2.78)
Employment status			
Employed	59 (57.9)	31 (46.97)	27 (75)
Unemployed	43 (42.1)	35 (53.03)	9 (25)
Health problems			
Yes	29 (28.4)	20 (30.3)	8 (22.22)
No	73 (71.6)	46 (69.7)	28 (77.78)
Insomnia severity index (ISI)			
Mean	8.2 (SD:6.0)	8.59 (6.07)	7.6 (5.97)
DISRS scale			
Mean	33.8 (SD:10.9)	35.27 (11.32)	30.94 (9.87)
RRS scale			
Mean	39.1 (SD:12.6)	40.43 (12.19)	36.4 (13.22)
PSWQ scale			
Mean	39.6 (SD:14.8)	41.11 (14.51)	37.11 (15.11)

Notes: DISRS: Diurnal Insomnia Symptoms Associated with Rumination Scale; RRS: Ruminative Response Scale; ISI: Insomnia Severity Index; PSWQ: Penn State Worry Questionnaire; SD: Standard Deviation.

Table 2
Pearson correlation coefficients between items and total scale

Item	Item-test correlation	Item-test correlation	Average inter-item covariance	Cronbach's Alpha
DISRS 1	.6395	.6020	.2887	.9361
DISRS 2	.5669	.5175	.2890	.9374
DISRS 3	.6461	.5975	.2821	.9362
DISRS 4	.7676	.7341	.2766	.9337
DISRS 5	.6829	.6437	.2835	.9353
DISRS 6	.5574	.4946	.2848	.9384
DISRS 7	.6459	.5992	.2831	.9361
DISRS 8	.7454	.7080	.2768	.9341
DISRS 9	.7651	.7347	.2798	.9338
DISRS 10	.7398	.7026	.2779	.9342
DISRS 11	.8226	.7966	.2746	.9326
DISRS 12	.7252	.6865	.2788	.9345
DISRS 13	.6984	.6564	.2799	.9351
DISRS 14	.7813	.7506	.2770	.9334
DISRS 15	.6681	.6240	.2822	.9356
DISRS 16	.6611	.6154	.2821	.9358
DISRS 17	.6968	.6620	.2849	.9352
DISRS 18	.5936	.5377	.2841	.9374
DISRS 19	.5490	.4911	.2873	.9381
DISRS 20	.6915	.6505	.2814	.9352
			.28178	.9385

Validity: The exploratory factor analysis was based on the results published by the authors (Carney et al., 2013) who identified three factors: 1. cognitive-motivational, 2. negative affect and 3. tiredness. Since all the items on the scale achieved communalities of over .30, they were included in the factor analysis. A 3-component solution was obtained, explaining 59.5% of the variance, a large part of the total variance is explained by cognitive-motivational factor with 47.21%, while the other two factors, negative state, and fatigue, explain 6.56% and 5.76%, respectively. The Kayser-Meyer-Olkin (KMO) sampling adequacy index was .92 and the Barlett's sphericity coefficient proved to be statistically significant (Chi square: 1143.41, gl: 190 $p = .001$). Table 3 shows the factorial loads of each item with the varimax rotation.

This criterion was confirmed by the sedimentation graph (Figure 1), which shows that the eigenvalues begin to form a straight line after the third main component. Accordingly, the remaining principal components only explain a small proportion of the variability, close to zero, and are unimportant.

Regarding the convergent validity of the scale, we calculated the correlations between the variables of interest (Table 4). As expected, the DISRS Scale correlated positively with insomnia symptoms ($r = .648$; $p < .01$), worries ($r = .732$; $p < .01$), and ruminant responses ($r = .778$; $p < .01$).

Table 3
Rotated component matrix and item factor loads

		Components		
Items		1 Cognitive-motivational	2 Affective state	3 Tiredness
1	They think "I won't be able to work because I feel very bad."	.523	.141	.446
2	They think about their feelings of tiredness.	-.015	.710	.352
3	They think about how difficult it is to concentrate.	.167	.255	.780
4	They think about how demotivated they feel.	.750	.326	.189
5	They think about how cloudy or confused their thoughts are.	.695	.233	.185
6	They think about how everything requires more effort than usual.	.065	.299	.685
7	They think "Why can't I get ahead?"	.722	.140	.192
8	They think how sad they feel.	.681	.290	.266
9	They think how they do not feel they want to do anything or any activity.	.594	.394	.315
10	They think about their feelings of pain.	.486	.575	.203
11	They think how bad they feel.	.472	.680	.270
12	They think how difficult it is to keep their mind on a task.	.604	.055	.588
13	They think about how tired they feel.	.263	.453	.550
14	They think, "I can't get rid of this feeling."	.718	.390	.182
15	They think about how irritable they feel.	.564	.531	-.005
16	They think about how sleepy they feel.	.232	.687	.247
17	They think, "It seems I can't pay attention."	.465	.129	.641
18	They think, "I am forgetful."	.363	.246	.415
19	They think, "I can't be near people when I feel like this."	.302	.490	.119
20	They think. "I don't have enough energy to get through the day."	.361	.601	.233

Note: Rotation method: Varimax with Kaiser normalization.

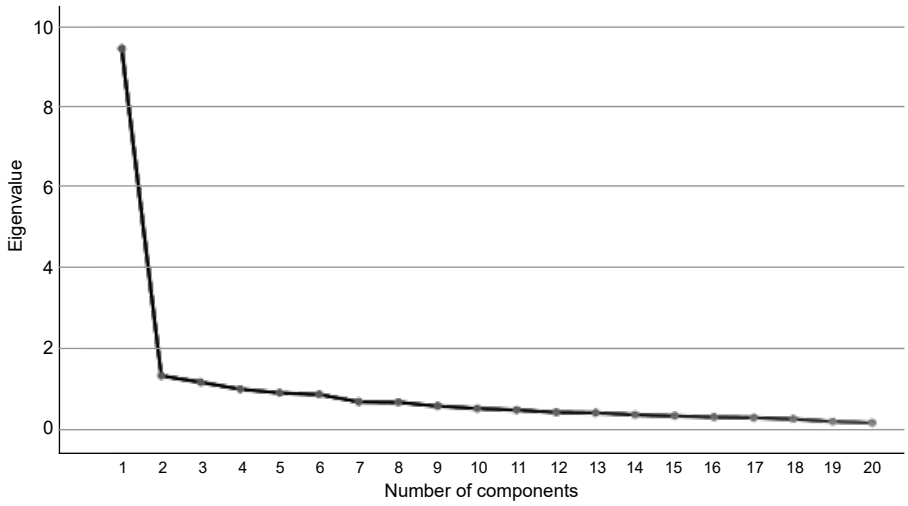

Figure 1. Sedimentation graph of factor components.

Correlations between the items and the total scale were significant ($p < .05$), meaning that the items correspond to each factor differentially. Correlations range from .19 to .76 between the items. Correlations between the total DISRS score and the cognitive-motivational dimensions ($r = .938$, $p < .01$), negative state ($r = .898$, $p = < .01$) and tiredness ($r = .853$, $p < .01$) were statistically significant and with the subscale of depressive symptoms of RRS ($r = .809$, $p < .01$). Additionally, the highest correlations of the ISI scale were found with the RRS scale ($r = .714$, $p < .01$) and the negative state subscale of the DISRS ($r = .715$, $p < .01$), with the rest of scales, the correlations were moderate.

Table 4
Correlations with other study variables

	DISRS	*RRS*	*ISI*	*PSWQ*
DISRS		778**	.648**	.732**
RRS	.778**		.714**	.670**
ISI	.648**	.714**		.610**
PSWQ	.732**	.670**	.610**	
DISRS cognitive	.938**	.767**	.555**	.667**
DISRS negative state	.898**	.723**	.715**	.663**
DISRS tired	.853**	.573**	.489**	.659**
RRS depression	.809**	.971**	.696**	.680**
RRS reflection	.569**	.840**	.633**	.489**
RRS brooding	.698**	.911**	.616**	.632**

** Correlation is significant at 0.01 (bilateral).

Table 5
Results of discriminant classification

	DISRS Group	*Low*	*High*	*Total*
Recount (*n*)	Low	41	10	51
	High	15	36	51
Percentage (%)	Low	80.4	19.6	100
	High	29.4	70.6	100

Note: 75.5 % of original cases grouped together correctly classified.

For discriminant validity, the total scores of the ISI, PSWQ and RRS scales were included in the analysis as independent variables, while the dependent variable was represented by the total scores of the DISRS. The result of the Box M test (33.409, $p < .05$) confirms that the variance-covariance matrices are different; a single discriminant function was determined with an eigenvalue of .638 and a canonical correlation of .624. Wilks' Lambda statistic has a moderate value ($\lambda = .611$, $p < .05$). Standardized canonical coefficients (CCE) helped identify the variables with the greatest weight in the predictive model, yielding the following equation of coefficients: discriminant function (FD) = -3.359 + .33 PSWQ + .89 ISI + .33 RRS. Lastly, the discriminant function correctly classified 77 cases (75.5%) based on worries, insomnia symptoms, and ruminant responses unrelated to sleep difficulty. Individuals with high levels of rumination associated with insomnia had more worries and an unreflective, reproach-oriented thinking style (Table 5).

Mental health: We did not find any statistically significant differences when the average of the scales administered between women and men was compared. DISRS: t (99) = -1.909, $p = .059$; ISI: t (99) = -.786, $p = .434$; PSWQ: t (99) = 1.297, $p = .198$; RRS: t (99) = -1.538, $p = .127$.

DISCUSSION AND CONCLUSION

The purpose of this study was to analyze the psychometric properties of the DISRS scale in a Mexican population sample. The internal consistency, construct validity, convergent validity, and discriminant validity were determined.

The total scores of the scales administered were slightly higher in the group of women than in that of men; it is strik-

ing that over half the participants were female (64.71%). The role played by certain sociodemographic variables in mental health has been reported in previous research. Our results coincide with the evidence on the vulnerability of women to suffering from insomnia, rumination, and excessive worry in relation to men (Krystal, 2003; Johnson & Whisman, 2013).

The version of the DISRS scale translated into Spanish had good internal consistency. The three cognitive-motivational factors, negative state, and tiredness correlated with each other. A certain tendency can be observed to present higher correlation coefficients in the dimension to which the items correspond. The rotated component factor analysis revealed three factors: cognitive-motivational (9 items), negative state (6 items), and fatigue (5 items), which explain 59.5% of the variance; the cognitive-motivational factor explained a large part of this variance with 47.21%, while the other two factors, negative state, and tiredness, together, explain only 12.32% of the variance. For this reason, the authors of the DISRS authors do not recommend the use of these factors as subscales; instead, the total summed score should be used.

The lowest communalities were found in items 18 and 19, which reached values of .365 and .345, respectively. Since construct validity was not significantly modified by eliminating these two items from the factor analysis, it was decided to keep them in the last version of the scale translated into Spanish.

Although the original factorial structure of the instrument was replicated, not all the items coincided in the conformation of the three factors defined by the authors of the scale, this is possibly explained by the variability of some items that make up the scale. The possibility of applying an abbreviated DISRS scale by removing the items from the negative affectivity factor should also be considered in future research (e.g., item 4 "Think about how unmotivated you feel," item 8 "think about how sad you feel," item 9 "think about how you don't feel like doing anything," and item 14 "think, I can't get rid of this feeling") because these items are similar to certain items of the depression subscale of the RRS. The nature of the construct needs to be better studied, in larger samples from general and clinical population, in order to generalize the results.

For convergent validity, questionnaires that evaluate constructs associated with rumination were used, such as the Ruminative Response Scale, the Insomnia Severity Index (ISI) and the Penn State Worry Questionnaire (PSWQ). Although these constructs show appropriate degrees of convergent validity, the highest correlation occurred between DISRS and RRS (r = .78) and PSWQ (r = .73). Evidence from previous studies has shown that depression, anxiety, and worries are chronic, aggravating factors of insomnia (Moberly & Watkins, 2008; Pearson, Watkins, Kuyken, & Mullan 2010), and that they also reduce the quality of life of those affected (Isaacs, Tehee, & Gray, 2021).

The most relevant correlation between the insomnia scale (ISI) and the DISRS factors occurred with the negative state (r = .72), followed by cognitive-motivational (r = .56) and tiredness (r = .49). There is some evidence on the use of rumination to relieve the emotional discomfort that the individuals suffer; however, it does not work in a lasting way, worsening the way of coping with problems because repetitive thoughts would focus on the causes and consequences of such difficulties and not so in the solutions (Hervás & Vázquez, 2006; Gruber, Eidelman, & Harvey 2008). Moreover, Du, Huang, An, and Xu (2018) found that higher level of rumination predicted higher degree of negative emotions experienced and vice versa. Additionally, rumination maintains physiological activation and emotional arousal in response to stressors. They may be the reason why daytime rumination can increase and maintain insomnia problems (Weiner et al. 2021).

Discriminant analysis enables subjects to be classified into two groups: participants with low and high levels of rumination associated with insomnia symptoms. Variable insomnia symptoms had a greater influence on the calculation of the discriminant function (SSC = .089) than worries (SCC = .033) and rumination unrelated to insomnia (SCC = .033). The discriminant function obtained helped classify 77 cases correctly, which corresponds to 75.5% of the total sample. Ten cases were false positives (19.6%) while 15 cases corresponded to false negatives (29.4%). Although the discriminant function is used to classify group membership, it is possible that not all independent variables are discriminant. Since the value of the Wilks' Lambda statistic (λ = .611) denotes certain similarities between the groups, the influence of each of the variables on the discriminant function obtained must be studied.

Since this adaptation constitutes an initial approach to the study of ruminant thoughts and insomnia in Latin America, it would be advisable to follow up the subject to learn more about rumination in different age groups, in addition to finding out about the differences and similarities with the Anglo-Saxon population. In the clinical area, having a valid instrument and translated into Spanish that helps in the diagnosis and rumination clinical follow-up in insomniac individuals would make it easier for health personnel to determine the influence of ruminative thoughts on the effectiveness of pharmacological and psychotherapeutic treatment. In addition, it will permit the identification of and intervention in people prone to rumination and insomnia to encourage them to seek more adaptive cognitive mechanisms that will help solve their problems rather than just frequently thinking about adversity, without acting or finding a solution (Takano, Iijima, & Tanno, 2012; Tousignant, Taylor, Suvak, & Fireman, 2019).

According to the cognitive model of insomnia, repetitive negative thoughts generate an emotional bias and selective attention, in which people exaggeratedly monitor

the threat signals related to sleep, likewise the discomfort caused by difficulty sleeping gets worse thoughts and negative emotions, creating a cycle that perpetuates insomnia. (Harvey, 2002).

Rumination is a repetitive thinking process that limits the processing of external information to solve problems. In other words, a person with a propensity to think negatively tends to have greater difficulty integrating positive information that may distort their deeply ingrained negative beliefs (Lo, Ho, & Hollon, 2010; Carney et al., 2013). Our research suggests that insomniacs respond to daytime insomnia symptoms, repeatedly thinking about how much it bothers them to have unrestful sleep, this cognitive tendency is related to the severity of insomnia. A study carried out in pregnant women found that rumination exacerbates insomnia at night and that these repetitive thoughts would also be presents during the day and would focus on the consequences of not having slept well (Kalmbach, Cheng, & Drake, 2021).

Study limitations include the fact that the sample is unrepresentative, and therefore, the results cannot be generalized to the entire population studied. At the same time, the sample included mostly women, aged between 26 and 40, who live with their partners and have had more than nine years' schooling. It is therefore necessary to determine whether the DISRS scale is also suitable for people with different demographic characteristics. Another limitation, it was not possible to rule out pre-existing pathologies in participants (e.g., depressive disorder, anxiety disorders), nor asking about the current use of medications. For future research, it is suggested to expand the clinical information by performing the physical examination, laboratory and other complementary tests. Finally, we have that the cross-sectional design of our research does not allow us to establish causal associations between variables.

The study concludes that the DISRS scale is valid and reliable for detecting ruminant thoughts related to daytime insomnia symptoms. Given that the DISRS was evaluated with other validated scales to establish convergent validity, future research could evaluate rumination associated with insomnia through other more objective diagnostic tests such as polygraphy and polysomnography. Finally, the authors suggest evaluating the psychometric properties of this tool in a clinical population with medical or psychiatric comorbidities.

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Conflict of interest

The authors declare they have no conflicts of interest.

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APPENDIX
ESCALA DISRS TRADUCIDA AL ESPAÑOL

Instrucciones: La gente piensa y hace muchas cosas diferentes cuando se siente cansada. Lee cada uno de los siguientes enunciados e indica si casi nunca, a veces, frecuentemente o casi siempre piensas o actúas de esa manera cuando te sientes cansado (a). Por favor, indica lo que generalmente haces, no lo que crees que deberías hacer.

Preguntas	*Casi nunca*	*A veces*	*Frecuente-mente*	*Casi siempre*
1. Piensa, “No seré capaz de trabajar porque me siento muy mal”.	1	2	3	4
2. Piensa acerca de sus sentimientos de fatiga.	1	2	3	4
3. Piensa acerca de lo difícil que es concentrarse.	1	2	3	4
4. Piensa acerca de lo desmotivado que se siente.	1	2	3	4
5. Piensa acerca de lo nublado o confusos que son sus pensamientos.	1	2	3	4
6. Piensa acerca de “cómo todo requiere más esfuerzo del usual”.	1	2	3	4
7. Piensa “¿Por qué no puedo seguir adelante?”.	1	2	3	4
8. Piensa acerca de lo triste que se siente.	1	2	3	4
9. Piensa en “Cómo no se siente con ganas para hacer cualquier cosa o actividad”.	1	2	3	4
10. Piensa acerca de sus sentimientos de dolor.	1	2	3	4
11. Piensa en lo mal que se siente.	1	2	3	4
12. Piensa que tan difícil es mantener su mente en una tarea.	1	2	3	4
13. Piensa acerca de lo cansado que se siente.	1	2	3	4
14. Piensa, “No puedo quitarme este sentimiento”.	1	2	3	4
15. Piensa acerca de que tan irritable se siente.	1	2	3	4
16. Piensa acerca de que tan somnoliento (a) o con sueño se siente.	1	2	3	4
17. Piensa, “Parece que no puedo poner atención”.	1	2	3	4
18. Piensa, “Soy muy olvidadizo (a)”.	1	2	3	4
19. Piensa, “No puedo estar cerca de la gente cuando me siento de esta manera”	1	2	3	4
20. Piensa en que no tiene la energía para poder terminar el día.	1	2	3	4
			Puntaje total:	

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Measuring confidence in physician: Adaptation and validation of TPS in HIV individuals from Mexico

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ABSTRACT

Introduction. Patient-physician relationship is associated with ART adherence and medical follow-up in people living with HIV (PLWH). Patient's trust in their doctor is a key component of patient-physician relationship, so adequate and reliable instruments to measure this component are important to evaluate its impact on health outcomes. **Objective.** To evaluate the psychometric properties of a translated and adapted version of Trust in Physician Scale (TPS) in Mexican PLWH. **Method.** A cross-sectional study was carried out in PLWH. Scale was translated to Spanish and culturally adapted. Sociodemographic and TPS data were collected online due to COVID-19 pandemic. Exploratory (EFA) and confirmatory (CFA) factor analysis were carried out in two different samples. **Results.** Data from 215 participants was used to EFA. Five items were eliminated due to low correlation with total scale. Final Cronbach's alpha was .93. A single-factor structure explained 68.8% of the variance. CFA in a sample of 140 participants confirmed adequate fit indices ($\chi^2_{[7]}$ = 13.015 p = .072, CFI = .997, RMSEA = .057, SMRS = .0015). **Discussion and conclusion.** The final scale was unifactorial and it is made up of six items instead of 11. It seems to be a valid and reliable scale to measure patient's trust in doctors in Mexican PLWH. Further studies are recommended to provide evidence of convergent validity to the instrument.

Keywords: HIV, patient-physician relations, trust-in-physician, validation study.

RESUMEN

Introducción. La relación médico-paciente está asociada a la adherencia al tratamiento antirretroviral y al seguimiento médico en las personas que viven con VIH (PVVS). La confianza de los pacientes en sus médicos es un componente clave de la relación médico-paciente, por lo que es importante disponer de instrumentos adecuados y fiables para medir este componente y evaluar su impacto en los resultados de salud. **Objetivo.** Evaluar las propiedades psicométricas de una versión traducida y adaptada de la Trust in Physician Scale (TPS) en PVVS mexicanas. **Método.** Se realizó un estudio transversal en adultos con VIH. La escala fue traducida al español y adaptada culturalmente. Los datos sociodemográficos y de la TPS se recogieron en línea debido a la pandemia de COVID-19. Se realizaron análisis factoriales exploratorios (AFE) y confirmatorios (AFC) en dos muestras diferentes. **Resultados.** Se utilizaron los datos de 215 participantes para el AFE. Se eliminaron cinco ítems debido a la baja correlación con la escala total. El alfa de Cronbach final fue de .93. Una estructura unifactorial explicó el 68.8% de la varianza. El AFC en una muestra de 140 participantes confirmó la adecuación del modelo mostrando índices de ajuste adecuados ($\chi^2_{[7]}$ = 13.015 p = .072, CFI = .997, RMSEA =.057, SMRS = .0015). **Discusión y conclusión.** La escala final fue unifactorial y se compuso de seis ítems en lugar de 11. Parece ser una escala válida y fiable para medir la confianza del paciente en los médicos en PVVS mexicanas. Se recomiendan más estudios para buscar evidencia de validez convergente del instrumento.

Palabras clave: VIH, relación médico-paciente, confianza en el médico, estudio de validación.

INTRODUCTION

Patient-physician relationships have been widely studied in the context of chronic health problems. For people living with HIV (PLWH), being seen by different doctors each time or exposure to negative attitudes, like stigma, discrimination or prejudices, shown by medical staff can lead to poor outcomes such as inadequate adherence to antiretroviral treatment (ART) or loss of follow-up (Kuznetsova et al., 2016; Westergaard, Hess, Astemborski, Mehta, & Kirk, 2013). On the other hand, positive experiences with health professionals, health professionals who respond to the emotional needs of patients, satisfaction with one's doctor and belief in the physician's competence, have been reported as facilitators for an adequate medical follow-up (Brincks, Feaster, Burns, & Mitrani, 2010; Hurley et al., 2018; Kuznetsova et al., 2016; Yehia et al., 2015).

As a general construct, patient-physician relationships can include different components, such as patient's satisfaction with care, physician's communication style or agreement between the patient and physician (Brincks et al., 2010; Honavar, 2018). A determining factor in the patient-physician relationship is patients' trust in their doctors (Hall, Dugan, Zheng, & Mishra, 2001; Hall et al., 2002). In this sense, in individuals with chronic illness, trust in their doctors has been associated with positive health outcomes, treatment compliance and adherence to doctors' recommendations (Kerse et al., 2004; Piette, Heisler, Krein, & Kerr, 2005). Similar associations between trust in physicians and adherence to medications and treatment have been found in people living with HIV (Graham, Shahani, Grimes, Hartman, & Giordano, 2015; Roberts, 2002; Schneider, Kaplan, Greenfield, Li, & Wilson, 2004; Whetten et al., 2006), in which adherence to treatment have an impact not only on individual health (Gebrezgabher et al., 2017) but also on public health, preventing transmission of the virus (Skarbinski et al., 2015) or development of drug resistance (Almeida et al., 2014).

The Trust in Physician Scale (TPS; Anderson & Dedrick, 1990) is a psychometric test that measures the patient's trust in their doctor and consists of 11 items measured in a five-point Likert format with response options ranging from "strongly agree" to "strongly disagree." The instrument has shown adequate internal consistency (Cronbach's alphas between .85 - .90) and construct and predictive validity (Thom, Ribisl, Stewart, & Luke, 1999). When used in PLWH, it has shown adequate psychometric characteristics (Piette et al., 2005). Trust in doctor measured with this instrument was significantly related to patients' desires for control in their patient-physician interactions and to subsequent satisfaction with care (Anderson & Dedrick, 1990).

The instrument has been used in different studies (Aloba, Mapayi, Akinsulore, Ukpong, & Fatoye, 2014; Freburger, Callahan, Currey, & Anderson, 2003; Kalsingh, Veliah, & Gopichandran, 2017) but to date, it has not been validated in Spanish for use in a Mexican population. Considering the important relationship between this construct, adherence to ART and quality of life in PLWH, and the fact that in Mexico, inadequate adherence rates between 40% and 50% have been reported (Peñarrieta et al., 2009; Plascencia de la Torre et al., 2019), it is considered relevant to improve knowledge about trust in physician for which it is essential to have adequate and reliable instruments to evaluate it. We thus adapted and validated the TPS to Spanish and evaluated its psychometric properties in a sample of people living with HIV in Mexico.

METHOD

Design of study

Cross-sectional study, data of this study was part of a larger study aimed to assess which sociodemographic, clinical, contextual, behavioral, psychological, and care-related variables were associated to loss to follow-up in people living with HIV.

Participants and place

Participants of the study were people living with HIV, over 18 years of age, receiving care at an HIV healthcare clinic inside a third-level hospital in Mexico City and who agreed to participate in the study. Due to COVID-19 related restrictions, the test was applied online. Invitations to participate in the study were sent by email to patients receiving care in the HIV clinic. E-mails were in database of the HIV clinic and were used as a routine form of contact with patients. They had previously authorized the use of their e-mail addresses to send them information, including invitations to research protocols. Invitations were also posted on the clinic's social networks (Facebook and Twitter). A sample size of at least 10 participants by item was established to perform the exploratory factor analysis (EFA) and 20 participants by item to perform the confirmatory factor analysis (CFA; Boateng, Neilands, Frongillo, Melgar-Quiñonez, & Young, 2018; Nunnally, 1978).

Measurements

The sociodemographic variables age, gender, marital status, and educational level were collected. Participants were also asked if they were taking antiretroviral therapy (ART) and how many months had passed since their diagnosis.

To measure trust in physician, the adapted TPS (Anderson & Dedrick, 1990) was used. The original scale is composed of 11 items (seven written in direct form and four in inverse form). Each item contains five response op-

tions ranging from strongly disagree ("1") to strongly agree ("5"). Scores range from 11 to 55, with higher scores indicating greater trust in the physician.

Procedure

Three HIV-specialized psychologists independently translated the TPS from English to Spanish for Mexico and made the cultural adaptation to the clinic's HIV patients. Translations were compared, reaching agreements on the discrepancies. This version was back-translated into English by a bilingual health professional outside of the study team to ensure the meaning of the items was maintained in the Spanish translation. Following the suggested procedure (Reyes Lagunes & García y Barragán, 2008), a pilot study was conducted with 10 participants to ensure understanding of the items and instructions, only one person had doubts in two of the items. They were carefully reviewed by three expert psychologists, and since no difficulties were found in those items, and the rest of the participants in the pilot test did not report any difficulties, it was concluded that the lack of understanding could be due to the person and not to the items.

Data from first sample to carried out the EFA was collected online between April and May 2020; and data from second sample to carried out the CFA was collected between November 2020 and May 2021. As participation was anonymous, to ensure that the respondents were the target population, they were asked if they were living with HIV, in case they did not self-report HIV, the responses of these participants were eliminated. Respondents were then directed to fill a sociodemographic questionnaire and to fill out the translated and adapted version of TPS. This version was also composed of 11 items (direct and inverse) containing five response options ranging from strongly disagree ("1") to strongly agree ("5").

Statistical analysis

Items that were written inversely to measure confidence (1, 5, 7 and 11) were recoded. Frequencies, percentages, means, standard deviation (SD), medians and inter-quartile ranges (IQR) were used to describe sociodemographic variables. Intra-variability for each participant was calculated to eliminate those who had responded exactly the same to each item or who had a response pattern. Outliers were explored through box and whisker plots; skewness values were expected to be less than |1| and kurtosis values less than |2|. The frequency of the response options in each item was examined, paying attention to those with more than 50% or more than 30% in the extreme answer options. To confirm the adequacy and variability of the sample, the Kaiser-Meyer-Olkin (KMO) value (expecting it to be > .70) and the Bartlett test of sphericity (expecting it to be significant, $p > .001$) were calculated before carrying out the exploratory factorial analysis (Thompson, 2008).

For psychometric properties, in the first sample reliability was evaluated with Cronbach's alpha internal consistency index (expecting it to be greater than .80). We expected the item-scale correlation to be greater than .35 in all items and that Cronbach's alpha did not increase when eliminating any of them (DeVellis, 2017). Construct validity was evaluated with EFA, using the principal axis factoring, expecting factor loadings > .40 and an explained variance > 45% (Osborne, 2014). These analyses were performed using IBM® SPSS® Statistics Version 26. CFA was performed in the second sample using AMOS® Version 24. A single-factor model was tested with the solution provided by the EFA. Several fit indices were calculated: the model χ^2 and its p value, expecting it to be non-significant (> .05); the root mean square error of approximation (RMSEA), where values < .05 represent an excellent fit, and values < .08 represent an adequate fit; the standardized root mean square residual (SRMR), in which values less than or equal to .08 indicate good fit; and the Comparative Fit Index (CFI); where values greater than or equal to .95 indicate a good fit (Bentler, 1990; Browne & Cudeck, 1992).

Ethical considerations

This study was performed in line with the principles of the Declaration of Helsinki. Research Board of the Instituto Nacional de Enfermedades Respiratorias (INER) review the study and approved online informed consent (approval number C02-20). The answers of participants were anonymous; therefore, their confidentiality was assured. Informed consent was obtained after explaining in writing the purpose of the study and having them answer the question: Do you agree to participate in the study? If they answered no, the questionnaire did not continue.

RESULTS

In the sample used to conduct EFA, responses were received from 251 participants who answered the TPS. A total of 36 questionnaires were eliminated: 26 due to lack of variability in the answers, six because they had a response pattern, and four because they belonged to participants who were not living with HIV. Final analyses were carried out with responses from 215 participants. The vast majority (n = 207, 96.3%) were male participants, in line with the sex distribution of PLWH receiving care at the clinic where the study was carried out. Mean age was 32.45 years (SD = 7.73). More than half were single (n = 156, 72.6%) and had higher education (n = 129, 60.1%). The majority was taking ART (n = 210, 97.7%) and the median of months after diagnosis was 41

Table 1
Sociodemographic characteristics of study participants (n = 215)

Age	
Mean	32.45
SD	7.731
Range	18-50
Gender % (n)	
Male	96.3 (207)
Female	3.7 (8)
Marital status % (n)	
Single	72.6 (156)
Married	5.1 (11)
Separated/Divorced	20.0 (43)
Cohabitation/Civil union	1.4 (3)
Widowed	.9 (2)
Educational level % (n)	
Basic education	4.6 (10)
High school education	35.3 (76)
Higher education	60.1 (129)
Taking ART % (n)	
No	2.3 (5)
Yes	97.7 (210)
Months since diagnosis	
Median	41
IQR	20-89

Notes: SD: Standard deviation; IQR: Interquartile range.

(IQR = 20-89). Table 1 describes the sociodemographic variables of the participants.

Data scanning: items analysis

In the sample used to conduct EFA no outliers were found. Skewness values were less than |1| in every item, and kurtosis values were less than |2|, thus items were distributed normally. No response option had a frequency higher than 50%. However, in four questions (3, 6, 9 and 11) the extreme option "totally agree" had more than 30% of the answers, so these items could benefit from more answer options. Finally, it was found that all items were able to discriminate between extreme groups (quartile 1 and 3, $p < .001$), so none had to be eliminated.

Reliability

In this first sample ($n = 215$) correlational analysis were performed, the items 11, 1, 7 and 5 had a low correlation with the total scale (.225, .250, .357, .305 respectively) and were eliminated. When item 8 was eliminated, Cronbach's alpha increased, so it was also removed from the test. Items were removed one by one until all items had a correlation with the scale of at least .35 and Cronbach's alpha did not increase when they were removed. Table 2 shows the final item-scale correlation values of the items that were maintained, these range from .728 to .852. The Cronbach's alpha coefficient for the six remaining items of the TPS scale was .93 for the overall scale, showing good internal consistency.

Table 2
Correlations of the six remained items of TPS with total scale (n = 215)

Item	TPS2	TPS3	TPS4	TPS6	TPS9	TPS10
Correlation	.772	.815	.764	.852	.832	.728

Table 3
Factor loadings of items of TPS (n = 215)

Item	*Mean*	*SD*	*Factor loading*	*Communality*
TPS2	3.42	1.276	.894	.650
TPS3	3.85	1.192	.864	.732
TPS4	3.66	1.208	.855	.640
TPS6	3.71	1.253	.806	.799
TPS9	3.66	1.305	.800	.747
TPS10	3.40	1.363	.756	.572

SD: Standard deviation

Construct validity

Adequacy of the first sample ($n = 215$) was tested using EFA trough the KMO value of .902, and Bartlett's test of sphericity of $\chi^2(15) = 989.47$, $p < .001$, thus confirming adequacy and variability of the sampling. EFA results showed one factor with eigenvalue > 1, suggesting a unidimensional structure. Factor loading of all six items was over .40, so no more items were excluded. A one-factor solution explained 68.9% of the total variance, which is considered very acceptable. In Table 3, factor loading scores are shown, all of them ranging from .756 to .894.

In order to confirm the factor structure of TPS, a model with six items and a single factor was tested by CFA in a

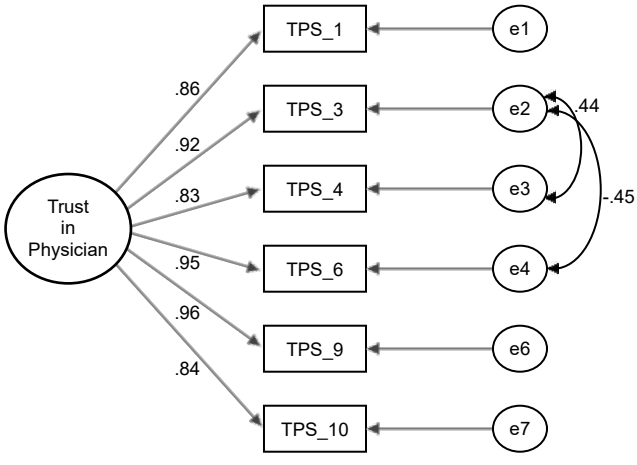

Figure 1. CFA of Trust in Physician Scale.

Table 4
Mean and standard deviation of significant groups (n = 355)

	Total sample	Men	Women	Less than 35 years	35 to 50 years	More than 50 years
Mean	22.95	22.86	24.68	22.26	23.20	24.47
SD	6.800	6.822	6.325	6.434	7.228	6.583

SD: Standard deviation.

second sample of 140 participants. An $\chi^2_{(7)} = 10.19$ $p = .178$ was obtained, indicating good fit. The rest of the indices were then calculated to check the model fit; the RMSEA value was .057 $p = .376$, the SRMR was .0015 and the CFI was .997, all of them showed an adequate model fit. All factorial weights were high, ranging from .84 to .96. In figure 1 the model obtained with CFA is showed.

Sample scores

The Spanish version adapted for Mexico of TPS instrument consisted of six items, instead of 11, with a score ranging from 6 to 30. When comparing in the first sample ($n = 215$) the score obtained with the adapted version and the score obtained with the original version, a very high correlation is obtained ($r = .990$, $p < .001$), which indicates that even if some items are eliminated, the construct being measured does not change. With this adapted TPS version, the mean score obtained by all participants (joining both samples, $n = 355$) were 22.95 (SD = 6.80). Fourteen people obtained the lowest score in trust in his physician (3.9%) and 63 people obtained the highest score (17.7%). No significant differences were found between men and women regarding their score ($t_{[353]} = 1.14$, $p = .255$), nor between the different age groups ($F_{[2,352]} = 2.29$, $p = .102$). Table 4 shows means and standard deviation of the scores by sex and age group.

DISCUSSION AND CONCLUSION

The TPS translated and adapted in a sample of people living with HIV from Mexico was shown to be a valid and reliable instrument, consistent with the original scale (Anderson & Dedrick, 1990). The translated and adapted version was still an unifactorial scale, although it was composed by six of the 11 items of the original scale. The score that can be obtained with this adaptation ranges from 6 to 30, with higher scores indicating greater confidence in the doctor. Scores of adapted version correlated with the ones obtained with the original instrument, suggesting that they measure the same psychological construct. The final internal consistency index was also adequate (Cronbach's alpha = .93), even higher than those found in other studies (Aloba et al., 2014; Freburger et al., 2003; Kalsingh et al., 2017) and similar to that of the original instrument (Anderson & Dedrick, 1990). The adapted version of TPS remained unifactorial, like the original instrument (Anderson & Dedrick, 1990), and explained a very high percentage of variance (almost 70%). All items were correlated with each other and had high factorial loads. These results were confirmed in a second sample by confirmatory factor analysis, which obtained adequate fit indices, showing the adapted TPS to be a reliable and valid instrument to measure patients' trust in their doctors. This may be because the population of this study is similar to the population in which the original instrument was developed, which were adults with diabetes, another chronic disease that involves regular treatment and in which the relationship with the physician is key.

In our adapted scale, items that had a very low correlation with the total scale, which curiously coincided with the inverse items of the original scale, were removed. Inverse items (which contain negative statements, or they measure the construct in the opposite direction to the rest of the instrument) may create confusion in certain populations, especially those with low levels of education or scarce resources, leading to inconsistencies with the rest of the scale, and this may have happened for our study population. Although these items do not show lower correlation with the total test in the original instrument, other authors have also had issues with these items, Aloba and collaborates concluded they may belong to a different factor than the rest of the items (Aloba et al., 2014). To tease out these hypotheses, the translated scale could be tested with the inverted items in the same direction as the rest. Despite the elimination of these five items, the correlation between the two versions (adapted and original) is very high, suggesting that they still measure the same construct, and thus making the adapted TPS version an even simpler and shorter instrument, which can be especially useful for use in resource-poor settings, as is the situation in most of Mexico.

The instrument showed a variable spread of answers across the trust spectrum. No differences were found in the level of trust in physician between men and women, although participants were mostly male and the study did not have the power to detect differences between genders. Likewise, no differences were found in the trust score by age group, similar with what was found in other studies (Kayaniyil et al., 2009; Muir et al., 2009), probably because age does not affect the level of trust in the physician, and it is probably other variables included in the doctor-patient relationship that have a greater effect on this construct. The study did not capture data on the patients' main physician or other potential key variables that could be associated with the observed variability, and it would be important for future studies to address them.

The level of trust in the physician found in this study is considered generally adequate, although at the moment

there are no cut-off points for this construct. There are more patients who fully trust their doctors than those who scored the lowest. This would contribute to explain the very good rates of adherence to ART in this population, where the vast majority showed ART adherence of more than 95%. "Trust in the doctor" and "patient-physician relationship" in people living with HIV are very relevant elements because they are related to better commitment to care (Freburger et al., 2003), better health outcomes, better adherence to treatment and better clinical follow-up (Hall et al., 2002; Hurley et al., 2018; Mechanic & Meyer, 2000; Safran et al., 1998), which implies important benefits for individual and public health.

Limitations of the study include that it had to be carried out online due to the COVID-19 pandemic. This can bias the study by excluding people with no Internet access, who don't follow the clinic's social networks, or had not provided their email. Also, in online surveys it cannot be controlled who answers the questionnaire, because of that, and to minimize the risk of responses were not from the target population, an HIV self-reporting question was included. Another limitation could be the relatively small sample size, it could be important to test the translated and adapted version of TPS in other Spanish-speaking populations of people living with HIV in Mexico.

The Spanish for Mexican translated and adapted version of the TPS has proven to be a reliable and valid instrument, with adequate psychometric properties and good model fit indices in people living with HIV. A reliable instrument to measure this variable can be key to detect and resolve trust issues in patient-physician relationships in a timely manner. When trust issues will be detected, they may benefit from interventions by mental health professionals, trainings, and workshops to improve patient-physician relationship and confidence in doctors and health system. While more studies are necessary to verify the construct and convergent validity of this instrument, results suggest that the adapted and translated TPS can be a useful, brief and easy-to-use tool to assess trust in doctors among Mexican people living with HIV.

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Conflict of interest

The authors declare they have no conflicts of interest.

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Association of loneliness, social isolation, and daily cognitive function in Mexican older adults living in community during the first wave of COVID-19 pandemic

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ABSTRACT

Introduction. Loneliness and social isolation are known risk factors for cognitive decline; their effect in older adults (OA) after COVID-19 lockdown is emerging. **Objective.** To establish an association between loneliness and social isolation, with daily cognitive function in Mexican OA during the first wave of the COVID-19 pandemic. **Method.** Cross-sectional study, derived from the cohort "The impact of COVID 19 on well-being, cognition, and discrimination among older adults in the United States and Latin America", which included 308 OA recruited between March-August 2020 whose daily cognitive function were determined with the Everyday Cognition Scale (E-Cog) as dichotomized score (cut point: 1.31 for normal cognition). Loneliness and social isolation were binomial variables. **Results.** The mean age was 65.4 ± 7.9 years, 75.7% were women. The mean continuous E-Cog score was 57.4 (SD = ± 19.1), 49.1% had a score < 1.31 (normal cognition), while 50.9% had a higher score (cognitive impairment). Eighty four percent of participants reported loneliness, 79.9% reported social isolation. Multivariate regression model showed a negative and statistically significant association between social isolation and loneliness and E-Cog, adjusted by age, sex and education level (β = -.046, 95% CI = [-.8, -.013], p = .007; β = -.16, 95% CI = [-.08, -.018], p = .003), and a positive association with subjective memory complaint (β = .81, 95% CI = [-.16, -.11], p = < .001). **Discussion and conclusion.** These data suggest the need for increased vigilance of those who have loneliness and social isolation due to its potential deleterious effect on cognitive function.

Keywords: Loneliness, social-isolation, cognition, aged, COVID-19.

RESUMEN

Introducción. La soledad y el aislamiento social son factores de riesgo conocidos para el deterioro cognitivo; su efecto en las personas mayores (PM) después del confinamiento por COVID-19 está emergiendo. **Objetivo.** Establecer una asociación entre la soledad y el aislamiento social, con la función cognitiva diaria en PM mexicanas durante la primera ola de la pandemia por COVID-19. **Método.** Estudio transversal derivado de la cohorte "The impact of COVID 19 on well-being, cognition, and discrimination among older adults in the United States and Latin America", incluyó 308 AM reclutados de marzo-agosto 2020, la función cognitiva diaria fue evaluada con Everyday Cognition Scale (E-Cog) con un punto de corte 1.31 (cognición normal); la soledad y el aislamiento social fueron variables binomiales. **Resultados.** La media de edad fue 65.4 ± 7.9 años, 75.7% mujeres. E-Cog promedio fue 57.4 (DE = ± 19.1), 49.1 % tenía una puntuación < 1.31 (cognición normal), 50.9% > 1.31 (deterioro cognitivo). Ochenta y cuatro por ciento de los participantes reportaron soledad, 79.9% aislamiento social. El modelo de regresión multivariado mostró una asociación negativa y estadísticamente significativa entre aislamiento social y soledad con E-Cog (β = -.046, IC 95% = [-.8, -.013], p = .007; β = -.16, IC 95% = [-.08, -.018], p = .003), y una asociación positiva con queja de memoria subjetiva (β = .81, IC 95% = [-.16, -.11], p = < .001) ajustado a edad, sexo y escolaridad. **Discusión y conclusión.** estos datos sugieren la necesidad de una mayor vigilancia de quienes presentan soledad y aislamiento social debido a su potencial efecto deletéreo sobre la función cognitiva.

Palabras clave: Soledad, aislamiento social, cognición, ancianos, COVID-19.

INTRODUCTION

The pandemic caused by SARS-CoV2, the etiologic agent of COVID-19, represents an unprecedented social on April 2022, there have been 5, 950, 424 accumulated cases and 337, 435 deaths related to COVID-19 since the pandemic began. Lockdown started on March 23rd, 2020, and it extended over a year, with a peak (average number of infections per day) on January 20th, 2021 (Secretaría de Salud, 2020).

Since older adults (OA) were particularly susceptible to develop severe manifestations of the disease and complications that increase disability and decrease quality of life (Sepulveda-Loyola et al., 2020), it was a priority that this population sector remains isolated as an effective prevention strategy; however, this represented a new challenge for older adults' mental health. At this point, two different terms must be introduced: a) Social isolation, which is defined as having low quality of contact with others; it is objective and can be measured using observations of an individual's social network (Freedman & Nicolle, 2020) , b) Loneliness, which refers to the adverse emotional state experienced subjectively related to the perception of unsatisfied intimate and social needs (Luanaigh & Lawlor, 2008).

Prevalence suggests that nearly one-third of older adults experience loneliness and/or social isolation, and a subset (5%) reports often or always feeling lonely (Kotwal et al., 2021). Although loneliness does not have the status of a clinical disease by itself, it is associated with several negative health outcomes like stress, sleep disturbances, depressive symptoms, cognitive impairment, coronary heart disease, stroke, and mortality (Akhter-Khan et al., 2021).

On the other hand, partial or total restriction of social interaction could generate negative consequences for the health of OA, especially in those with chronic diseases, disabilities, and geriatric syndromes (Sepulveda-Loyola et al., 2020).

Social isolation may cause impairment in social recognition memory, thereby potentially increasing risk of long-term perceptions of loneliness (i.e., animals exposed to social isolation later have difficulties with social recognition; Mumtaz, Khan, Zubair, & Dehpour, 2018). However, it does not affect other types of memory. This may be related to the specific neural network which processes social information in the mammalian brain which includes: olfactory bulbs, medial nucleus of the amygdala, lateral septum, and the pyramidal layer of neurons of the hippocampus which makes a trajectory in the shape of an inverted C, specially in the region called CA2 (Leser & Wagner, 2015).

We aim to examine the influence of loneliness and social isolation in daily cognitive function in a sample of Mexican older adults living in the community during the first wave of COVID-19 pandemic lockdown and assess characteristics associated with loneliness.

METHOD

Design of the study

Cross-sectional study derived from the cohort "The impact of COVID 19 on well-being, cognition, and discrimination among older adults in the United States and Latin America." carried out in a population of non-institutionalized people aged 55 or older. A non-probabilistic sampling was performed, selecting, for convenience, those in the United States, as well as several in Spanish and Portuguese-speaking countries of Latin America. A detail description of the methodology is summarized in the study by Babulal (2021).

Participants

For this study, we included participants who resided in Mexico (n = 308), during the first six months of lockdown (March–August, 2020). Those who completed the previously described surveys in the first stage or baseline of the SARS-CoV2 pandemic were chosen. All participants completed a one hour-long survey (online with a computer or smartphone or through a phone call with a trained researcher, for help) which was conducted in Spanish. Collected data were managed using the REDCap (Research Electronic Data Capture) tool, a software designed for the research data capture which is located at the Massachusetts General Hospital (Harris et al., 2009). All measurements were translated to Spanish following the World Health Organization guidelines to ensure accuracy.

Dependent variable

Systematic assessment of daily cognitive function offers the potential to improve our understanding of the determinants of functional decline, specific cognitive impairments (Tomaszewski Farias et al., 2011), mild changes in daily function and daily cognition frequently occur in the early stages of neurodegenerative diseases, including during the stage of mild cognitive impairment (MCI; Hsu et al., 2017). Thus we assessed them with the Everyday Cognition Scale (E-Cog). This validated instrument in spanish, has been designed to subjectively assess cognitive and functional abilities, an improvement if compared to its performance 10 years ago. It exhibits excellent psychometric properties including good test–retest reliability (r = .82, p = < .001). It also provides evidence of various aspects of validity such as content and construction as well as convergent, divergent, and external validity. E-Cog comprises 39 items through which six cognitive domains are evaluated, and they are: memory, language, visuospatial, and perceptual abilities and executive functioning (subdivided into planning, organization, and divided attention). Each item is rat-

ed using a four-point Likert scale that ranges from 1: better or no change, to 4: consistently much worse (Table 1 in the supplement; Farias et al., 2008). Each functional domain was defined by the underlying cognitive abilities thought to be the most critical to those daily living activities, higher score indicates greater deterioration (Russo et al., 2018).

This scale can be applied directly to the patient (E-Cog) or to their informant (iE-Cog); There are two ways to report the result: a) continuous score: sum between 1 and 4, the total score is divided by the total number of questions answered, thus creating an average score, taking into account the missing data; b) dichotomized score: the suggested cut-off point based on a cross-sectional comparison of the ADNI to discriminate between normal cognition and cognitive impairment is 1.31 for the participant and 1.36 when applied to the informant, which is obtained from the average (continuous score) divided among six total domains evaluated, obtaining a mean of the total average of the scale (van Harten et al., 2018).

Independent variable

Loneliness: The De Jong Gierveld Loneliness Scale (De Jong Gierveld & Tilburg, 2006), measures emotional (items 1, 5 and 6) and social loneliness (items 2, 3 and 4) by three items each, with a total of six items for general loneliness. Participants select an answer from four options which are: "yes", "more or less", "no" or "no answer". Negatively worded items were inverted; afterward these item scores were added to obtain a total for each participant. Higher scores indicate greater loneliness.

Social isolation: The Epidemic-Pandemic Impacts Inventory (*EPII*; Grasso, Briggs-Gowan, Ford, & Carter, 2020), is a questionnaire developed and designed to assess the personal impact of the coronavirus pandemic in various domains of personal and family life. The EPII consists of 92 items in 10 categories that assess employment (11 items), education (2 items), home life (13 items), social activities (10 items), economy (5 items), emotional health and well-being (8 items), physical health (8 items), physical distancing and quarantine (8 items), history of infection (8 items), and positive change (19 items). For the present study, the subscale of physical distancing and quarantine was used. The responses were summed (yes versus no), and the mean of this subscale was calculated. A higher number in the score suggests a higher load/difficulty.

Subjective Memory Complain: The 7-Memory questionnaire has been validated to assess cognitive changes in older people (Filshtein et al., 2020; Go et al., 1997), and the answers consist of "yes" or "no" according to the subjective memory complaint. The responses were summed to obtain a maximum score of 7. Higher scores represent a greater subjective memory complaint.

Table 1
Participants sociodemographic and general characteristics (n = 308)

Age, years, *mean (± SD)*	65.4	(7.9)
Male /Female, *n (%)*	75 (24.3) / 233 (75.7)	
Education, years *mean (± SD)*	15	(3.0)
Marital status, *n (%)*		
Single	53	(17.2)
Married / civil union	150	(48.7)
Divorced / living alone	60	(19.5)
Widowed	45	(14.6)
Working status, *n (%)*		
Employed	79	(25.9)
Unemployed	31	(10.2)
Retired	101	(33.1)
Housewife	65	(21.3)
Other	29	(9.5)
Good self-perception of health, *n (%)*	294	(95.6)
Drugs, *n (%)*		
0 - 4	301	(97.7)
5 or more	7	(2.3)
Comorbidity		
Systemic Arterial Hypertension	98	(31.8)
Diabetes Mellitus	50	(16.2)
Gastrointestinal	36	(11.6)
Depression	29	(9.4)
Hypothyroidism	28	(9.0)
COVID-19-Symptoms, *n* (%)	26	(8.4)
Questionnaires		
De Jong Gierveld Loneliness Scale		
Loneliness [n (%)] / Total positive items (mean ± SD)	259 (84.0) / 4.13 (1.1)	
1 - 2	12	(3.9)
3 - 4	154	(49.8)
5 - 6	93	(30.1)
EPII Physical Distancing and Quarantine		
Social isolation [n (%)] / Total positive items (mean ± SD) Self-report	246 (79.9) / 1.99 (1.5)	
1 - 3	180	(58.3)
4 - 6	55	(17.8)
7 - 8	2	(.6)
7-Memory Questionnaire		
Subjective Memory Complaint [n (%)] / Total positive items (mean ± SD)	226 (73.1) / 2.28 (2.0)	
1 - 3	132	(42.7)
4 - 7	92	(29.8)
Everyday Cognition Scale (E-Cog)		
Cognitive domains *(mean ± SD)*	Global	Average[a]
Memory	14.1 (5.5)	1.2 (.4)
Language	13.7 (5.0)	1.3 (.4)
Visuospatial	9.1 (3.1)	1.3 (.5)
Planning	6.3 (2.2)	1.5 (.72)
Organization	8.1 (3.2)	1.7 (.68)
E-Cog total score[a]	57.6 (18.8)	1.4 (.49)

[a] *Average score:* E-Cog global divided by the number of items of each domain; final average score was obtained from the sum of the means of each domain divided by six.

Sociodemographic and clinical variables

Information on age, gender, marital status, educational level by years of education, occupation, self-perception of health status, self-reported comorbidities, and the use of medications were included.

Statistical analysis

Descriptive statistics using arithmetic means, standard deviations, frequencies, and proportions examined in sociodemographic and health variables was performed, categorical variables were compared using χ^2 and T test in the case of continuous variables. The presence of loneliness, social isolation, and subjective memory complaint (SMC) were binomial variables. Rho Spearman correlations were examined to establish the relationship between the E-Cog total score as well as the outcome measures. In order to determine the association between loneliness, social isolation, and SMC with E-Cog, participants were categorized with using the cut-off point suggested by van Harten et al. (2018) those with a score < 1.31 indicating normal cognition, final average score was obtained from the sum of the means of each domain divided by six. Univariate linear regression models were later adjusted for potentially confounding variables (age, sex, and education) on multivariate linear regression. A value of $p < .05$ was considered statistically significant. All statistical analyses were conducted using SPSS version 25.0 for MAC (Chicago, IL, USA), figures were made with RStudio (R version 4.1.0, RStudio, Inc., Boston, MA).

Ethical considerations

All participants gave their consent online to be included. This study was approved by the Institutional Ethics Research Committee of the National Institute of Medical Sciences and Nutrition Salvador Zubirán (Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán, INCMNSZ) with the registration ID: GER-3410-20-21-1.

RESULTS

From a total of 308 participants, three participants were excluded for incomplete surveys. Finally, 305 participants were included for statistical analysis from which 75.7% were women (n = 233) with a mean age of 65.4 years (SD = ± 7.9), only 8.4% reported COVID-19 symptoms. Most subjects were married/civil union (48.7%). Those who lived alone were distributed within the following groups: single (17.2%), widowed (14.6%), and divorced/living alone (19% / 48%). The average years of education was 15 (SD = ± 3.0). In terms of occupation, most participants were retired (33.1%), followed by economically active people (25.9%) and housewives (21.3%) (Table 1).

Up to 84.0% (n = 259) had loneliness with a mean affirmative item in the De Jong Gierveld Loneliness scale of 4.13 (SD = ± 1.1) while 79.9% (n = 246) of the participants identified themselves with social isolation using the EPII scale (Table 1). On the other hand, the E-Cog total score was 57.6 (SD = ± 18.8) and average score 1.4 (SD = ± 0.49) with the following highest scores for these cognitive domains: memory (14.1, SD = ± 5.5), language (13.7, SD = ± 5.0), and visuospatial (9.1, SD = ± 3.1).

Table 2
E-Cog distribution with cut-off point

n = 305	*E-Cog < 1.31 [n:150 (49.1%)]*	*E-Cog > 1.31 [n:154 (50.9%)]*	*p*
Loneliness	110 (73.33)	118 (76.62)	
Affirmative items			.09
1 - 2	48 (32.0)	52 (33.76)	
3 - 4	44 (29.33)	31 (20.12)	
5 - 6	18 (11.53)	35 (22.72)	
Social isolation	107 (71.33)	135 (87.66)	
Affirmative items			.01
1 - 2	69 (46.0)	72 (46.75)	
3 - 4	29 (19.33)	51 (33.11)	
5 - 7	9 (6.0)	12 (7.79)	
Subjective memory complaint	81 (54.0)	139 (90.2)	
Affirmative items			< .001
1 - 2	58 (34.66)	32 (20.77)	
3 - 4	20 (13.33)	62 (40.25)	
5 - 7	3 (2.0)	45 (29.22)	
COVID-19 symptoms	10 (6.66)	16 (10.38)	.24

Note: Variables were compared with χ^2.

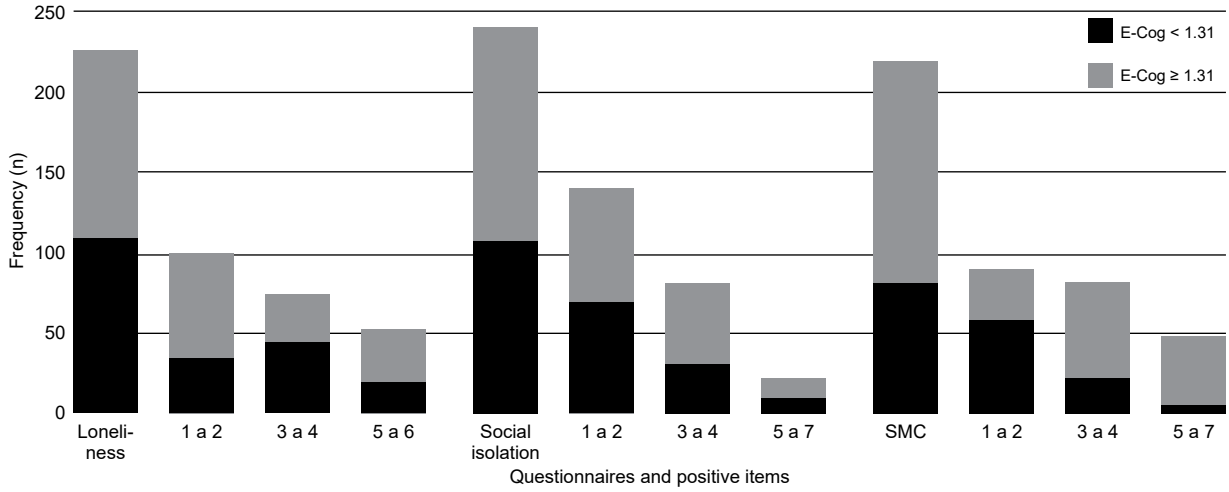

Figure 1. *Distribution of participants:* Participants with worse cognitive performance as measured by E-Cog are shown in grey, while participants with normal performance are shown in black columns. Greater loneliness, isolation, and subjective memory complaint are observed in participants with a score > 1.31.

While 73.1% of the participants reported memory complaint, evidenced with affirmative items in the 7-Memory Questionnaire, the mean affirmative items were 2.2 (SD = ± 2.0), and the major complaints were: in difficulty of remembering things from one second to the next (48.9%) and remembering a short list of items (43.3%).

Loneliness scale (rho .219, p = < .005), EPII Physical Distancing and Quarantine (rho .178, p = < .05) and SMC (rho .68 p = < .001) showed positive Spearman correlation.

Using the cut-off point suggested by van Hartel et al. (2018), 49.1% (n = 150) had a score < 1.31 indicating normal cognition, while 50.9% (n = 154) had a higher score, corresponding to cognitive impairment (van Harten et al., 2018). The perception of loneliness was higher in the second group (76.62% vs. 73.3%), as well as social isolation (87.66% vs. 71.33%) and SMC (54% vs. 90.2%) demographic characteristics were similar in both groups (Table 2, Figure 1).

Table 3 describes the multivariate regression model adjusted by age, sex, and education. There's a negative and statistically significant association with loneliness (β = -.046; 95% CI = [-.080, -.013]; p = .007) and isolation (β = -.168; 95% CI = [-.089, -.018]; p = .003), while SMC had a positive association with ECog (β = .812; 95% CI = [-.16, -.11]; p = < .001), this model explains the 15% of the variability of the E-Cog score.

Table 3
Association of loneliness, social isolation, and subjective memory complaint with daily cognitive function (Multivariate regression model = E-Cog[a])

	β	*CI 95%*	*p value*
Loneliness	-.046	-.080 – .013	.007
Social isolation	-.168	-.089 – .018	.003
Subjective Memory Complaint	.812	-.16 – 0.11	< .001

Notes: Social isolation detected by EPII: physical distancing and quarantine. Loneliness was determined with 1 or more affirmative items in the De Jong Gierveld Loneliness Scale. Subjective memory complaint was determined with 1 or more affirmative items in the 7-Memory Questionnaire.
[a] Model adjusted for age, sex, and years of education. E-Cog was dependent variable using a suggested cutoff point of 1.31 (average).

DISCUSSION AND CONCLUSION

In this study, with data from a remote survey conducted in older adults living in the community, carried out during the first wave of the COVID-19 pandemic in Mexico, we found a negative and statistically significant association with self-perception of loneliness and social isolation and daily cognitive function, in contrast, SMC was higher in those with worse daily cognitive performance.

The frequency of loneliness in the participants is higher than that reported in the literature, being 84% compared to 30.9% and 43.1% reported by a cohort of older adults in California and Canada, respectively, during the COVID-19 pandemic (Savage et al., 2021). This feeling of loneliness appears to be even greater compared to the increase reported during confinement, for instance, in a cohort study of older adults in primary care in Hong Kong (n = 538, age = 70.6 + 6.1). Loneliness measured by the De Jong Gierveld scale during the COVID-19 pandemic increased from 1.6 to 2.9 positive items on average while the participants in our study had an average of 4.13 (1.1) positive items (Wong et al., 2020). Consistent with previous studies (Zovetti, Rossetti, Perlini, Brambilla, & Bellani, 2021), most of the participants with loneliness were women.

Older adults with the lowest report of loneliness were found in the lowest E-Cog scores, that is, those who referred

loneliness during lockdown had a worse performance in the global E-Cog score. These findings coincide with those reported by Kim, Beam, Greenberg, and Burke (2020) who points out that loneliness predicts worse performance in several cognitive domains such as immediate memory, visuospatial skills, and processing speed (Kim et al., 2020).

In two previous studies, carried out as cohorts from China and Argentina using the E-Cog scale, the additional memory domains, such as language, divided attention, and planning (Marshall et al., 2014) were associated with a lesser impact on functionality compared to FAQ (Functional Assessment Questionary) without showing an association with hippocampal hypometabolism, and the ROI (Regions of Interest) of Alzheimer's disease compared to the memory-related domain (Hsu et al., 2017) which could suggest greater usefulness for the detection of amnestic cognitive profiles compared to other scales.

The mechanism that explains how loneliness impacts on cognitive functions remarks a strong relationship with chronic stress underlying prolonged periods of loneliness, increased glucocorticoid activation and hypercortisolism. These physiological alterations occur differently depending on the loneliness' period length. Thus, transient loneliness can activate the hypothalamic-pituitary-adrenal (HPA) axis to negatively regulate inflammatory responses while persistent loneliness is associated with increased production of pro-inflammatory cytokines such as: tumor necrosis factor-alpha (TNF-α), Interleukin 1-beta (IL-1β), Interleukin 6 (IL-6), among others (COX-2 and iNOS; Akhter-Khan et al., 2021; Bzdok & Dunbar, 2020). This state of chronic inflammation decreases dopamine signaling, circadian rhythm, and monoamine levels (serotonin, norepinephrine, and dopamine) which in turn synaptic plasticity and neuronal survival decrease. Consequently, neurodegeneration increases, perpetuating axis dysfunction HPA and physiological reward mechanisms (Wilkialis et al., 2021). In cohort studies, loneliness was associated with poorer performance in different types of memory, with a faster decline in semantic memory compared to episodic memory (Shankar, Hamer, McMunn, & Steptoe, 2013).

Similar with the English Longitudinal Study of Aging, were social isolation is associated with decreased episodic memory and verbal fluency after a 4-year follow-up period (Shankar et al., 2013) a Spanish study in older adults showed that greater social isolation is associated with lower scores in neuropsychological assessment batteries, reflected in both the global cognitive score and worse performance in verbal fluency and forward digits (Lara et al., 2019). In animal models, these findings have been related to alterations in the CA2 region of the hippocampus, (Leser & Wagner, 2015; Mumtaz et al., 2018) therefore, it is plausible to detect social isolation as an additional risk factor for cognitive impairment. In general, social interaction generates demands that protect and maintain cognition, leaving isolated people vulnerable to impaired cognition (Burns et al., 2020; Kim et al., 2020). Thus, we propose that social isolation in the participants of our study comes from an emergent situation as part of the preventive measures of contagion.

Previous studies with older adults during confinement as a result of COVID-19 in China report that being a woman and living alone carries a greater risk of perceived isolation since they depend more on family members and friends for social support. This was reduced due to social distancing during COVID-19 (Brailean, Steptoe, Batty, Zaninotto, & Llewellyn, 2019). However, this condition of physical distancing does not imply the deprivation of the feeling of accompaniment, protection or closeness to people in the form of an emotional connection as it occurs when experiencing loneliness. That is, the significant effects of loneliness, conceptualized as (self-perceived) social isolation, on general cognitive function can be found together but not always (Burns et al., 2020; Kim et al., 2020).

Regarding SMC, it is known that up to 25 to 50% of older adults living in the community refer it to first-contact doctors, which makes this a common problem. Memory complaint is associated with poorer performance in all the cognitive domains identified with validated instruments, mainly in relation to immediate recall, verbal fluency, and processing speed. These results have been described not only in older adults with increased memory complaints (cognitively intact), but also in those with cognitive impairment (Brailean et al., 2019). We found a higher frequency of SMC than that reported, interestingly, we observed that most of the participants with worse performance in daily cognition had higher SMC, despite having similar sociodemographic characteristics, it stands out that the greatest complaint is found in the items related in memory domain. E-Cog has been proposed as an instrument to assess subjective cognitive decline (SCD): Any occasion SCD = any item scored ≥ 2, but none ≥ 3; any consistent SCD = any item scored ≥ 3. (Rueda et al., 2015) That is, the prognostic value of SCD for incident MCI improves when both consistency of SCD and associated concern are evaluated.(van Harten et al., 2018) Thus, it is important to highlight the role of loneliness and isolation in SMC.

Limitations and strengths

Our study has some limitations, the design of the study, derived from an online survey. We do not have information prior to COVID-19 pandemic lockdown in these older adults, so we cannot know if they had isolation before the starting point of the study. We recognize that the E-Cog results were not compared with informant scores since there are previous studies where people with mild cognitive impairment reported performing better (lower scores) compared to the informants' report (family members, caregivers; Marshall et al., 2014). On the other hand, although E-Cog

has shown good test-retest reliability, even in the Spanish version, where both global and domain-specific scores have shown different trajectories in participants with cognitive impairment, dementia, and cognitive health (Farias et al., 2008; Filshtein et al., 2020; Marshall et al., 2014) so, based on suggested cut-off point derivated from cross-sectional studies (van Harten et al., 2018), this sample had similar characteristics in unimpaired cognition and probably cognitive impaired. Although the history of depression was questioned, we do not have screening tests to rule out the presence of loneliness as a confounding factor for affective disorders (Domènech-Abella et al., 2020; Tragantzopoulou & Giannouli, 2021).

Among the strengths of the study, we were able to describe the health characteristics of a sample of Mexican older adults from the community during the first wave of the SARS-CoV2 pandemic. As far as we know, this is the first study conducted on Mexican older adults with daily cognitive function. Although loneliness and social isolation are usually empirically associated, they should be approached as distinct and independent phenomena.

In our study, we found that OA with loneliness and social isolation have impairment in daily cognitive function which strongly suggests the need to increase vigilance of those identified with these conditions resulting from the deleterious effect on cognition.

The SARS-CoV2 pandemic brought multiple challenges but also valuable lessons for clinicians. Regarding cognition, it was possible to recognize latent but forgotten risk factors: loneliness and social isolation. A frequent condition in older adults prior to the contingency, and that provides greater vulnerability, especially in those who already had cognitive impairment even in preclinical phases like SMC. A better understanding of this phenomenon will allow the development and adaptation of evidence-based interventions to address and prevent its impact on cognitive decline.

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Conflict of interest

The authors declare they have no conflicts of interest.

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The role of parental education on verbal abuse and its impact on the mental health of young adults

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ABSTRACT

Introduction. Verbal abuse is one of the domestic violence that is still underestimated because it has no direct physical effect; it has a tremendous impact on young adults' mental health. **Objective.** This study wanted to confirm the negative effect of verbal abuse on mental health. In addition, parental education is also predicted to play a role in young adults' mental health. **Method.** This study uses a quantitative approach with a total sample of 160 respondents, consisting of 47 males and 113 females. Data collection was carried out by distributing questionnaires through social media, with the criteria of respondents being in the range of 18-22 years old and being cared for by their parents in childhood. **Results.** The results showed a significant negative effect of parental verbal abuse in childhood on mental health in young adults. In addition, a father's education also has a positive effect on young adults' mental health, whereas a mother's education does not play a role in mental health. **Discussion and conclusion.** Verbal abuse from parents as a youngster will impact one's mental health as a young adult. Future research is expected to look at who commits verbal abuse in more detail and increase the sample size to evaluate the effect of maternal education.

Keywords: Verbal abuse, mental health, education, young adult, childhood.

RESUMEN

Introducción. El abuso verbal es una de las violencias domésticas que aún se subestima porque no tiene ningún efecto físico directo; de hecho, tiene un impacto tremendo en la salud mental de los adultos jóvenes. **Objetivo.** Este estudio quería confirmar el efecto negativo del abuso verbal en la salud mental. Además, también se prevé que la educación de los padres desempeñe un papel en la salud mental de los adultos jóvenes. **Método.** Este estudio utiliza un enfoque cuantitativo con una muestra total de 160 encuestados que consta de 47 hombres y 113 mujeres. La recolección de datos se llevó a cabo mediante la distribución de cuestionarios a través de las redes sociales, con el criterio de que los encuestados se encontraran en el rango de 18 a 22 años y fueran cuidados por sus padres en la infancia. **Resultados.** Los resultados mostraron un efecto negativo y significativo del abuso verbal de los padres en la infancia sobre la salud mental en el adulto joven. Además, la educación del padre también tiene un efecto positivo en la salud mental de los adultos jóvenes, mientras que la educación de la madre no influye en la salud mental. **Discusión y conclusión.** El abuso verbal de los padres cuando era joven tendrá un impacto en la salud mental de uno en el adulto joven. Se espera que la investigación futura observe quién comete abuso verbal con más detalle y aumente el tamaño de la muestra para evaluar el efecto de la educación materna.

Palabras clave: Abuso verbal, salud mental, educación, adulto joven, niñez.

INTRODUCTION

Children's growth is influenced by their surroundings and family. Parenting patterns influence how to care for children. During childhood, children tend to have an egoistic attitude, stubbornness, and rebellion against parental rules with the desire to gain freedom and fulfill curiosity. This situation will make parents feel that their children are difficult to manage, then consciously or unconsciously abuse children verbally (Indrayati & PH, 2019).

Verbal abuse is characterized as any language or speech intended to distress an individual that could be considered demeaning, insulting, intimidating, or disrespectful (Howells-Johnson, 2000) and resulting in feelings of low self-esteem and hindering ambitions and goals (Howells-Johnson, 2000). Study Coates, Dinger, Donovan, and Phares (2013) showed differences in the impact of verbal abuse by fathers and mothers on Southeastern University students' psychological distress (mental health). Mother's verbal abuse was a strong predictor of greater psychological distress in adult daughters and sons. On the other hand, the father's verbal abuse did not rise as a significant predictor of adult daughters' or sons' greater psychological distress. A study conducted during the COVID-19 pandemic on 125 children in Jakarta, Indonesia, showed the presence of fathers who were more often at home because they did not have to work in the office were found to have verbally abused their children by cursing, scolding, yelling, and threatening. Children felt that they did not obtain the expected learning guidance. Father abuse is more deemed because it is recognized more often than mother abuse. Furthermore, the verbal abuse received by children will cause psychological trauma in the long term (Fitriana, Sagita, & Utami, 2021).

In terms of violence, most people's views are more inclined toward cases related to physical abuse; otherwise, they are ignored. Verbal abuse is one of the domestic violence that is still underestimated because it has no direct physical effect; it has a tremendous impact on children's mental health. Indrayati and PH (2019) stated that 86.9% of 61 children experienced verbal abuse from their parents. Various types of words that hurt children will affect them, both at the time and in the future. Verbal abuse will hurt the children and make them think they are what their parents say. The other impact of verbal abuse is not felt directly but through a gradual process (Fitriana, Pratiwi, & Sutanto, 2015).

The negative effects of verbal abuse can impact individuals' emotional wellbeing and development (Brendgen, Wanner, & Vitaro, 2006). The effects of verbal abuse on mental health are in class with other types of abuse, such as sexual or physical abuse, which are generally considered more gradual (Jeong et al., 2015). Emotional abuse in the pattern of verbally aggressive parenting has been exposed to lasting effects on brain development (Polcari, Rabi, Bolger, & Teicher, 2014). In general, memory fades over time for children, adolescents, and adults (Hirst et al., 2001). Yet, memories of highly emotional events are often difficult to forget (Yonelinas & Ritchey, 2015).

Children whose parents verbally abuse are more physically aggressive, antisocial, and suffer from interpersonal problems than those who are not (Loh, Calleja, & Restubog, 2011). Other research also shows that children who often receive verbal abuse tend to have serious emotional and behavioral problems, namely aggression, anxiety, depression, lack of emotional attachment, self-confidence, low cognitive abilities, and social relationship problems (Teicher, Samson, Polcari, & McGreenery, 2006). Verbal abuse can have a detrimental effect on the victim's psychological wellbeing and stand for a long time (Wright, Crawford, & Del Castillo, 2009).

Parents who verbally abuse their children will have a psychological impact on children's development. Teicher and Samson (2013) conducted a study that revealed that verbal abuse damages certain connections in the brain, which are part of an individual's strategy to isolate the various types of abuse experienced. A follow-up study by Kim-Spoon et al. (2021) looked at the effects of childhood abuse on brain function; the results showed abuse affects the control system and is related to steeper developmental decreases. The study show abuse is a bad experience for neurodevelopment.

Attachment theory explains how the child-parent relationship rises and affects subsequent development. This theory holds that attachments formed during childhood have important effects later in life, namely in adulthood (Feist & Feist, 1998), and are positioned on the relation between the child and the primary caregivers (mother and father), where the relationship continues throughout the development of an individual's life from infants, toddlers, school years to adolescence, and adulthood (Myers, 1999). When parents or caregivers treat children in an intrusive or abusive way, it will cause pathogenic conditions in children, which will have an impact on adulthood (Ecke, Chope, & Emmelkamp, 2006). In a study, Riggs (2010) proposes a model that previous emotional abuse arouses insecure attachment, which debilitates emotional regulation and contributes to destitute mental health.

Mental health has concepts that involve mental balance and internal emotional, subjective wellbeing, the ability to effectively manage stress, the perception of efficacy, autonomy, the ability to live harmoniously, and intellectual capacity for self-realization (Martínez-Soto, Montero-López Lena, & Córdova y Vázquez, 2014). Common mental health problems affect thoughts, feelings, behavior, and social relationships with others (Granrud, 2019). Among adolescents, mental health problems can appear in various forms, for example, internalization and externalization problems. Internalization problems refer to emotional problems, and externalization problems to behavioral problems (Granrud, 2019).

Previous studies have shown a relationship between the experience of verbal abuse during life with parents as a child to the mental health of young adults (Fitriana et al., 2015; Loh et al., 2011). Socio-economic status also plays a role in the impact of parental verbal abuse on children's mental health (Sabarre, Villareal, & Arcinas, 2021). In addition, differences in parental sex affect the effect of verbal abuse on mental health (Fitriana et al., 2021). Quesnel-Vallée and Taylor (2012) stated the influence of parental education on children's mental health. Meanwhile, Risma, Solfiah, and Satria (2018) showed a relationship between parental education and verbal abuse, where the sample is 300 parents in Pekanbaru, Indonesia. Therefore, this study wanted to look in detail at the role of education of each parent on mental health and verbal abuse. Based on the sample's age ranging from 18-22 years, we will use the term young adults to describe the sample.

The aims of this study were to establish the influence of past parental verbal abuse in childhood on mental health of young adults and to determine the role of parents' education on verbal abuse.

METHOD

Design of the study

Study with cross-sectional research for empirical-analytical using regression analysis. With independent variables consisting of sex, age, education of mother, education of father, the income of parents, and verbal abuse. At the same time, the dependent variable is mental health.

Sample

The population is young adults domiciled in Indonesia. Sample members must meet the inclusion criteria, including Indonesian citizens aged 18-22 years and were cared for by their parents as a child, while the exclusion criteria were refusing to give informed consent. Sampling was carried out in September 2021. Data collection was carried out by distributing online questionnaires through Instagram, Line, Twitter, and WhatsApp. The numb 34 respondents were 160, consisting of 47 men (29.4%) and 113 women (70.6%).

Measurements

Verbal abuse was measured using the Verbal Abuse Questionnaire (VAQ) from Teicher et al. (2006). This measure evaluates types of verbal abuse, including scolding, yelling, swearing, blaming, threatening, demeaning, mocking, insulting, criticizing, shouting, belittling, and demeaning. In this study, trans adaptation was carried out concerning Beaton, Bombardier, Guillemin, and Ferraz (2000).

Adaptation is carried out in the following stages, 1. translating the instrument from the original language into Indonesian by two translators, 2. synthesizing the two translations into one translation, 3. translating the synthesis results back into the original language, and carrying out a different translator for the validity process, 4. the expert committee reviewed the translation of the measuring instrument by considering the equivalence of semantic, idiomatic, experiential, and conceptual 5. the measuring instrument by pretested 38 young adults, they were asked to complete a questionnaire and provide an opinion on understanding. Face validity was used based on an assessment of each item's appearance, format, and context, where respondents were asked to provide an assessment based on a set scale. The results of face validity showed that the instructions in the questionnaire were easy to understand, so it was concluded that the questionnaire had high validity. Construct validity was used based on the correlational method test, and the results showed that the instrument items were valid. The reliability test was carried out using the Cronbach Alpha technique. The results showed that the verbal abuse variable was .954 and the mental health variable was .849. Both scales had high reliability, so it could be concluded that the instrument was reliable. The final result showed no statement items were declared invalid from the instrument.

Mental health was measured using the Mental Health Inventory (MHI-38) as developed by Veit and Ware (1983), which has been adapted into Indonesian by Aziz and Zam-

Table 1
Description of respondents

Age	Year	18	19	20	21	22		
	%	16.3%	22.5%	19.3%	18.1%	23.8%		
Income (I)	IDR (K)	I < 1500	1500 ≤ I < 3000	3000 ≤ I < 5000	5000 ≤ I ≤ 7500	I > 7500		
	%	5.6%	21.3%	43.8%	16.9%	12.4%		
Education	*Level*	*Elementary*	*Junior H School*	*High School*	*Diploma*	*Bachelor*	*Master*	*Doctoral*
	Father	3.7%	4.4%	23.1%	8.1%	41.9%	17.5%	1.3%
			31.0%			68.8%		
	Mother	3.7%	11.9%	19.4%	18.1%	41.9%	4.4%	1.6%
			35.0%			65.0%		

Table 2
Verbal abuse by parents

	Never (%)	*Once or twice (%)*	*Once / year (%)*	*Several times / year (%)*	*Monthly (%)*	*Weekly (%)*	*Several times / week (%)*	*Every day (%)*
Scold	.6	18.1	1.3	19.4	14.4	5.6	33.8	6.9
Yell	16.9	17.5	1.3	16.9	16.9	5.0	23.1	2.5
Blame for things	38.8	12.5	3.1	21.3	11.3	1.9	11.3	.0
Swear	7.5	26.3	1.9	23.8	15.6	5.0	18.1	1.9
Insult	43.1	15.0	5.6	21.3	9.4	.6	5.0	.0
Threaten	73.8	21.9	1.9	.6	.0	.0	.0	.0
Tell stupid	53.8	10.0	3.8	24.4	3.1	.6	3.1	1.3
Call with bad names	29.4	22.5	5.6	23.1	9.4	2.5	6.9	.6
Blame that didn't do	21.9	30.0	6.3	31.9	5.0	.0	5.0	.0
Humiliate	33.1	15.6	6.9	31.3	.0	6.3	6.3	.6
Scream	.6	20.0	1.3	37.5	20.6	2.5	14.4	3.1
Criticize	48.8	17.5	10.6	17.5	3.1	.0	2.5	.0
Tell incapable	53.8	18.8	10.6	11.3	2.5	.0	3.1	.0
Make feel worthless	35.0	17.5	3.1	30.0	6.9	1.3	6.3	.0
Raise the voice	8.1	22.5	1.9	12.5	12.5	6.9	29.4	6.3

roni (2019). The aspects revealed in this measuring instrument are psychological wellbeing (positive emotions, love, life satisfaction) and psychological distress (anxiety, depression, loss of control).

Procedure

Participants are young social media users aged 18-22 years. They were asked to voluntarily fill out questionnaires distributed through Bio Instagram, Line Group, WhatsApp Group, and Timeline Twitter. The questionnaire was made in the structure of a Google Form. It stated the purpose of filling out the questionnaire and including a contact person who can be contacted. Those who can fill out the questionnaire have experienced verbal abuse from their parents as a child. Those willing to fill out the questionnaire also express their agreement to participate and submit the completed questionnaire anonymously. Furthermore, the data obtained were processed and analyzed using SPSS 24 software.

Statistical analysis

A two-way ANOVA was used for a Groupwise comparison test with F-test. This test evaluates whether there is a difference in the group mean of any education group of verbal abuse variable. Furthermore, Multiple Regression analysis, with the "enter" method, was used to explain the influence of the independent variable (sex, age, education of mother, education of father, income of parents, verbal abuse) on the dependent variable (mental health).

Table 3
Mental Health of Young Adults

	Strongly Disagree				*Strongly Agree*
	0 (%)	*1 (%)*	*2 (%)*	*3 (%)*	*4 (%)*
Daily life is interesting	6.3	28.7	30.6	26.3	8.1
Enjoy what you do	.6	16.9	15.0	51.9	15.6
Feel comfortable communicating	1.3	2.5	22.5	51.9	21.9
Feel valuable	2.5	13.1	32.5	36.3	15.6
Feeling happy	1.9	15.6	38.8	30.6	13.1
Enjoy the life	1.3	9.4	20.0	53.1	16.3
Feel confused or frustrated	3.1	17.5	25.0	46.3	8.1
Feel tired or helpless	6.3	29.4	17.5	40.0	6.9
Feeling at rock bottom	6.9	21.3	21.3	39.4	11.3
Enjoy the feeling of despair	1.3	9.4	15.0	54.4	20.0
Feel out of control	2.5	11.3	13.1	56.9	16.3
Feel have nothing	3.1	10.0	18.1	43.8	25.0

Table 4
Paired Sample Test – Paired Differences

	Mean	Std. deviation	Std. error	95% CI of the difference Lower	Upper	t	df	Sig. (2-tailed)
Father's and mother's education	.106	.443	.035	.037	.175	3.034	159	.003

Variable: Father's education and mother's.

The linear regression model is used to describe the effect of the independent variable on the dependent variable.

$$Y = a + b\,X1 + c\,X2 + d\,X3 + e\,X4 + f\,X5 + g\,X6$$

Where X1 = sex, X2 = age, X3 = education of mother, X4 = education of father, X5 = income of parents, X6 = verbal abuse, and Y = mental health. Meanwhile, b, c, d, e, f, g are the regression coefficients, and a is the intercept constant.

Ethical considerations

The ethics committee of Universitas Brawijaya, Indonesia, approved the project and procedures of this research (1715/UN10.F11.15/PP/2021). The respondents have the opportunity to study the questionnaire and participate accordingly with ethical research considerations.

RESULTS

Data characteristics from respondents that describe their age, education of father and mother, and parental income per month are displayed in Table 1.

Based on Table 1, respondents aged 22 years old had the largest percentage, namely 23.8% or 38 respondents. The age of respondents has a mean of 20.05 years old (SD = 1.43). The education of fathers was mostly bachelor's (41.9%), and those who had education above high school were 68.8%. Meanwhile, the education of mothers in the bachelor category also had the highest percentage, namely 41.9%, and those who had education above high school were 65%. The majority of respondents' parents had a monthly income of IDR 3,000,000 ≤ I < 5,000,000 with a total percentage of 43.8% and income have a mean of IDR 4,152,000 (SD = 1,994,000). IDR is the Indonesian currency.

Verbal abuse had a mean of 32.67 (SD = 21.137) with a minimum value of 2 and a maximum of 81. Based on Table 2, the most significant types of verbal abuse that young adults never received during their childhood were said to be stupid (53.8%) and incapable (53.8%). On the other hand, the largest portion of the verbal abuse received every day is being scolded (6.9%) and having a high tone of voice (6.3%).

Mental health had a mean of 30.48 (SD = 7.237) with a minimum of 12 and a maximum of 48. As seen in Table 3, the psychological wellbeing condition of young adults with the largest percentage is feeling comfortable communicating with friends (21.9%) and being able to enjoy life (16.3%); however, the psychological condition where daily life is interesting is not owned by young adults with the largest percentage (6.3%) than others. On the other hand, the psychological distress condition with the largest percentage of young adults has nothing to look at the future (25%) and enjoy hopelessness (20%).

Table 4 displayed that there are group differences between the father's education and mother's education with a significance of .003 ($p < .05$). The following analysis looks at whether each father's education and mother's education have a role in verbal abuse.

Table 5 shows that the father's education affected verbal abuse differentiation by a significance of .029 ($p < .05$). Meanwhile, the mother's education and the interaction between the father's and mother's education do not affect verbal abuse.

Table 5
Tests of between-subjects effects

Source	df	Mean square	F	Sig.
Corrected model	21	1,150,780	3.388	.000
Intercept	1	29,955,481	88.196	.000
Education of father*	6	826,807	2.434	.029
Education of mother	6	342,507	1.008	.422
Education of father x Education of mother	9	324,047	.954	.481
Error	138	339,645		
Total	160			
Corrected total	159			

Dependent variable: verbal abuse.
N = 160; *$p < .05$; R squared = .340.

Table 6
Coefficients of linear regression

Model	*B*	*Std. error*	*Beta*	*t*	*Sig.*
Constant	26.209**	8.427		3.110	.002
Sex	.486	1.172	.031	.414	.679
Age	.276	.369	.055	.749	.455
Education of mother	-.185	.490	-.033	-.378	.706
Education of father	2.250*	1.340	.145	1.679	.095
Income	.143	.522	.021	.274	.784
Verbal abuse	-.177**	.028	-.517	-6.227	.000

Dependent variable: mental health.
N = 160; ***p* < .05; **p* < .10; R Square = .241.

A regression model was used to predict the effect of sex, age, education of fathers, education of mothers, the income of parents, and verbal abuse by parents on the mental health of young adults. Table 6 displays that a father's education affects mental health by a significant .145(< .10), and verbal abuse significantly affects mental health by -.517(< .05). Sex, age, mother's education, and parent's income did not affect mental health. A significant regression was found between such variables; every 26.209 points scored in the Verbal Abuse Questionnaire (VAQ) predicted a decrease of -.177 points in the Mental Health Inventory (MHI-38).

DISCUSSION AND CONCLUSION

Respondents of this study were 160 young adults aged 18-22 years old, and they were cared for by their parents during childhood. The results showed that the sex and age of young adults and parental income did not play a role in young adults' mental health.

Young adults in this study have an age a mean of 20.05 years old, consisting of 29.4% males and 70.6% females out of 160. Parents' monthly income has an average of IDR 4,152,000 (SD = 1,994,000). The average income range in the study is equivalent to the average income in Indonesia, which is IDR 5,183,000 (Badan Pusat Statistik [BPS], 2021). While the education of the parents who have a level above high school for father education reaches 68.8% and mother education reaches 65%.

The regression analysis results showed that verbal abuse and father education affect young adults' mental health. The effect of verbal abuse was -.517, which means that the more verbal abuse received by young adults during childhood, the more likely they are to have lower levels of mental health.

The results of this study confirm previous studies. Yun, Shim, and Jeong (2019) stated that verbal abuse that conveys wrongdoing unfairly would harm mental health. A similar study states that verbal abuse received in childhood will lead to psychological disorders in adulthood (Thomason, 2018). The emotional experience of verbal abuse will instill self-destructive beliefs such as the thought of being stupid and unworthy of attention (Rogosch, Cicchetti, & Aber, 1995; Waldinger, Toth, & Gerber, 2001).

Father's education had an effect of .145 on young adults' mental health. The magnitude of the influence of a father's education on mental health is more diminutive than verbal violence. The positive effect indicates that a better father's education level tends to have a better mental health impact on young adults. On the other hand, the lower the education of the father, the more likely he will be to have young adults with common mental health. Meanwhile, mother education does not affect young adults' mental health. It is also known that father education affects verbal abuse. Furthermore, it can be explained that a father's education is an antecedent of the influence of verbal abuse on the mental health of young adults; in short, there is a role of a father's verbal abuse on mental health.

Indonesian culture places the father as the head of the family, responsible for the needs of family members, including children. The role of the mother is to take care of children while working for an income is not an obligation. The father will be a role model for the child. The relationship between the child and the father tends to be more formal than the relationship with the mother. Indonesian society still holds a strongly patriarchal culture, where there is a dominant role of the father in the family. Dagun (2013) explained that the father's role in parenting is necessary for a child's development because the mother's role is different from the father's. The psychological development of children can be influenced by a fatherless condition, where the absence of a father's role in the child's life results in low psychological well-being (Sundari & Herdajani, 2013).

The study results indicate that the negative effect of verbal abuse on young adults' mental health confirms previous research. Verbal abuse from parents received in childhood will affect mental health as a young adult. This study found an interesting finding that only the father's level of education affects young adults' mental health, not the mother's level of education. The result showed differences in the educational background between father and mother and the impact of father education on verbal abuse. Meanwhile, the different educational experiences of mothers did not produce significant differences in verbal abuse. The average level of education in Indonesia, among 100 people over the age of 15 years, 29% have completed high school, and 9.67% have completed a bachelor's degree (BPS, 2021). With an education level above high school of more than 60%, it shows that the education level of the sample used is already above the average level in Indonesia. In addition, gender, age, and family economic level (parental income) do not play a role in young adults' mental health.

The limitation of this study is that it was not specifically identified whether the mother, father, or both were involved in verbal abuse among the parents involved in this study. Future studies are expected to see in detail who

commits verbal abuse and expand the scope of research to confirm the role of maternal education.

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Conflict of interest

The authors declare no conflicts of interest.

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Mindfulness-Based Cognitive Therapy (MBCT) and Mindfulness-Based Stress Reduction (MBSR) in the treatment of Post-Traumatic Stress Disorder (PTSD): A literature review

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ABSTRACT

Background. Previous reviews have concluded that whilst mindfulness-based interventions reduce PTSD symptoms through fear extinction and cognitive restructuring, further research is needed. **Objective.** The aim of this report is to systematically review existing literature about the association between standardized mindfulness-based interventions and PTSD with the aim of identifying implications for practice and recommendations for future research. **Method.** The CINAHL Complete, PsycINFO, Medline, and PsycArticles databases were searched, looking for full-text articles from 2018 up to march 2022. **Results.** There was a significant improvement in PTSD symptoms in MBCT participants, even if some experienced a high increase at baseline. MBSR participants with moderate to severe trauma symptoms showed a greater reduction in symptoms whereas mild trauma symptoms at baseline showed slightly higher symptomatology at the end of treatment. **Discussion and conclusion.** From the results, MBCT, MBSR, and their variations seem to tackle different domains of the diagnosis. Whilst MBSR is associated with improvements in terms of attentional difficulties, MBCT facilitates the connection between dysfunctional cognitive concepts and avoidant behaviours that maintain the symptomatology. Nevertheless, the active components of MBCT or MBSR that have an impact on symptom reduction are undetermined. Future studies will be enhanced by monitoring the change in underlying mechanisms attached to the practice of mindfulness through outcome measurements, among other considerations.

Keywords: MBCT, MBSR, mindfulness, PTSD.

RESUMEN

Antecedentes. Las revisiones anteriores han concluido que las intervenciones basadas en la atención plena reducen los síntomas del TEPT a través de la extinción del miedo y la reestructuración cognitiva, aunque se requiere mayor evidencia. **Objetivo.** Revisar sistemáticamente la literatura existente sobre la asociación entre las intervenciones estandarizadas basadas en mindfulness y el TEPT con el objetivo de identificar implicaciones para la práctica y recomendaciones para futuras investigaciones. **Método.** Se realizaron búsquedas en las bases de datos CINAHL Complete, PsycINFO, Medline y PsycArticles de textos completos desde 2018 hasta marzo de 2022. **Resultados.** Hubo una mejora significativa en los síntomas de TEPT en los participantes de MBCT, incluso si algunos experimentaron un gran aumento al inicio. Los participantes de MBSR con síntomas de trauma moderado a severo mostraron una mayor reducción de los síntomas, mientras que los síntomas de trauma leve al inicio mostraron una sintomatología ligeramente más alta al final del tratamiento. **Discusión y conclusión.** A partir de los resultados, MBCT, MBSR y sus variaciones parecen abordar diferentes dominios del diagnóstico. Mientras que MBSR se asocia con mejoras en términos de dificultades atencionales, MBCT facilita la conexión entre conceptos cognitivos disfuncionales y conductas de evitación que mantienen la sintomatología. Sin embargo, los componentes activos de MBCT o MBSR que tienen un impacto en la reducción de los síntomas son indeterminados. Los estudios futuros se mejorarán al monitorear el cambio en los mecanismos subyacentes asociados a la práctica de la atención plena a través de mediciones de resultados, entre otras consideraciones.

Palabras clave: MBCT, MBSR, atención plena, TEPT.

BACKGROUND

According to the fifth version of the Diagnostic Statistical Manual (DSM-V) of Mental Health, Post-Traumatic Stress Disorder (PTSD) is defined by symptoms related to five dimensions: Re-experiencing distressing events, hyperarousal (irritability, recklessness, hypervigilance, exaggerated startle response, concentration difficulties, and sleep disturbance), persistent avoidance, negative cognitions, and mood alterations, although complex symptoms include dissociation (American Psychiatric Association [APA], 2013). Dissociative symptoms can be manifested through depersonalization or feeling detached from one's mental processes and derealization or experiencing unreality of surroundings (APA, 2013). All symptoms must be present after one month of experiencing an actual or threatened death, whether direct, witnessed, or learned (APA, 2013).

The National Institute for Health and Care Excellence (NICE, 2016a) suggests that suitable psychological treatment interventions in cases of PTSD are Trauma-focused Cognitive Behavioural Therapy (TF-CBT) and Eye Movement Desensitisation and Reprocessing (EMDR) in children and young people (CYP). In adults, the NICE (2016a) guidelines recommend Cognitive Processing Therapy, Cognitive Therapy (CT) for PTSD, narrative exposure therapy, prolonged exposure therapy, EMDR, and computerized TF-CBT if no severe symptoms or risk of harm are present. Interventions in adults and CYP are based on standardized manuals that aim to restructure the traumatic meaning and overcome avoidance, where follow-ups on dates significant to the event are considered (NICE, 2016a). In terms of differences, the NICE (2016a) guidelines emphasize that CYP interventions need to be adapted to developmental age and involve their respective caregivers whilst in adults the focus is on re-establishing adaptive functioning. Overall, the interventions recommended across the life span are individual in nature, and CT or Cognitive Behavioural Therapy (CBT) is referred to as evidence-based treatment.

As developed by Beck (1976/1989), CBT is an evidence-based model of psychological therapy built on the assumption that cognitions, emotions, behaviors, and physical sensations are interlinked in the creation of a vicious cycle that perpetuates the main problem. Because each of these four factors influences each other, if one of them were to be intervened, the others would most likely change in their presentation (Wills & Sanders, 2013). Whilst CBT aims to intervene in thoughts and behaviors, CT focuses purely on the cognitions involved under the premise that the event's interpretation generates an emotion instead of the event by itself causing a particular emotion (Kennerley, Kirk, & Westbrook, 2007).

Regarding mindfulness, the NICE (2016b) guidelines maintain that Mindfulness-Based Cognitive Therapy (MBCT) is an evidence-based (EB) intervention that prevents relapse in depression or residual symptoms of depression, where low mood, anhedonia, and reduced energy levels are core symptoms. Thus, common domains affected between depression and PTSD are negative cognitions and mood alterations. Mindfulness, a Buddhist cultural tradition of meditation, has been broadly described as the ability to be purposefully attentive in the present moment, thus MBCT promotes self-awareness to generate a cognitive shift when negative mood alterations are experienced since they are not indicative of the present moment (Segal, Williams, & Teasdale, 2013). MBCT is inspired by the initial adaptation of mindfulness into a structured program for Western medical settings aiming to treat chronic pain, named Mindfulness-Based Stress Reduction (MBSR), an eight-week group intervention focused on promoting awareness of thoughts and physiological responses through meditation, breathing exercises, and yoga (Kabat-Zinn, 1994). Although the NICE (2016c) guidelines do not recommend MBSR for the treatment of mental health conditions, it is acknowledged that significant improvements have been found in the treatment of social anxiety disorder (Norton, Abbott, Norberg, & Hunt, 2015).

The rationale of this review

Acknowledging the role of MBCT or MBSR in the treatment of PTSD can inform clinicians' practice and prevent iatrogenic effects on clients. The NICE (2016a) guidelines recommend standardized interventions applied by trained practitioners with ongoing supervision in cases of PTSD. Therefore, mindfulness-based interventions have only recently been considered a treatment of choice since a valid manual for MBSR and MBCT was not available until 1990 (Kabat-Zinn, 1994) and 2002 (Segal, Williams, & Teasdale, 2013) respectively. Since one teacher can conduct these group interventions remotely, their implementation might have a positive impact whilst coping with the COVID-19 pandemic through public health measures, such as isolation (World Health Organization, 2020). Thus, the current review will provide evidence of affordable interventions, which in addition to minimising treatment waiting time for mental health services, create the potential to prevent relapse in clients after completion of treatment (NICE, 2016b).

Previous reviews

Because MBSR and MBCT are treatments based on a valid manual, previous reviews have focused their attention on these two types of mindfulness-based interventions solely. Authors concluded that whilst MBSR reduces PTSD symptoms through fear extinction (Kummar, 2018), MBCT restructures traumatic memories, although further research is

needed by adding neuroimaging techniques, non-veteran populations, and comparing its effects to other therapeutic interventions (Williston, Grossman, Mori, & Niles, 2021). Nevertheless, new articles have been published since the above previous reviews. Therefore, additional information must be addressed in terms of filling the current gaps in the literature.

Objectives

The present review of scientific journals aims to systematically review and update existing literature about the association between PTSD and MBCT or MBSR. The objectives have been listed as follows.

1. To review existing literature about the association between standardized mindfulness-based interventions and PTSD. Particularly, the current study aimed to provide a critical appraisal of the published literature in terms of research methodology.
2. To identify implications for practice and recommendations for future research. Particularly, the current study aimed to provide a critical appraisal of the published literature in terms of populations, outcome measurements, and intervention formats that have been examined.

METHOD

Databases and search

The CINAHL Complete, PsycINFO, Medline, and PsycArticles databases were searched to select studies for inclusion in this review. Search keywords used were MBCT or Mindfulness-Based Cognitive Therapy OR Mindfulness-Based Stress Reduction or MBSR AND Post-Traumatic Stress Disorder or PTSD, looking for full-text articles from 2018 up to march 2022. Details of the databases and search strategy are provided in Table 1.

Inclusion criteria

Publications were included independent of the population's age, gender, intervention format, and the methodology used.

Articles involving active military service members or war veterans were included due to the representativeness of the sample.

Exclusion criteria

Publications referring to trauma or posttraumatic stress (PTS) instead of referring to PTSD were excluded.

Articles not referring to MBCT or MBSR were excluded.

Table 1
Map Term to Subject Heading Search

*Databases**	*Searches*	*Results*
#1	MBCT or Mindfulness Based Cognitive Therapy	5732
#2	MSR or Mindfulness-Based Stress Reduction	4061
#3	PTSD or Post-Traumatic Stress Disorder or Posttraumatic Stress Disorder or Post traumatic Stress Disorder	147876
#4	1 OR 2 AND 3	4234
#5	Limit #3 to the full-text articles	1073
#6	Limit #4 to publication date from 2018 to 2022	396
#7	Limit #5 to academic journals (source type)	390
#8	Limit #6 to the English language	381
#9	Limit #7 to Mindfulness (major heading)	209

* APA PsycINFO, Medline, and APA PsycArticles.

Data extraction and screening process

209 articles were identified through the search and filter of electronic databases, where a two-step screening process was applied. 204 were excluded based on the title. Of the remaining five articles, two were excluded following a review of the abstract and full article against the exclusion criteria as detailed above. Consequently, previous reviews were examined to fill in the gaps of already published work and for any studies that were missed in the database searches. Therefore, a total of four papers were selected for the purposes of this literature review. Figure 1 shows a flow chart of the study selection process.

RESULTS

Quality assessment

After full-text evaluation, the risk of bias was assessed using the assessment method MMAT (Hong et al., 2018). Key quality criteria under evaluation for the quantitative randomized controlled trials (RCT) were appropriate balance and allocation to intervention or control group, completion of outcome data, blinded outcome assessment, and dropout rate. For the other three quantitative non-randomized controlled trials, sample representativeness, completion of outcome data, confounders accountability, and adherence to the planned intervention were considered. The studies were then classified as low if up to a maximum of one criterion had not been accomplished, or high for risk of biases. For a detailed overview of the quality assessment (Table 2), which provides a summary of its fundamental characteristics.

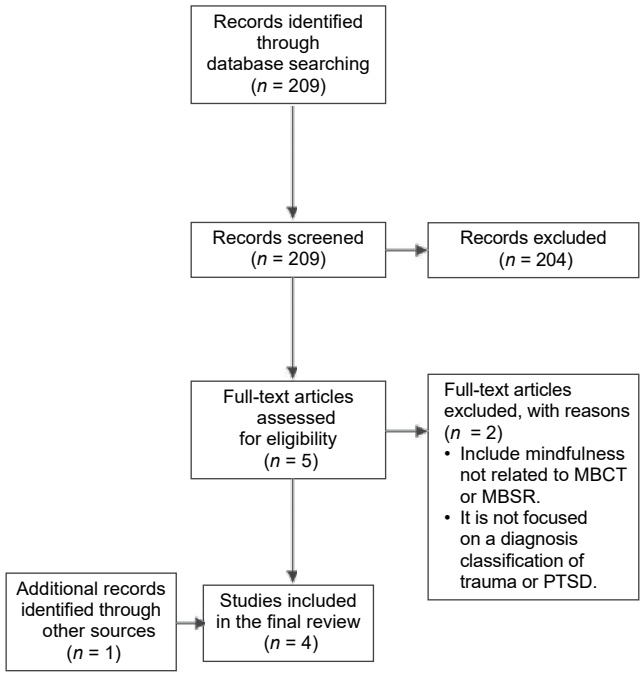

Figure 1. Flow chart of the study selection process (adapted from Moher, Liberati, Tetzlaff, Altman, & The Prisma Group, 2009).

In what populations has the effectiveness of MBCT and MBSR been tested?

Three of these studies were conducted on adults with exception of Fortuna, Porche, and Padilla (2018), where the participants were adolescents. The population presenting PTSD were military active service members, war veterans, adolescents, and black women. Respectively, the rationale to include these populations is that current, or past involvement in acts of war is considered a life-threatening event. Adolescents were included in Fortuna et al. (2018) research because they had experienced a variety of traumatic events one or more times, such as assault, physical or psychological abuse, loss, or serious injury in an accident. Black women were recruited on the basis that female gender due to genetic vulnerability, ethnic minority background, and socioeconomic disadvantage are risk factors for traumatic experiences (Waldron & Burnett-Zeigler, 2022). The participants had survived one to nine different types of traumas, where physical and sexual abuse were the most common.

What formats of MBCT and MBSR have been offered?

Although the format of the intervention varied alongside the four items of research, all of them included face-to-face sessions, an 8-week intervention, and did not have a follow-up after the end of the treatment. Exceptions were Fortuna et al. (2018), which aimed for a 12-week intervention, and Rice, Liu, and Schroeder (2018), which included virtual sessions. The format of each research is described in the following lines.

Jasbi et al. (2018) delivered MBCT in a group format of 8-week, where each weekly session lasted between 60 to 70 minutes and the group size varied from 7 to 12 participants. The content of the MBCT sessions is detailed in Table 3.

Fortuna et al. (2018) used a TF-CBT adaptation for adolescents known as MBCT Dual, combining MBCT with relaxation and breathing retraining (Rosenberg, Jankowski, Fortuna, Rosenberg, & Mueser, 2011). The intervention is conducted in a group format intended to last for 12 weeks although the study only had a 6-week retention. Weekly therapy sessions were 50 to 60 minutes in length. It is worth mentioning that the intervention was delivered in Spanish to 11 of the participants, who were primarily Spanish monolinguals. An overview of MBCT-Dual therapy sessions is provided in Table 4.

Rice et al. (2018) considered weekly in-person (IP) and virtual world (VW) MBSR in different groups of eight weeks each, where VW training involved avatar-to-avatar interaction. The IP group met between two and 2½ hours with an "all-day" silent class of 3½ hours whilst the VW group met for 1½ hours per week with a silent class under the same conditions as the IP group.

Waldron & Burnett-Zeigler (2022) carried out an mind-body intervention adapted from MBSR that focuses on cultivating non-judgmental awareness of the body, maintaining the length of the intervention and content of the sessions (meditation, yoga, body scan, and social interaction). However, the length of the sessions was 90 instead of 180 minutes, which were conducted by a trained health educator, and the program materials related to black artists to reflect the participants' experiences.

What outcome measurements have been used to monitor PTSD symptoms and mindfulness?

With regards to PTSD outcome measures, all studies used the post-traumatic checklist for DSM-5 (PCL-5) or its variations, although the methodology varied with regards to the application of this measurement, with only two applying the questionnaire at the assessment and post-treatment stage (Rice et al., 2018; Waldron & Burnett-Zeigler, 2022). The PCL-5 consists of a 20-item self-assessment questionnaire of symptoms related to the five dimensions identified in PTSD, where answers are given on five-point Likert scales ranging from 0 (not at all) to 4 (extremely; Blevins, Weathers, Davis, Witte, & Domino, 2015). Expanding on its variations, Fortuna et al. (2018) applied the PTSD Checklist-Civilian version (PCL-C), a 17-item version of the PCL recommended for civilian populations where multiple traumas are present (Blanchard, Jones-Alexander, Buck-

Table 2
Fundamental characteristics

Authors	*Sample (Age)*	*Outcome measurements*	*MBCT or MBSR*	*Main findings*	*Design & MMAT Classification*
Jasbi et al. (2018), Iran	48 males (50-55 years)	At assessment: - PTSD Scale for DSM-5 (CAPS-5). - Life events checklist for DSM-5. During the intervention: - Post-traumatic checklist for DSM-5 (PCL-5).	MBCT	PTSD levels experienced a high increase at baseline and decreased significantly at study completion. Both the participants from the control and MBCT groups were prescribed SSRIs at the assessment stage.	RCT & Low risk of bias with no blinded outcome assessment.
Fortuna et al. (2018), USA	37 females and males with 62% of retention (13-21 years)	At screening: - PTSD Checklist-Civilian version (PCL-C). - Upsetting events survey, is a modified version of the Traumatic Life Events Questionnaire (TLEQ). At assessment: - Child PTSD Symptom Scale (CPSS). - Post-Traumatic Cognitions Inventory (PTCI). During the intervention: - Post-Traumatic Cognitions Inventory (PTCI).	MBCT-Dual adapted from MBCT - English version. - Spanish version.	Significant improvement in PTSD symptoms from baseline until the end of treatment, which was associated with changes in trauma-associated cognitions.	Non-RCT & Low risk of bias with confounders.
Rice et al. (2018), USA	133 males and females (Average age 50.45 ± 11.09)	At assessment and post-treatment: - PTSD Checklist-Military version (PCL-M).	MBSR - In-person (IP). - Virtual world (VW).	Clinically although not statistically relevant reductions in PTSD symptoms, particularly for IP group in comparison to VW.	Non-RCT & High risk of bias due to sampling, incomplete outcome data, and confounders.
Waldron & Burnett-Zeigler (2022), USA	36 females (Mean 52.23)	At assessment and post-treatment: - PCL-5. - Five Facet Mindfulness Questionnaire (FFMQ).	Mini-body adapted from MBSR. - Culturally modified to black ethnic minorities.	Reduction of PTSD symptoms in moderate to severe cases. Participants with mild trauma symptoms at baseline showed slightly higher symptomatology at the end of treatment.	Non-RCT & Low risk of bias.

Table 3
MBCT Sessions' Content (Jasbi et al., 2018)

Week	*Sessions*	*Content of sessions*
1	Automatically redirecting	Forming groups, introducing members, determining the rules and boundaries of groups, physical checking exercises, eating raisins, and providing handouts, and homework.
2	Dealing with obstacles	Breathing exercises, focusing on thoughts and feelings, reviewing exercises, and homework.
3	Mindfulness of breathing	Awareness of body, seeing, and hearing. Review exercises and homework.
4	Staying in the present	Doing exercises, defining the stress areas, reviewing exercises, and homework.
5	Acceptance of presence	Contemplation in sitting state with awareness of breathing and body, 3 minutes breathing.
6	Thoughts are not facts	Contemplation in a sitting state with awareness of body, feelings, sounds, and thoughts. Preparing for termination, reviewing exercises, and homework.
7	Taking care of oneself in the best form	Contemplation in a sitting state with awareness of breathing and body. Observation of the relationship between activity, mood, and feelings training. List of boring and enjoyable daily activities, review exercises, and homework.
8	Applying what was learned from the positive mood conditions in the future	Discussion of the exercises conducted during the course, the reasons for continuing these exercises, conducting a survey of the course, review exercises, and homework. Finishing the course along with the last contemplation.

Table 4
Overview of MBCT-Dual therapy sessions (Fortuna et al., 2018)

Sessions (week)	*Content of sessions*
1	Introduction, engagement, and safety plan.
2	Introduction to mindfulness practice.
3	Psychoeducation about PTSD, trauma cognitions, and unhelpful thinking.
4	Psychoeducation about risk behaviors, drug, and alcohol triggers.
5	Managing triggers, cravings, and urges.
6	Common styles of thinking.
7	Observing our thoughts and cognitive restructuring.
8 - 11	Mindfulness-based recovery.
12	Ending therapy and relapse prevention.

ley, & Forneris, 1996). Rice et al. (2018) used the PTSD Checklist-Military version (PCL-M), a 17-item self-report focused on stressful military experiences (Blanchard et al., 1996).

In relation to mindfulness, only one of the studies aimed to monitor changes in awareness. Waldron and Burnett-Zeigler (2022) utilized the Five Facet Mindfulness Questionnaire (FFMQ), which is a 39-item self-report questionnaire of 5 domains identified in mindfulness: Describing, acting with awareness, non-judging, non-reacting, and observing (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006).

What are the results of MBCT and MBSR interventions in the treatment of PTSD?

Regarding MBCT, Jasbi et al. (2018) found that PTSD levels experienced a high increase at baseline in the intervention group and then decreased significantly over time in comparison to the control group. Similarly, in Fortuna et al. (2018) research, there was a significant improvement in PTSD symptoms from baseline until the end of treatment, which was associated with changes in trauma-associated cognitions. There was also a significant reduction in the frequency of substance misuse.

Concerning MBSR, Rice et al. (2018) found that IP and VW are both effective in the reduction of PTSD symptoms in comparison to the control group, although the IP group showed a greater reduction in PTSD symptoms. Along the same lines, the results of Waldron and Burnett-Zeigler (2022) suggest a significant reduction of PTSD symptoms from baseline to end of treatment and an increase in Mindfulness measured by the FFMQ. Nevertheless, a minority of participants that exhibited mild trauma symptoms at baseline, showed slightly higher symptomatology at the end of treatment. The researchers assumed that these women may have been retraumatized by becoming more aware of their thoughts, emotions, and physical sensations without an intervention aiming to change their experience. Conversely, the results also found a correlation between session attendance and PTSD symptom remission, where women with a higher PTSD symptomatology attended more mindfulness sessions. Finally, there were no statistically significant differences in the results between different trauma types.

DISCUSSION AND CONCLUSION

Critical appraisal of the association between MBCT or MBSR and PTSD

Overall, the four pieces of research do not provide extensive details to determine the active components of MBCT or MBSR which have an impact on symptoms reduction. The change in PTSD symptoms in terms of questionnaire items or thinking processes is not reported in the results. Furthermore, the change in underlying mechanisms attached to the practice of mindfulness is only monitored in one of the articles through the FFMQ.

In terms of research methodology, none of the papers included a follow-up to monitor if the improvement in PTSD symptomatology had been maintained over time. Only two of the four studies had a control group with only Jasbi et al. (2018) being an RCT with a low risk of biases. Whilst in Jasbi et al. (2018), the control group was offered socio-therapeutic events (short trips or medical checks), Rice et al. (2018) maintained the control group on a waiting list and invited the participants to MBSR groups after the trial had ended. Hence, the latter does not control for non-therapeutic factors, such as social support and the effect of receiving professional help.

Subsequently, the MMAT classification (Hong et al., 2018) suggests that the research by Rice et al. (2018) presents a high risk of biases due to the presence of confounders and in terms of sample representativeness. In comparison to other studies, a clear description of the participants is not included, where military service populations were invited after completing the PCL-M without specifying if PTSD criteria had been met or if their initial symptoms were over the threshold. Furthermore, nine of the PCL-M results were not included due to computer error, which accounts for incomplete outcome data.

Focusing on the acknowledgment of confounders among the four articles, only two addressed comorbidities among the samples presenting significant PTSD symptoms. Particularly, attentional deficit and hyperactivity (ADHD) in Rice et al. (2018) and Fortuna et al. (2018), where the adolescent population also presented substance misuse. Because the DSM-V (2013) characterized ADHD as difficulties with inattention among other criteria, Rice et al. (2018) did not control for ADHD on the basis that similar symptoms can be caused by PTSD's hyperarousal. Similarly, Fortuna

et al. (2018) attributed substance misuse to the PTSD diagnosis with cannabis, alcohol, or methamphetamines offering a short-term relief for survivors. Consequently, medication as an additional intervention is found in Jasbi et al. (2018) and Fortuna et al. (2018). The first considered MBCT as an adjuvant to Selective serotonin reuptake inhibitors (SSRIs) and the second included adolescents under the prescription of SSRIs, bupropion, or methylphenidate if the participants were on a stable dose for the previous 8 weeks. After mentioning that methylphenidate had been prescribed to a percentage of the adolescents, Fortuna et al. (2018) mentioned that some of the participants were diagnosed with ADHD, which is not previously recognized in the sample description nor controlled for.

With regards to the intervention's format, three of the studies aimed to improve retention rates by providing MBSR adaptations. Firstly, Rice et al. (2018) delivered a virtual format of MBSR, where the participants could remain anonymous. Secondly, Waldron and Burnett-Zeigler (2022) provided a culturally adapted MBSR hosted in a community setting by a representative member of the sample. Thirdly, Fortuna et al. (2018) provided the opportunity to work with matched Spanish-speaking providers. Even though these interventions promoted adherence to the treatment, limitations are also recognized. The former, due to its virtual nature where the participants interacted through an avatar with other members of the group, made it impossible to control for participant's involvement. On a different turn, Waldron and Burnett-Zeigler's (2022) results have implications in terms of replication, considering that mini-body sessions' content is not outlined, nor is the training conducted by the facilitator. A similar gap in terms of the facilitator's expertise is found in Jasbi et al. (2018), with CBT therapists and MBSR instructors carrying out a different modality of mindfulness, MBCT.

Despite the previous points for improvement, the uniqueness of the research papers is one of its strengths since these appear to be the first attempts to investigate whether a standardized mindfulness-based intervention is a suitable intervention for PTSD clients presenting different types of severity. Therefore, the articles could be considered a first step toward informing further research on the topic. From the results, MBCT and MBSR seem to tackle different domains of the diagnosis, whereas Rice et al. (2018) emphasize the improvement in terms of attentional difficulties with whether IP or VW MBSR, which corresponds to the PTSD domain of hyperarousal. Meanwhile, Jasbi et al. (2018) mentioned that by the fourth and fifth sessions, participants were listing their dysfunctional cognitive concepts and linking them to the avoidant behaviors maintaining their symptomatology. Comparing both interventions, the studies suggest that an increase in symptomatology is expected when clients are due to commence the treatment. An eventual decrease in PTSD symptoms is expected for MBCT participants with mild, moderate, and severe presentations whilst MBSR was proven effective only for the latter two.

Implications for practice

MBCT, MBSR, and its adaptations have been safely tested with active military service members, war veterans, ethnic minorities, and adolescents who have been affected by different types of traumas. MBCT-Dual and mini-body are adaptations from MBCT and MBSR, where relaxation and breathing retraining or non-judgmental awareness of the body are attempted, respectively. In addition, virtual reality and culturally informed formats have been delivered to reduce the stigma associated with mental health, where attention to the session's content, facilitator's background, and language had a positive impact on retention rates. All the studies used the PCL-5 or its variations to monitor PTSD symptoms, with one using the FFMQ to monitor changes in awareness.

Despite its limitations, the findings add to our understanding of the complexities of treating PTSD in different populations. In these contexts, there is moderate evidence to support the notion that MBCT, MBSR, or its adaptations are effective in reducing PTSD symptomatology. Empirically, the role of MBCT has been proven in the reduction of cognitive alterations and comorbid substance misuse. Nevertheless, caution should be taken at baseline, where clients could experience an increase in their symptoms. On the other hand, MBSR tackled the hyperarousal of clients who experienced moderate to severe symptoms, whilst being iatrogenic for baseline mild trauma symptoms which had increased at the end of treatment. Although the higher symptomatology rates at the end of MBSR could be due to the higher attendance of participants presenting moderate to severe PTSD symptoms, a sensible practice would be only to conduct MBSR under these conditions.

Recommendations for future research

Methodologically, future studies will be enhanced by testing MBCT, MBSR, and its adaptations in a particular type of trauma and tailoring the intervention to a specific cultural background. Participants from both genders could be included although separated groups might be needed due to the nature of the trauma. A randomized controlled design, controlling for social interaction and professional care in the control group can aid the comparison with the intervention group. Due to the complexity of the disorder, comorbidities must be acknowledged and managed to inform the findings, such as secondary diagnosis and adjuvant interventions. While MBCT has been added to pharmacological treatment, it is unknown if it could be an adjuvant to other psychological interventions suggested by the NICE

Guidelines. Including trained instructors at an expert level in each treatment modality might have an impact on producing statistically significant results. Because MBSR and MBCT have an impact on different domains of the disorder, reports need to cover exhaustively the content of the sessions, where the incorporation of neuroimaging techniques can be valuable in symptoms monitoring. Formats where the participants do not remain anonymous and engagement can be controlled aid more information to the results, where the effectiveness of online treatment is still to be investigated. To conclude, the inclusion of a follow-up is relevant in determining if the improvements can be maintained without the support of a qualified practitioner.

Registration and protocol

The review was not registered. The protocol was prepared and amended as part of the CBT Postgraduate Diploma at Coventry University.

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Conflict of interest

The authors declare they have no conflicts of interest.

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  E-mail: jurb@imp.edu.mx

5. La segunda página debe contener los resúmenes del trabajo presentado en inglés y español. Cada resumen debe presentarse con un máximo de 250 palabras.
- Los resúmenes de los Artículos originales, Originales cortos y Revisiones sistemáticas deben estar conformados por: Introducción, Objetivo, Método, Resultados y Discusión y conclusión.
- El resumen de las Revisiones narrativas debe contener las siguientes secciones: Antecedentes, Objetivo, Método (bases de datos consultadas), 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 puede consultarse en: *http://www.nlm.nih.gov/mesh/MBrowser.html*.

6. A partir de la tercera página comienza el cuerpo del manuscrito, el cual debera conservar la misma estructura señalada en el resumen.
- **Introducción (o Antecedentes en el caso de las Revisiones narrativas).** Aquí se mencionarán los antecedentes en los que se sostiene la investigación, de modo que el lector comprenda la problemática tratada. El último párrafo de este apartado debe incluir de forma clara los objetivos del trabajo y, si se cree necesario, las hipótesis.
- **Método.** Debe presentarse suficientemente detallado para que el estudio pueda reproducirse. Por este motivo, es preciso que cuente con las siguientes secciones:

  • Diseño del estudio
  • Sujetos/descripción de la muestra
  • Sedes
  • Mediciones
  • Procedimientos
  • Análisis estadísticos
  • Consideraciones éticas
- **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 las 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), sexta edición.

9. Tablas y figuras. Salud Mental establece un máximo de cinco elementos gráficos en total, excepto en el caso de las comunicaciones cortas, las cuales solamente pueden incluir dos. El estándar solicitado para la elaboración de tablas y figuras es el de la American Psychological Association (APA), sexta edición. Éstas se colocarán en el mismo documento del manuscrito después de las referencias:
- Las tablas deben contener título y, en la parte inferior, una nota con el desglose de 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

Los siguientes documentos se adjuntan en el paso 4 del envío. Asegúrese de dar clic en “CARGAR” después de seleccionar cada archivo. De no hacerlo, los archivos no se adjuntarán al guardar y continuar con los demás pasos.

1. **Carta de autorización de uso de obra.** Todo artículo debe acompañarse de la Carta de autorización de uso de obra firmada por todos los autores y enviarse en formato PDF. El formato de la Carta de autorización de uso de obra está disponible en el siguiente enlace: *http://revistasaludmental.mx/Carta_autorizacion_uso_obra_final.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. En la carta se pueden sugerir tres revisores nacionales o internacionales calificados en el campo de conocimiento del manuscrito sometido, asegurándose de que éstos no tengan ningún conflicto de intereses con los resultados presentados. Ésta debe cargarse en formato PDF.
3. ***Checklist* de estándares metodológicos.** Es importante enviar el *checklist* debidamente contestado según las guías para cada tipo de estudio (veáse apartado de *CONSIDERACIONES METODOLÓGICAS*) y en formato PDF.

CONSIDERACIONES METODOLÓGICAS

Salud Mental adopta el sistema convencional de cinco por ciento como valor para la significancia estadística y no toma en cuenta las tendencias para valores mayores. Con el propósito de proporcionar mayor claridad a los lectores y revisores, es necesario que, de acuerdo con el tipo de estudio, los manuscritos se apeguen a los siguientes estándares:

- 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*).
- Los estudios cualitativos, a la guía COREQ (*https://academic.oup.com/intqhc/article/19/6/349/1791966/Consolidated-criteria-for-reporting-qualitative*).
- Los artículos de revisión, a las guías PRISMA (*http://www.prisma-statement.org/PRISMAStatement/PRISMAStatement.aspx*) y/o MOOSE (*http://www.ncbi.nlm.nih.gov/pubmed/10789670*).

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. No deben utilizarse letras negritas en el texto.
3. Las cursivas deben utilizarse para:
   - Destacar palabras extranjeras.
   - Enfatizar expresiones populares.
   - Mencionar títulos de libros, documentos ya publicados y publicaciones periódicas.
4. 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.
5. Las comillas dobles deben usarse solamente para:
   - Citar párrafos de otros autores dentro del texto.
   - Referir textualmente fragmentos del discurso de los sujetos de estudio.
6. En la medida de lo posible, se recomienda evitar el uso de cualquier otro tipo de énfasis como cursivas, negritas, subrayados o letras mayúsculas.
7. Evite el uso de paréntesis doble, es decir, un paréntesis dentro de otro. En su lugar utilice corchetes.
8. Pueden emplearse guiones largos para indicar oraciones parentéticas.
9. Deben utilizarse de forma correcta todos los signos de puntuación. Por ejemplo, si emplea signos de interrogación en un texto en español, debe colocar el de apertura y cierre correspondientes, de igual manera se debe proceder 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 o más.
2. Utilizar números cuando se trate de fechas, muestras, etc.
3. Incluir en los datos estadísticos los intervalos de confianza.
4. Escribir en cursivas los símbolos estadísticos (por ejemplo, *M, SD)*.
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 se deberá indicar 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. Anexamos la siguiente tabla que describe el contenido y el formato en el que es necesario presentar dichos documentos.

Documento	Contenido	Formato
1. Manuscrito	1. Primera página (página de título) 2. Segunda página (resúmenes) 3. Tercera página (cuerpo del artículo) con la siguiente estructura: - Introducción/Antecedentes - Objetivo - Método - Resultados - Discusión y conclusión - Declaraciones de los autores (Financiamiento, Conflictos de intereses y Agradecimientos) - Referencias - Tablas, figuras e ilustraciones.	Word. Se adjunta en el segundo paso del envío en la página web (“CARGAR EL ENVÍO”).
2. Carta de presentación	Breve presentación de las fortalezas, originalidad y aportaciones del artículo. En este espacio se pueden sugerir tres revisores para la evaluación del manuscrito.	PDF. Se adjunta en el paso 4 del envío (“CARGAR LOS ARCHIVOS COMPLEMENTARIOS”).
3. Carta de autorización de uso de obra	Este documento debe presentarse firmado por el autor responsable (a quien se dirigirá la correspondencia); además, debe contener los nombres y correos electrónicos de todos los coautores.	PDF. El formato está disponible en: *http://revistasaludmental.mx/Carta_autorizacion_uso_obra_final.pdf.* (“CARGAR LOS ARCHIVOS COMPLEMENTARIOS”).
4. *Checklist* de estándares metodológicos	Debe estar debidamente contestada según el tipo de estudio.	PDF. Se adjunta en el paso 4 del envío (“CARGAR LOS ARCHIVOS COMPLEMENTARIOS”).

UNA VEZ ENVIADO SU MANUSCRITO

El envío y la recepción del manuscrito, así como la resolución del proceso de evaluación, podrá consultarlos en el “ÁREA PERSONAL”.

Salud Mental recibe una gran cantidad de manuscritos, cuya calidad es determinada por el Comité de Evaluación Interno (CEI), encargado de comprobar que estos trabajos cumplan con los estándares de calidad establecidos: calidad metodológica, relevancia e innovación. Además, cada manuscrito es evaluado por pares externos que, en ocasiones, son miembros del Comité Editorial de la revista o expertos en el tema de la publicación y, en los casos en los que el autor haya sugerido dictaminadores, pueden ser elegidos de entre éstos.

Las posibles calificaciones que se pueden asignar a los manuscritos evaluados son: aceptado, publicable con modificaciones, reevaluable y no publicable. En función de los procesos de la Coordinación Editorial, Salud Mental estima un período de evaluación de tres a cuatro meses para el dictamen inicial del manuscrito y de uno a dos meses para la evaluación de segundas versiones, lo cual varía según el tipo de correcciones solicitadas.

GUIDELINE FOR AUTHORS

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

1. **Editorials**
   Written at the invitation of the Director-Editor of the journal. They must express authoritative opinions on specific topics of interest for the scientific community and the mental health field. They must also stimulate debate and promote new research lines. *Maximum extension: 1000 words*.
2. **Original articles (peer-reviewed section)**
   They present unpublished research results. They can be developed according to the following methodologies:
   - **Quantitative:** Comprehends primary and secondary results of transversal studies, clinical trials, cases and controls, cohorts, and quasi-experimental studies. *Maximum extension: 3500 words*.
   - **Qualitative:** They include reports of focus groups, in-depth interviews, semantic networks, and content analysis. *Maximum extension: 5000 words*.
3. **Brief original articles (peer-reviewed section)**
   They validate measuring instruments and preliminary results of original research. *Maximum extension: 2000 words*.
4. **Review articles (peer-reviewed section)**
   - **Narrative reviews.** They comprise narrative reviews based on national and international bibliography in accordance with the corresponding standards. *Maximum extension: 5000 words*.
   - **Systematic reviews.** They must adhere to standard methodologies (e.g. Cochrane), preferably, they should include a meta-analysis. *Maximum extension: 4000 words*.

- **Case reports**
  They include reports of atypical cases in clinical practice as well as the diagnosis approach and innovative procedures. *Maximum length 2000 words*.

N.B. the word count of each section does not consider title, abstracts and keywords, or sections on funding, conflict of interests and acknowledgments; neither does it consider words included in tables, figures and references.

LANGUAGES

Salud Mental publishes manuscripts in Spanish and English. However, the publication of articles in English is preferred for the benefit of the international scientific community.

ETHICAL ASPECTS IN PUBLISHING

For Salud Mental it is important to observe the ethical policies of scientific publishing, Because of this, it is essential for the editors that every research involving animal and/or human subjects adheres to national and international regulations of basic, clinical, and social research. All clinical research articles must adhere to the ICJME international regulations.

SUBMISSION DECLARATION

By submitting an manuscript, the author states that:

1. The work has not been previously published (except as a summary or as a part of a lecture or a degree thesis).
2. It is not currently under review in any other journal in any language.
3. The work has been authorized by all co-authors and responsible authorities of the place where it was carried out.

AUTHORSHIP

Only those individuals who actively participated in the process of research and drafting of the manuscript should be considered as authors. Owing to this, Salud Mental accepts five coauthors maximum (in addition to the main author). In the case of projects involving multiple research groups and requiring the inclusion of more than five coauthors, the main author must justify their inclusion in the Cover letter.

SUBMIT YOUR PUBLICATION

Manuscripts must be exclusively submitted through the website available at: *http://revistasaludmental.mx* Prior to the submission of a manuscript, the sender needs to be registered as an author. Before making a submission, make sure to click on UPLOAD every time a file is added. In step 1 you must fill the checklist to declare you fulfill the policies established by the journal. In step 2, the Microsoft Word manuscript is attached. It must not include notes or track changes and must comply with each requirement listed in Guidelines for Authors. The main data will be requested in step 3. In step 4, Copyright Assessment and Cover letter must be attached in PDF.

EDITORIAL GUIDELINES

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

1. Manuscripts must be clear and concise, avoiding spelling, grammar, and syntax mistakes.
2. The text must be written in Microsoft Word format, Times New Roman 12, with double spacing and 2.5 centimeters margins, in letter size paper.
3. Pages must be numbered in a consecutive order, beginning by the title page, with numbers placed in the upper right corner.
4. The title page should contain the following ordered sections:
   - **Title of the study in Spanish and English.** The title must be descriptive and indicate the study's main results.
   - **Short title.** Six words at most.
   - **Full name(s) of the author and coauthors.** The order in which this information is provided will be preserved in the manuscript's possible publication and registration in databases. Authors' full names must be separated by a comma. Then, following this punctuation mark, an Arabic numeral in superscript, with no intermediate space, will indicate the affiliation institution. Following each author's superscript number, their full affiliation must be stated, specifying their particular area of work therein.
   - **Author's affiliation.** This is indicated in Arabic numerals as superscripts. Affiliations are placed immediately below authors' names, not as footnotes. It is necessary that the ascription specifies: department, area, institution, city and country for each author, without indicating a postal address. The institutions must be written in their official language. The authors' degrees or positions (PHD, doctor, resident, researcher, etc.) must not be included.

     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.
   - At the bottom of the first page, the legend "**Correspondence:**…" must be placed, mentioning the corresponding author and including affiliation with postal address, telephone number and email. This will be the only author addressed by Salud Mental during the entire 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 must present the abstract of the work in Spanish and English. Each abstract must be 250 words maximum.
   - The abstracts of Original articles, Brief original articles, and Systematic reviews must comprise: Introduction, Objective, Method, Results, and Discussion and conclusion.
   - In the cases of Narrative reviews, the order of the abstract must be: Background, Objective, Method (databases consulted), Results, and Discussion and conclusion.
   - **Keywords.** At the end of each abstract, four key words minimum and six maximum must be included, separated by commas and in lowercase. Keywords must be the same in Spanish and English. As these are used in the articles' indexation, at least three of them must be based on MeSH (Medical Subject Headings), consulting *http://www.nlm.nih.gov/mesh/MBrowser.html*.
6. The manuscript proper begins in page three, following this structure:
   - **Introduction (**or **Background** in the case only of Narrative reviews)**.** The research's background is disclosed here for the reader to understand the problem being dealt with. The final paragraph of this section must clearly state the objectives of the work, and if deemed necessary the hypotheses.
   - **Method.** It must be sufficiently detailed so that the study can be reproduced. It must include the following sections:
     • Design of the study
     • Subjects / description of the sample
     • Places
     • Measurements
     • Procedures
     • Statistical analysis
     • Ethical considerations
   - **Results.** They are presented following a logical sequence in the text and making use of tables, graphs, and figures.
   - **Discussion and conclusion.** This section highlights new and important aspects of the study, conclusions drawn from it, possible implications of the findings, and its limitations if any.
7. After the Discussion and conclusion, the authors' declarations are listed in the following order:
   - **Funding.** In this section, it must be declared if the study or the manuscript preparation received any funding, indicating the name of the financing entity.

     For example:

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

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

     For example:

     None.
   - **Conflict of interest.** Authors must declare here if they have any conflict of interest regarding their scientific activity. Having a conflict of interest does not necessarily pose an impediment to publish the manuscript. If there is no conflict of interest, the following must be written: "The authors declare they have no conflicts of interest."
   - **Acknowledgments.** When deemed necessary, after the declarations, acknowledgements for people, centers, or entities that collaborated or supported the research must be mentioned.
8. **References** are placed after the authors' declarations (Funding, Conflicts of interest, and Acknowledgements), following exclusively the Publication Manual of the American Psychological Association (APA), sixth edition.
9. **Tables and figures.** Salud Mental establishes a limit of five graphic elements maximum, excepting the case of short communications, which may only include two. The standard required for tables and figures is also APA's, sixth edition. Tables and figures must be included in the same file of the manuscript after References:
   - Tables must bear a title on top and a note below with legends for the initials.
   - Figures must be sent in high resolution (at least 300 dpi).
   - The titles and footnotes of the tables and figures must be clear and brief and bear always an identifying number. In the text, the author must indicate in parentheses and in capital letters wherein the text the graphic elements should be placed.

     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

The following documents are attached in Step 4 in Submission. Make sure to click "UPLOAD" after selecting each file; if this is not done, the files will not be attached when saving and continuing to the next steps.

1. **Copyright assignment.** Each manuscript should include this letter signed of all the authors and must be sent in PDF. The official format of this letter is available at: *http://revistasaludmental.com/Copyright_assessment.pdf*
2. **Cover letter.** The main author must expose the strengths of manuscript scientific output, underscoring the scope, originality, and importance of its contributions to the field of mental health. In the letter, three national or international reviewers qualified in the submitted manuscript's field of knowledge may be suggested, making sure they do not have any conflict of interest with the results presented. This letter must also be uploaded in PDF format.
3. **Checklist of methodological standards.** It is important to send the checklist duly completed following the guides for each sort of study (see Methodological Considerations) in PDF format.

METHODOLOGICAL CONSIDERATIONS

Salud Mental adheres to the conventional system of 5-percent value for statistical significance and does not consider tendencies for higher values. For readers and reviewers to have a better clarity, it is necessary that, depending on the sort of study, manuscripts adhere to the following standards:

- Randomized clinical trials must follow the CONSORT Statement.
- Studies with nonrandomized designs must follow the TREND Statement.
- Transversal, cohort and cases, and control studies must follow the STROBE Statement.
- Qualitative studies must follow the COREQ.
- Review articles must follow the PRISMA Statement and/or the MOOSE Guidelines.

EMPHASIS AND PUNCTUATION

1. Although it is important for authors to avoid using footnotes in manuscripts as much as possible, they can be used if it is clearly necessary.
2. Bold letters should never be used in the main text.
3. Italics must be used for:
   - Distinguishing foreign words.
   - Emphasizing popular expressions.
   - Book titles, published documents, and periodical publications.
4. Italics may be used for:
   - Calling the attention to significant or important terms when they are mentioned for the first time.
   - Highlighting a word or phrase in a quotation.
5. Inverted commas must be used only for:
   - Quoting other authors' paragraphs in the text.
   - Textually quoting fragments of discourse of the subjects under study.
6. As much as possible, it is recommended to avoid using any other sort of emphasis such as italics, bold, underlining, or capital letters.
7. Avoid using double parentheses, that is, a parenthesis inside another. Use brackets instead.
8. Dashes may be used to indicate subordinate or other explanatory sentences.
9. Every punctuation mark must be correctly used. For example, in the case of questions, a question mark must close the question. Likewise, opening and closing inverted commas must be used.

MATHEMATICAL AND STATISTICAL FORMULAE

To present the results the following must be considered:

1. Write numerals from zero to nine in words and from 10 onwards in figures.
2. Use numbers in the case of dates, samples, and so on.
3. Include confidence intervals in statistical data.
4. Write statistical symbols in italics *(M, SD)*.
5. Use the exact probability with two or three decimals (e.g., p = .04; p = .002) with no zero before the decimal point. If it is lower than 001, indicate it as < .001.
6. Leave a space before and after each sign (a + b = c, instead of a+b=c).
7. Use points instead of commas to indicate decimals.

VERIFY THE FOLLOWING BEFORE SUBMITTING YOUR MANUSCRIPT

Before submitting your manuscript, make sure to upload the documents requested. We present a table describing the content and format in which such documents must be presented.

Document	Content	Format
1. Manuscript	1. First page (title page) 2. Second page (abstracts) 3. Third page (text of the article) with the following structure: ● Introduction/Background ● Objective ● Method ● Results ● Discussion and conclusion ● Authors' declarations (funding, conflict of interests, and acknowledgements) ● References ● Tables, figures, and illustrations.	Microsoft Word. It is attached in Step 2 in Submission at the website.
2. Cover letter	Brief presentation of the strengths, originality, and contributions of the article. Up to three reviewers may be may suggested to assess the manuscript.	PDF. It is attached in Step 4 in Submission ("UPLOAD COMPLEMENTARY FILES").
3. Copyright assignment	Signed by all the authors.	PDF. You can download the form in *http://revistasaludmental.com/Copyright_assessment.pdf* It must be attached in Step 4 in Submission ("UPLOAD COMPLEMENTARY FILES").
4. Checklist of methodological standards	Duly completed according to the sort of study.	PDF. It is attached in Step 4 in Submission ("UPLOAD COMPLEMENTARY FILES").

ONCE YOUR MANUSCRIPT HAS BEEN SUBMITTED

The submission and reception of the manuscript as well as the outcome of its review process may be consulted at "User Home."

Salud Mental receives a large amount of manuscripts, the quality of which is judged by an Internal Review Board (IRB). This Board verifies that each manuscript meets the established quality standards: methodological quality, relevance, and innovation. Each manuscript is also reviewed by external peers who, on occasion, are members of the journal's Editorial Committee or experts in the area of interest of the submitted text. In those cases in which authors have suggested reviewers, the reviewers can be chosen by the Editor. The possible outcomes for the manuscripts assessed are: accepted submission, revisions required, resubmit for review, and declined submission. In accordance with the processes of the Editorial Coordination, Salud Mental estimates an assessment period of three to four months for the initial review of the manuscript and one to two months for second versions, depending on the modifications requested.