Neuropsychiatric Disease and Treatment

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ORIGINAL RESEARCH

Validation of the Spanish Version of the Trauma and Loss Spectrum Self-Report (TALS-SR): A Study on Healthcare Workers Facing the COVID-19 Pandemic

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Background: The present study aimed at reporting about the validity and reliability of the Spanish version of the Trauma and Loss Spectrum-Self Report (TALS-SR), an instrument based on a multidimensional approach to Post-Traumatic Stress Disorder (PTSD) and Prolonged Grief Disorder (PGD), including a range of threatening or traumatic experiences and significant losses, besides the spectrum of peri-traumatic stress reactions and post-traumatic stress symptoms that may occur.

Methods: A sample of 87 Health Care Workers (HCWs) employed in the COVID-19 Emergency Department at the Virgen de la Arrixaca and Reina Sofia Hospitals (Murcia, Spain) during the pandemic, was consecutively recruited and fulfilled the TALS-SR. Assessments also included the Impact of Event Scale-Revised (IES-R), to examine post-traumatic stress symptoms and probable PTSD. Nineteen HCWs fulfilled the TALS-SR again after three weeks from baseline for test–retest reliability.

Results: This study provides evidence of good internal consistency and test–retest reliability of the Spanish version of the TALS-SR. Strong support for the internal validity structure was obtained, with positive and significant correlations between the five symptomatologic domains and the symptomatologic total score. Significant and good correlations between the TALS-SR symptomatologic domains and the IES-R total and single domains' scores were found. The Questionnaire also demonstrated to discriminate between subjects with and without PTSD, with subjects with PTSD showing significantly higher mean scores in each domain of the TALS-SR.

Conclusion: This study validates the Spanish version of TALS-SR, providing a useful instrument for a spectrum approach to PTSD and confirms the potential utility of this psychometric tool in both clinical practice and research settings.

Keywords: mental health, stress disorders, traumatic, PTSD, psychological distress, health personnel, psychological tests

Introduction

Post-Traumatic Stress Disorder (PTSD) is one of the mental disorders that reported the most relevant changes across most recent editions of psychiatric nosography[1,2] and the COVID-19 pandemic gave a strong impulse to the awareness and knowledge of trauma-related psychopathology not only in the general population but also in specific at high-risk settings, such as HealthCare Workers (HCWs) exposed frontline to the infectious threat, giving further evidence of this diagnostic construct.[3–7]

Consistently, a long debate has also been devoted to the role of not only full-blown but also subthreshold forms of the Disorder,[8,9] highlighting the impact on work and social functioning, as well as the need for treatment also required by these cases. Interestingly, the recent COVID-19 pandemic has supported the relevance of specifically addressing not only PTSD but also specific symptoms of the Disorder for their impact also on the onset or worsening of many co-occurring

Received: 7 November 2022
Accepted: 17 December 2022
Published: 3 March 2023

mental disorders, in the framework of a reciprocal influence.[10] In the framework of this long debate, the concept of a spectrum approach was developed and, according to a multidimensional spectrum model of Post-TraumaticStress Disorder, carried out as part of an international Italy–USA collaborative research project, named *Spectrum Project* (see www.spectrum-project.org). The *Spectrum Project* approach is founded on a dimensional approach to psychopathology that emphasizes not only threshold-level manifestations of PTSD but also low-grade and atypical symptoms, besides behavioral traits and temperamental features associated with established diagnostic constructs.[11,12] To investigate the "Trauma and Loss Spectrum", the Trauma and Loss Spectrum-Self Report (TALS-SR) questionnaire was created.[13,14] The TALS-SR is a self-report instrument consisting of 116 questions, structured in 9 domains, exploring the presence over a lifelong period of a range of symptoms that can be attributed to loss and/or traumatic events, as well as behaviors and individual features that could represent expressions and/or risk factors for the development of a stress-related syndrome.[13] The 116 items of the questionnaire are coded dichotomously (yes/no) and clustered into 9 domains comprising loss events (I); grief reactions (II); potentially traumatic events (III); reactions to losses or upsetting events (IV); re-experiencing (V); avoidance and numbing (VI); maladaptive coping (VII); arousal (VIII); and personal characteristics/risk factors (IX). The TALS-SR was designed to assess potentially traumatic events and symptoms of posttraumatic stress in both its subthreshold and atypical forms up to the full-blown disorder, as described by the diagnostic criteria of the DSM-5-TR. This includes all major diagnostic criteria for the definition of PTSD, in addition to personality traits and behavioural manifestations that may be associated with subthreshold or partial forms of the Disorder. The first two domains of the instrument address spectrum symptoms related to the clinical conditions recently introduced as PGD in the DSM-5-TR, previously acknowledged as Complicated Grief, or Traumatic Grief.

This spectrum-conceptualized instrument has appeared to be useful for a variety of research purpose but also clinical ones, such as accurate psychopathological characterization and earlier identification of even subthreshold cases, treatment selection, assessment of lifetime longitudinal psychopathological trajectories and treatment outcomes, and clinical follow-ups.[13] The TALS-SR has been, in fact, adopted across several studies including not only clinical populations, such as subjects with PTSD, bipolar disorder, borderline personality disorder, prolonged grief disorder,[15–17] but also in the general population exposed to mass trauma,[18] rescuers and healthcare workers,[19,20] these latter also in the framework of the COVID-19 pandemic.[21] Much evidence of adverse psychological outcomes related to the COVID-19 pandemic have been reported since the infectious outbreak and the TALS-SR have been widely used as a spectrum instrument adopted to assess post-traumatic stress spectrum symptomatology.[3,22]

In light of this evidence, in the framework of an international clinical and research collaboration project during the COVID-19 emergency between researchers from the University of Pisa and of the University of Murcia, upon the expertise developed by the former in the support to first-line healthcare workers facing the pandemic,[23,24] a Spanish version of the TALS-SR was developed, with the purpose of detecting psychological distress in this population and, in parallel, of making a Spanish version of the tool available.

Therefore, the aim of this study was to report about the validity and reliability of the Spanish version of the TALS-SR instrument. Further, the secondary aim of the study was to explore the possible interplay between PTSD and global functioning impairment among the study participants.

Materials and Methods

Study Sample

The sample included 87 HCWs working at two Major University Hospitals in Spain (Virgen de la Arrixaca and Reina Sofia of Murcia Hospitals, Murcia, Spain) during the COVID-19 outbreak and consecutively recruited from May to September 2021, specifically during the so-called "fifth COVID-19 wave" in the Country. All HCWs enrolled experienced potentially traumatic events related to the management of hospitalized patients suffering from COVID-19, including critical illness, and were asked to fulfill the Spanish version of the TALS-SR. Inclusion criteria comprised being employed at the Virgen de la Arrixaca e Reina Sofia of Murcia Hospitals (Murcia, Spain) during the COVID-19 pandemic and being exposed to potentially traumatic events related to their work duties and the COVID-19 patients' management. Exclusion criteria comprised poor knowledge of Spanish language or other limits to verbal communication.

All participants provided a written informed consent upon the opportunity to ask questions and filled out an online questionnaire created via the Google Forms platform, after being clearly informed about the study. All data were collected anonymously. The study was conducted in accordance with the Declaration of Helsinki and the Ethics Committee of the University of Murcia approved all recruitment and assessment procedures (Murcia, Spain, protocol study ID: 3448/2021).

Assessments included the TALS-SR, Spanish version, to investigate the trauma and loss spectrum symptoms; the Impact of Event Scale-Revised (IES-R),[25] to investigate post-traumatic stress symptoms and probable PTSD; the Work and Social Adjustment Scale (WSAS),[26] to evaluate and measure the work and social adjustment; a socio-demographic datasheet (including gender, age, occupational role and hospital unit of employment). A subsample of 19 randomly selected HCWs was asked to fulfill again the TALS-SR Spanish version after three weeks from initial assessment, for test–retest reliability.

Procedure

The procedure of translation and adaptation of the original Italian version of the TALS-SR questionnaire into Spanish was performed as follows. First, a native Spanish speaker psychiatrist, fluently speaking in Italian, provided to translate the original Italian version of the TALS-SR questionnaire into Spanish, being aware of the study objectives. The resulting doubts in the translation of the instrument, including the wording of some questions of the items, were therefore resolved by referring to the English version of the questionnaire. Second, a back-translation of the Spanish-translated TALS-SR into Italian was then completed by an Italian native speaker fluent in Spanish, who was not familiar with the original Italian version of the TALS-SR and unaware of the research aims.

Third, a consensus of experts affiliated with the Universities of Pisa and Murcia reviewed the two versions of the translated instrument, making only minor adjustment to the TALS-SR Spanish version, agreeing on the accuracy of the translation and finally approving the translated version of the Questionnaire.

Assessment Instruments

The Trauma and Loss Spectrum-Self Report (TALS-SR)

The TALS-SR questionnaire includes 116 items exploring the lifetime experience of a range of loss and/or traumatic events and lifetime symptoms, behaviors and personal characteristics that might represent manifestations and/or risk factors for the development of a stress-related syndrome. Item responses are coded in a dichotomous way (yes/no). The instrument is organized into nine domains, investigating specifically: loss events (I); grief reactions (II); potentially traumatic events (III); reactions to losses or upsetting events (IV); re-experiencing (V); avoidance and numbing (VI); maladaptive coping (VII); arousal (VIII); and personal characteristics/risk factors (IX). The questionnaire investigates both a comprehensive set of traumatic and loss events that may occur in the lifetime and a broad spectrum of symptoms related to these events. The post-traumatic stress spectrum symptomatology is explored by the instrument along two dimensions: (1) the dimension of acute and peri-traumatic reactions and (2) the dimension of the post-traumatic stress spectrum psychopathology, including symptoms described in DSM criteria for PTSD, as well as sub-threshold and atypical manifestations eventually arisen after the event(s). Further, events themselves listed in the questionnaire are meant along a wide dimension (3), since they include potentially traumatic and loss events, as conceptualized by the DSM-5-TR in the criterion A for PTSD, but also lower-severity traumatic events, also defined as low magnitude events, which may turn out to be traumatic for the subject. So, in the framework of a dimensional approach, the Questionnaire is useful at also highlighting the wide spectrum of trauma- and stress-related manifestations that may follow different kinds of stressful experiences across the lifespan. In the validation study of the instrument, all Kuder-Richardson coefficients for TALS-SR exceeded the minimum standard of 0.50, and the instrument demonstrated positive correlations between its domains (Pearson's r ranging from 0.46 to 0.76).[13]

In the present study, the total score of the TALS-SR (total symptomatologic score) was calculated taking into account the so-called "symptomatologic domains" [reactions to losses or upsetting events (IV); re-experiencing (V); avoidance and numbing (VI); maladaptive coping (VII); arousal (VIII)] on account of the fact that domains I, III and IX of the TALS-SR include checklists of events or personality characteristics rather than PTSD symptoms.[13]

According to the aim of the study, the TALS-SR items referred to the traumatic experience of participants, related to work duties during the COVID-19 pandemic and the COVID-19 patients' management.

Impact of Event Scale-Revised (IES-R)

Participants were also assessed by means of the Impact of Event Scale-Revised (IES-R),[25] to investigate post-traumatic stress symptoms and PTSD. The 22-item Impact of Event Scale-Revised (IES-R), is a self-report questionnaire, specifically tailored to assess probable PTSD by covering three symptoms' clusters (intrusion, avoidance, and hyperarousal), which showed good psychometric properties and high internal consistency.[27] The IES-R scale is scored on a 5-point Likert-like scale from 0 (not at all) to 4 (extremely), with a total score range calculated between 0 and 88 and a score equal or above 33 indicating a probable PTSD diagnosis.

This scale is also one of the most commonly used questionnaires to screen rescue workers and HCWs for mental health problems,[28,29] also in the context of COVID-19 pandemic.[30]

Work and Social Adjustment Scale (WSAS)

It includes five items assessing the individual's ability to perform the activities of everyday life and how these are affected in the week prior to the assessment.[26] Each of the five items is rated on a nine-point scale ranging from 0 (not at all) to 8 (severe interference), with total scores between 0 and 40. The internal consistency of the instrument varies from 0.70 to 0.94 (Cronbach's alpha) and the reliability of the test–retest is 0.73.

Statistical Analyses

The sample size in the study protocol was calculated considering a minimum sample size such as to ensure a power of at least 0.8 for the determination of the Pearson's correlation coefficient for convergent validity and for the comparison of the total TALS-SR score for known groups validity, as well as of the Intra-Class Coefficient (ICC) for test–retest reliability.

Calculations were performed with a maximum of 100 subjects and a minimum of 80 subjects. In particular, for convergent validity, predicting a Pearson's correlation coefficient of at least 0.40 guaranteed a power of 0.987 in the case of 100 subjects and of 0.963 in the case of 80 subjects; for the known group's validity, predicting an average difference of the total scores in the two samples corresponding to 10 points and an expected standard deviation within the groups equal to 15, a power of 0.910 could be obtained. Under the same conditions of mean difference and expected standard deviation in two samples of 40 subjects each, a power of at least 0.80 could still be achieved. Finally, for the determination of the test–retest reliability on a subsample of subjects, an expected ICC of at least 0.65 could guarantee a power of 0.95.

To evaluate the internal consistency of the Spanish version of the TALS-SR, Kuder-Richardson coefficients were calculated both for each domain and for the total score of the questionnaire. Changes in coefficient with deleted items were examined in order to determine how each item influences the reliability of instruments.

Test–retest reliability of the TALS-SR was performed by calculating the intra-class coefficient (ICC), in a subsample (N = 19) of subjects re-evaluated three weeks after the initial assessment.

We assessed the convergent validity of the TALS-SR by exploring the correlations (defined through the Pearson's correlation coefficients) between each domain of the TALS-SR and the three subscales of the IES-R, as well as between the total scores of these two psychometric tools.

We determined the known-groups validity of the TALS-SR by means of a Mann–Whitney *U*-test, by comparing both TALS-SR total and each domain's mean scores of between subjects who scored above the cut-off for PTSD by means of the IES-R scale and those who did not.

Finally, comparative analyses were performed using Student's *t*-test for parametric variables and Mann–Whitney test for nonparametric variables. In the case of comparison of categorical variables, chi-squared test was utilized.

Statistical analyses were performed using the Statistical Package for Social Science, version 26.0 (SPSS Inc.). Continuous variables were reported as mean ± Standard Deviation (SD), whilst categorical variables were reported as percentages. All tests were two-tailed with a p-value of <0.05 considered statistically significant.

Results

The total sample included 87 subjects, 32 (36.8%) males and 55 (36.2%) females, with a mean age of 44.32 ± 10.13 years. Regarding occupational role, 46 (52.9%) subjects were physicians, 31 (35.6%) were nurses and 10 (11.5%) other HCWs. Thirty-eight (56.3%) HCWs in the sample reported an IES-R score over 32, compatible with a probable PTSD diagnosis. The sample was therefore divided into two subsamples based on the IES-R scores, hence including subjects with PTSD in the first (PTSD group) and subjects without PTSD in the other (No-PTSD group). Socio-demographic and job-related characteristics in the overall sample, in the PTSD group and in the No-PTSD group were summarized in Table 1. The mean score (±SD) of the IES-R and TALS-SR scale were 10.03 ± 11.47 and 42.81 ± 18.33, respectively. A subsample of 19 randomly selected HCWs was asked to fulfill again the TALS-SR Spanish version after 3 weeks from initial assessment, for test–retest reliability.

Socio-demographic and occupational characteristics in subjects with and without PTSD revealed some significant differences. In particular, significantly higher PTSD rates emerged in nurses with respect to physicians [23 (46.9) vs 19 (38.8), p = 0.011]; HCWs working in COVID-19 ICU with respect to those employed in Surgical and Emergency Department Units [8 (16.3) vs 6 (12.2) and 6 (15.8%), respectively, p = 0.011]. Further, subjects with PTSD reported to be younger than those without PTSD (42.61 ± 9.87 vs 46.53 ± 10.17, p = 0.074).

Reliability

Kuder-Richardson coefficients and ICC for the TALS-SR total and single domains are provided in Table 2.

Table 1 Socio-Demographic and Occupational Characteristics in the Overall Sample (N = 87) and Comparison Between Subjects with (N = 38) and without PTSD (N = 49)

	Total	PTSD Group	No PTSD Group	χ^2	p	Post-Hoc
	N (%)	N (%)	N (%)			
Gender						
Males Females	32 (36.8) 55 (63.2)	14 (43.8) 35 (63.6)	18 (56.3) 20 (36.4)	2.494	0.114	-
Occupational role						
Physicians [a]	46 (52.9)	19 (38.8)	27 (71.1)	9.002	0.011	b>a
Nurses [b]	31 (35.6)	23 (46.9)	8 (21.1)			
Other HCWs [c]	10 (11.5)	7 (14.3)	3 (7.9)			
Unit						
Internal Medicine [a]	5 (5.7)	3 (6.1)	2 (5.3)	16.682	0.011	f>b,e
Surgical Unit [b]	17 (19.5)	6 (12.2)	11 (28.9)			
No COVID-19 ICU [c]	25 (28.7)	12 (24.5)	13 (34.2)			
Pneumology [d]	3 (3.4)	2 (4.1)	1 (2.6)			
Emergency Department [e]	8 (9.2)	2 (4.1)	6 (15.8)			
COVID-19 ICU [f]	8 (9.2)	8 (16.3)	0 (0.0)			
COVID-19 ward [g]	21 (24.1)	16 (32.7)	5 (13.2)			
	Total Mean (±SD)	PTSD Mean (±SD)	No PTSD Mean (±SD)	*t*-test	p	Post-hoc
Age (years)	44.32±10.13	42.61±9.87	46.53±10.17	1.810	0.074	-

Table 2 Internal Consistency (Kuder-Richardson Coefficient) and Test–Retest Reliability (Intraclass Correlation Coefficient, ICC) of TALS-SR Total and Domains

TALS-SR Domains	#Items	Kuder-Richardson Coefficient (N = 87)	95% CI	Intraclass Correlation Coefficient (ICC) (N = 19)	95% CI
I-Loss events	10	/	/	/	/
II-Grief reactions	27	0.951	0.935–0.965	0.516	0.104–0.780
III-Potentially traumatic events	20	/	/	/	/
IV-Reaction to losses or upsetting events	18	0.919	0.892–0.942	0.630	0.267–0.838
V-Re-experiencing	9	0.897	0.861–0.926	0.880	0.721–0.952
VI-Avoidance and Numbing	11	0.903	0.869–0.930	0.772	0.506–0.905
VII-Maladaptive coping	8	0.639	0.512–0.743	0.933	0.837–0.973
VIII-Arousal	5	0.860	0.807–0.902	0.657	0.310–0.851
IX-Personal characteristics-risk factors	7	/	/	/	/
Total symptomatologic score*	51	0.961	0.949–0.972	0.808	0.575–0.921

Note: *Sum of TALS-SR domains IV,V,VI,VII,VIII.

The reliability of the TALS-SR total score was excellent, with a Kuder-Richardson coefficient of 0.961. The reliability coefficients for the TALS-SR symptomatologic domains IV (Reaction to losses or upsetting events), V (Re-experiencing), VI (Avoidance and numbing) and VIII (Arousal) were also good, exceeding the value of 0.70 and ranging from 0.832 to 0.919. Only the Maladaptive coping domain (VII) showed a lower level of reliability (0.639).

Each item provided a relevant contribution to the scale because Kuder-Richardson coefficient decreased when each item in turn was deleted.

The three-week test–retest reliability performed by calculating the ICC on 19 randomly selected HCWs who were asked to fulfill again the TALS-SR was found to be good. Test–retest reliabilities found in fact were high, with an ICC of 0.808 for the total symptomatologic score and ranging from moderate (0.630) to substantial (0.933) values for the single domains (see Table 2).

Validity of the Internal Structure

The correlations between TALS-SR domains and the total score were found to be positive and significant ($p < 0.001$), with Pearson's r ranging from 0.671 to 0.910 (see Table 3).

Convergent Validity

Correlations between the TALS-SR and the IES-R total and single domains' scores were all significant (p=<.001) and summarized in Table 4. For overall scores, Pearson's correlation coefficient between TALS-SR and IES-R total score was found to be good (0.518). As expected, the TALS-SR domains revealed to be significantly and positively correlated with both the three IES-R domains (IES-R Intrusion, IES-R Avoidance, IES-R Hyperarousal) and the total scores, with the only exception for domain VII (Maladaptive coping) showing the lowest associations with the three IES-R domains, ranging from 0.397 to 0.402.

Table 3 Correlations Between TALS-SR Symptomatologic Domains and Total Symptomatologic Scores in the Overall Sample (N = 87)*

TALS-SR Domain Scores	TALS-SR Symptomatologic Total Score
IV-Reaction to losses or upsetting events	0.910
V-Re-experiencing	0.879
VI-Avoidance and Numbing	0.876
VII-Maladaptive coping	0.671
VIII-Arousal	0.801

Note: *All correlations were significant at the p<0.001 level (two-tailed).

Table 4 Correlations Between the TALS-SR and IES-R Total and Domain Scores in the Overall Sample (N = 87)*

TALS- SR Domains	IES- R Intrusion	IES- R Avoidance	IES-R Hyper Arousal	IES-R Total
IV- Reaction to losses or upsetting events	0.440	0.410	0.439	0.447
V- Re-experiencing	0.485	0.427	0.443	0.472
VI- Avoidance and Numbing	0.409	0.429	0.446	0.443
VII- Maladaptive coping	0.402	0.363	0.378	0.397
VIII- Arousal	0.427	0.393	0.451	439
Total symptomatologic score	0.507	0.478	0.508	0.518

Note: *All Pearson's correlation coefficients were all significant at the p< 0.001 level, two tailed.

Known Groups Validity

In a *t*-test for independent samples, subjects with PTSD (as scored with an IES-R score above 32) presented statistically significant higher scores in TALS-SR domains III (Potentially traumatic events), IV (reactions to losses or upsetting events), V (Re-experiencing), VI (Avoidance and Numbing), VII (Maladaptive coping), VIII (Arousal) and IX (personal characteristics-risk factors) and in the TALS-SR total score with respect to those without PTSD (see Table 5).

Global Functioning Impairment

Finally, by comparing each WSAS item's mean scores between subjects who scored above the cut-off for PTSD by means of the IES-R scale and those who did not, subjects with PTSD reported significantly higher scores in all WSAS items with respect to those without (see Table 5).

Discussion

The present study reports about the validity and reliability of the Spanish version of the Trauma and Loss Spectrum Self-Report.[13] Results showed the Questionnaire featuring good reliability and validity.

The reliability was found to be excellent for the total symptomatologic score, as confirmed by the Kuder–Richardson's coefficient in the overall sample (0.961), and good for all the symptomatologic domains, with the highest coefficients (0.919) being reported from the Domain IV (Reaction to losses or upsetting events) and the lowest (0.639) from the Domain VII (Maladaptive coping). It is important to notice that the relatively low values for the maladaptive subscale are not surprising. This domain, in fact, comprises only 9 items that may impact on the reliability coefficient with respect to other longer domains.[13] Some studies have also pointed out the fact that maladaptive coping strategies (such as substance or self-destructive behaviors) used to cope with distressing memories of traumatic experiences in PTSD, may reflect an overlap with other psychopathological dimensions and in general with comorbid mental disorders

Table 5 Comparison on TALS-SR Total and Domain Scores and on WSAS Item Scores Between Subjects with PTSD (PTSD Group, N = 38) and Subjects without PTSD (No PTSD Group, N = 49)

TALS-SR Domains	PTSD Group (mean±SD)	No PTSD Group (mean±SD)	z	p
I-Loss events	1.02±1.27	0.66±1.10	1.453	0.146
II-Grief reactions	5.18±7.07	2.32±4.22	1.465	0.143
III-Potentially traumatic events	1.90±1.98	0.79±1.32	3.089	0.002
IV-Reaction to losses or upsetting events	4.90±5.32	1.58±1.95	2.313	0.021
V-Re-experiencing	3.10±3.19	0.79±1.23	2.997	0.003
VI-Avoidance and Numbing	3.41±3.57	1.00±1.90	3.136	0.002
VII-Maladaptive coping	0.90±1.19	0.11±0.31	4.236	<0.001
VIII-Arousal	2.16±1.97	0.84±1.38	3.309	0.001
IX-personal characteristics-risk factors	1.31±1.00	0.50±.95	4.179	<0.001
WSAS Items	**PTSD Group (mean±SD)**	**No PTSD Group (mean±SD)**	**z**	**p**
I-ability to work impairment	4.12±1.95	1.84±1.33	5.377	<0.001
II-home management impairment	4.22±2.05	1.76±1.26	5.636	<0.001
III-social leisure activities impairment	4.53±2.21	1.87±1.34	5.522	<0.001
IV-private leisure activities impairment	5.61±2.07	2.66±1.95	5.456	<0.001
V-close relationships impairment	4.49±2.10	1.84±1.20	5.819	<0.001

with PTSD, such as mood, anxiety and personality disorders, as well as addictions in general.[30,31] However, while considering maladaptive strategies as core symptoms of PTSD reactions, it is important to notice that studies on HCWs during the COVID pandemic,[4,24] and even pre-pandemic ones in similar samples of rescue workers,[19,20] showed consistent low levels of maladaptive behaviors, suggesting a particular role of traumatic exposure due to emergency situations related to the on duty across rescue workers for these specific symptoms. The result concerning the reliability for Domain VII replicates those of Dell'Osso et al (2008),[14] concerning the validation of the structured clinical interview of the instrument, namely Structured Clinical Interview for the Trauma and Loss Spectrum (SCI-TALS) that found the lowest Kuder Richardson's coefficient from the "Maladaptive coping" domain of the instrument.

Results also showed that the Spanish TALS-SR scores are reliable over time. We found excellent agreement administering TALS-SR a mean of three weeks apart. Intraclass correlation coefficient was good for the total symptomatologic score and ranging from moderate (0.630) to substantial (0.933) values for the single domains.

On the other hand, strong support for the internal validity structure was obtained, with correlations between the five symptomatologic domains and the TALS-SR symptomatologic total score found to be positive and significant, with Pearson's r ranging from 0.671 to 0.910.

Further, correlations between the TALS-SR symptomatologic domains and the IES-R total and single domains' scores were all significant, as shown by Pearson's correlation coefficient showing a good correlation for overall scores of these two instruments. Specifically, the TALS-SR symptomatologic domains revealed to be significantly and positively correlated with both the three IES-R domains and the total scores, with the only exception for domain VII (Maladaptive coping) that presented the lowest associations with the three IES-R scale domains, ranging from 0.397 to 0.402. Such result is not surprising, in light of the fact that maladaptive symptoms assessed by TALS-SR represent a symptomatologic dimension of PTSD not investigated by the IES-R scale, which takes into account former PTSD symptom criteria.[32] Maladaptive behaviours represent, in fact, an important novelty among diagnostic criteria for PTSD in the DSM-5.[1]

We also draw attention to the observation that TALS-SR questionnaire demonstrated to well discriminate between subjects with and without PTSD, as shown by comparisons on TALS-SR total and single domain scores between the PTSD and No-PTSD groups. Particularly, subjects with PTSD showed significantly higher mean scores with respect to those without in each domain of the TALS-SR, significant for all the symptomatologic domains, as expected. Such evidence supports the validity of this instrument as a measure of post-traumatic stress symptoms both in its subthreshold atypical and the full-blown forms of the Disorder, as characterized by the diagnostic criteria of the DSM-5. On the other hand, the finding of significantly higher mean scores in the PTSD group with regard to the No-PTSD group in each domain of the TALS-SR, including the Domains III (Potentially Traumatic Events) and IX (Personal Characteristics-Risk factors) strengthens the evidence that this spectrum instrument investigates not only the spectrum of trauma and loss-related symptoms but also the exposure to a series of potentially traumatic and/or loss events to which a subject may have been exposed, as well as personological features, which may represent clinical features and/or risk factors of a post-traumatic stress syndrome.

Finally, we also analysed the levels of work and social functioning impairment between HCWs with and without PTSD, finding that subjects in the PTSD group showed significantly higher mean scores in all the WSAS items regarding subjects without PTSD. Much evidence already highlighted that disability related to post-traumatic stress symptomatology is generally associated with various aspects of functional impairments in areas of daily life, including intimate relationships, friendships and socializing, parenting, as well as work and academic performance[33,34] and associations between PTSD and objective indicators of quality of life (QOL) were observed. Some evidence also pointed out the burden of functional impairment associated with Post-Traumatic Stress dimensions among HCWs.[20,35,36] Previous viral outbreaks showed HCWs at increased risk of psychological adverse effects[36–39] during and after the epidemics and, also in the framework of COVID-19 outbreak, HCWs were shown to be at increased risk of negative mental health outcomes, among which PTSD.[40–46] Our finding supports the evidence of previous studies revealing higher levels of functioning impairment among individuals with post-traumatic stress symptoms with respect to those without, with these latter found as predictive factors of impairment in each domain of functioning analyzed in a sample of HCWs facing the COVID-19 pandemic.[35]

The present study has some limitations to note. First, although the positive feedback from participants about the fact that the questionnaire focuses on many features of post-traumatic stress spectrum symptoms related to their work duties during the COVID-19 emergency, the effective length of the questionnaire must be taken into account. The second limitation is the relatively small sample size, despite it is important to notice that all HCWs were on duty and assessed in the framework of a clinical contact. Third, the use of a self-report instrument instead of a clinical interview to assess PTSD may affect the results of the present study.

Conclusions

Despite the limitations, this study has several important strengths. We believe that the validation of a Spectrum instrument for Trauma and Loss Spectrum symptoms in Spanish language may be a useful opportunity for clinicians to provide a broader and dimensional description of the clinical features of the patients in the everyday practice. The TALS-SR questionnaire, since its validation, was in fact adopted in clinical samples, such as patients with PTSD, caregivers of children with chronic illnesses, Emergency unit personnel, as well as in general population samples.[8,20,35,47,48] This approach allows also to assess partial symptomatologic PTSD, demonstrated to be clinically relevant as well as full-blown presentations of the disease. Overall, this wider dimensional approach may influence the possible assessment, preventive and treatment strategies for individuals affected. Moreover, we suggest that the self-report format might give substantial advantages in terms of economy, as well as eliminating the need for rater training, reducing the risk of observer bias both if the instrument is used in a screening process or as an outcome measure of treatments.

Data Sharing Statement

Datasets are available upon reasonable request to authors.

Ethics Approval and Informed Consent

The study was conducted in accordance with the Declaration of Helsinki and the Ethics Committee of the University of Murcia approved all recruitment and assessment procedures (Murcia, Spain, protocol study ID: 3448/2021). Informed consent was obtained from all subjects involved in the study.

Acknowledgment

We are grateful to all the participants of this study for their significant contribution.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

This research received no external funding.

Disclosure

The authors declare no conflicts of interest in this work.

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