The Psychologist:
Practice & Research Journal

ORDEM DOS PSICÓLOGOS

Assessing functional impairment in university students seeking psychological help: a psychometric study of the Portuguese Work and Social Adjustment Scale

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Received:
28 January 2023

Last revised:
10 April 2024

Accepted:
29 April 2024

Abstract

Background: It has been advocated that higher education settings should promote a supportive environment devoted to improving several dimensions of the well-being of their communities. Assessing functional impairment is of utmost importance, particularly in clinical services.
Goals: The present study aimed at analyzing factor structure and psychometric properties of the Work and Social Adjustment Scale (WSAS), a 5-item scale developed to assess the patient's perceived functional impairment resulting from a health problem in five dimensions: work, social leisure activities, private leisure activities, and relationships with others.
Methods: A non-probabilistic sample of university students who sought mental health support answered a set of self-report questionnaires, including the WSAS and measures of anxiety, depression, and quality of life.
Results: Overall, 207 university students participated in the study (22 years old of mean age; 74,9% female and 69,2% undergraduate). Confirmatory factor analysis indicated an adequate fit to the single-factor structure, and the scale presented very good reliability. Concurrent, convergent, and incremental validity were also found, and the WSAS differentiated groups with different levels of anxiety and depressive symptoms.
Discussion: Overall, our results corroborate that WSAS is a brief, reliable, and valid measure, and, therefore, useful in research and clinical settings. Further research is needed, particularly regarding temporal stability, discriminative power between clinical and non-clinical populations, and clinical samples between different diagnoses.

Keywords: Psychosocial adjustment; Psychometric properties; Factor analysis; University community.

Background

Young adults, especially university students, are at greater risk for developing psychological disorders, given the presence of a set of vulnerabilities and challenges in their transition to higher education (Sheldon et al., 2021). There is also a substantial increase in the severity of cases of higher education students with psychological problems (Lipson et al., 2019). Universities have a fundamental role in the development of policies and practices that promote the health and well-being of students, as well as in the identification, prevention, and treatment of Mental Health problems (Reavley & Jorm, 2010). Most recent psychotherapeutic approaches have been transitioning from a symptom-based approach to person-based approaches focused on subjective aspects of recovery, functionality, and well-being (Leamy et al., 2011). Therefore, this shift to an approach more focused on function and perceived ability to live a meaningful life led to new targets in psychological assessment, such as perceived impairment in functionality.

The Work and Social Adjustment Scale (WSAS hereinafter) was developed to assess the patient's perceived functional impairment resulting from a health problem in five dimensions: work, social leisure activities, private leisure activities, and relationships with others. WSAS has been widely used worldwide and, specifically in services aimed at improving access to psychological therapies (WSAS is mandatory in the British initiative Improving Access to Psychological Therapies treatment model and in its Norwegian adaptation, Prompt Mental Health Care (Lervik et al., 2020). These services aim to improve access to evidence-based psychological care for adults with psychological disorders of mild to moderate severity and have focused on assessing functionality and quality of life in addition to psychopathology symptoms. Several clinical trials have been using the WSAS (e.g., Richards et al., 2020; Seekles et al., 2011), and the WSAS has even been proposed and studied as a Patient Reported Outcome Measure (PROM) (Zahra et al., 2014), which highlights its clinical utility, both in assessing patients and services.

Psychometric studies have shown WSAS' reliability, validity, temporal stability and sensitivity to change in several different samples, both with physical health (e.g. Cella et al., 2011; Thandi et al., 2017) and mental health conditions, such as depression, obsessive-compulsive disorder (Mundt et al., 2002), phobias (Mataix-Cols et al., 2005), bipolar disorder (Echezarraga et al., 2018), and personality disorders (Pedersen et al, 2017).

Psychometric properties have also been studied and found adequate in treatment-seeking samples (e.g. Tolchard, 2016). The WSAS unidimensional structure has been studied in the previously mentioned individual studies with specific samples. Additionally, Thandi and collaborators (2017) confirmed the unifactorial structure across different samples. On the other hand, some studies warn of validity issues, namely differential item functioning regarding gender and health condition (Thandi et al., 2017) and only partial measurement invariance across gender (Pedersen et al., 2017).

The present study sought to investigate WSAS factor structure and psychometric properties, namely internal consistency, construct validity, incremental validity, and sensitivity, in a Portuguese sample of help-seeking university students. We aimed to confirm the WSAS unifactorial structure and to corroborate the adequate psychometric properties found in previous studies. We also hypothesized that the WSAS would present moderate to strong associations with measures of anxiety (Generalized Anxiety Disorder scale-7), depression (Patient Health Questionaire-9), and quality-of-life (WHO Quality of Life – BREF) (negative associations with the last construct). Still regarding measures of anxiety and depression, we aimed to test the WSAS incremental validity by analysing its added value in explaining quality-of-life beyond psychopathological symptoms. Furthermore, we expect WSAS to differentiate participants with different levels of anxiety and depression, as measured by the PHQ-9 and GAD-7.

Methods

Design

The present study followed a retrospective, observational design. A series of analyses were completed using data from a clinical psychology appointment dataset, collected at a Portuguese healthcare unit. The clinical psychology intervention consists of two assessment sessions and further cognitive-behavioral psychotherapy sessions in individual and/or group formats.

Sampling

This study is part of a larger project, "implementing a stepped care model in providing mental health care for a university community". The sample was part of the clinical dataset from the University of Coimbra Health Services' psychology appointment. The sampling process for this study followed a non-probabilistic approach. Recruitment was conducted through direct invitation during the clinical psychology appointments. All students who attended clinical psychology appointments from May 2019 to June 2021

and who consented to participate in the study by filling out the assessment protocol were included in the study. Participants filled in the battery of questionnaires as part of the first clinical psychology assessment session. Exclusion criteria included: not having Portuguese nationality.

Measures

In this study, the Patient Health Questionnaire-9 (PHQ-9), the Generalized Anxiety Disorder 7-item (GAD-7) scale, and the World Health Organization Quality of Life Assessment Brief Version (WHOQOL-BREF) were utilized as part of the assessment battery. These instruments have been previously validated for use in the target population. However, it's important to note that the Work and Social Adjustment Scale (WSAS) underwent a translation and cultural adaptation process before its use in this study. This process ensured linguistic and cultural equivalence with the original version, allowing for its appropriate application in the study population.

The instruments were administered via self-report during the first clinical psychology assessment session. Participants were given the option to complete the assessments using paper-and-pencil forms. The order of presentation of the instruments was standardized across all participants, starting with the PHQ-9, followed by the GAD-7, the WSAS, and concluding with the WHOQOL-BREF

Work and Social Adjustment Scale (WSAS; Marks, 1986)

The WSAS is a five-item self-report scale, designed to assess functional impairment due to a specific problem identified by the patient. It measures impairment regarding different aspects: work/study, home management, social leisure activities, private leisure activities and relationships with others. Lower scores indicate better adjustment (each item being rated in a scale from 0 [not at all] to 8 [severely impaired], thus with scores ranging between 0 and 40) with three cut-of points being suggested: a) subclinical populations scoring bellow 10; b) people with significant functional impairment but moderate clinical symptoms scoring between 10 and 20; and c) people with severe psychopathology presenting scores above 20 (Mundt et al., 2002). The original version presented good psychometric properties, with high internal consistency (α = .70 to .93), temporal stability (r = .73), and correlations above .80 with clinical interviews (Mundt et al., 2002). The present study aims to study the psychometric properties and factor structure of the Portuguese version.

Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001)

The PHQ-9 is the depression module of a diagnostic instrument for common mental health disorders (the PRIME-MD) and assesses (through self-report) nine DSM-IV criteria (e.g. “little interest or pleasure in doing things”, “feeling down, depressed or hopeless”, “thoughts that you would be better off dead, or thoughts of hurting yourself in some way”) in a four-point Likert scale (‘not at all’ to ‘nearly every day’). The original version presented excellent internal consistency (.89) and test-retest reliability, high levels of sensitivity (88%) and specificity (88%) for major depression, and significant associations with measures of quality of life, psychopathology, and symptom-related impairment (Kroenke et al., 2001). The Portuguese version has been studied in clinical samples and non-clinical samples, also with good internal consistency, convergent, divergent, and criterion validity, and temporal stability (Ferreira et al., 2018; Torres et al., 2016). A study with two clinical samples found two alternative three-factor solutions (Ferreira et al., 2018), and in college students, a three-factor solution (with a second-order factor) was also found (somatic, cognitive and affective) (Monteiro et al., 2019). In the present study, the Cronbach’s alpha was .82.

Generalized Anxiety Disorder scale (GAD-7; Spitzer et al., 2006)

GAD-7 is a seven-item self-report measure, assessing DSM-IV-TR criteria for generalized anxiety disorder (e.g. “feeling nervous, anxious, or on edge”, “trouble relaxing”, “feeling afraid as if something awful might happen”) in a four-point Likert scale (“not at all” to

"nearly every day"). It is usually used as a screening tool and severity measure. The original version was unidimensional and presented good reliability, criterion, construct, factorial, and procedural validity, and good agreement between self-report and interviewer-administered versions (Spitzer et al., 2006). The Portuguese version, also found to be unifactorial in a sample of patients with generalized anxiety disorder, was considered feasible (mean completion time under 3 minutes) and presented excellent internal consistency and very good temporal stability (Sousa et al., 2015). In the present study, Cronbach's alpha was .86.

World Health Organization Quality of Life scale-BREF (Skevington et al., 2004)

WHOQOL-BREF is a 26-item scale designed to measure quality of life in a multidimensional way. It encompasses four quality-of-life domains: physical health, psychological health, social relationships, and environmental health, as well as a global indicator. WHOQOL-BREF has been shown to have good to excellent psychometric properties, such as reliability and (construct, discriminant) validity, in clinical and non-clinical samples across several countries (Skevington et al., 2004). In the Portuguese version, the instrument revealed good psychometric properties, namely internal consistency (alphas ranging from .64 to .92), temporal stability (no significant differences between assessment moments), discriminant and construct validity, in clinical and non-clinical samples (Vaz-Serra et al., 2006). In the present study, the Cronbach's alphas for the WHOQOL dimensions were: .72 (physical), .80 (psychological), .59 (social relationships), and .77 (environmental health).

Statistical analysis

Preliminary data analyses were executed to examine the adequacy of the data using IBM SPSS Statistics 25 and MVN: an R package for assessing multivariate normality software (Korkmaz et al., 2014). Univariate and multivariate skewness and kurtosis values (Hair et al, 2010) were verified to examine if there was a bias to normal distribution.

Data were missing for less than 1% of the cases for the WSAS. To retain the full sample for analysis, an expectation-maximization analysis was used to determine that the data were missing completely at random. Missing values were then replaced by imputed values and saved into a new data file for further analysis. To confirm that the original factor structure would have an adequate fit to our data, confirmatory factor analysis was conducted using MPLUS software Version 6.12 (Muthén & Muthén, 1998-2012), using maximum likelihood robust as the estimator.

To assess model fit we first used the chi-square goodness-of-fit. A nonsignificant chi-square is desired as it suggests that the reproduced and observed covariance matrices do not differ, and hence the data fit the proposed model structure. As recommended, we also used other global fit indices: Tucker–Lewis index (TLI); Comparative Fit index (CFI); Standardised Root Mean Residual (SRMR); and Root Mean Square Error of Approximation (RMSEA). Model fit was considered adequate using the cut-offs suggested by Hair et al. (1998): RMSEA<.07; CFI>.90; TLI>.90; SRMR<.08. Regarding local adjustment, all standardized factor loadings (λ) and individual reliability (R^2) should present statistical significance ($p < .05$) (Schumacker & Lomax, 2010).

Descriptive statistics, reliability analysis and inferential analysis were computed using IBM SPSS Statistics for Windows, Version 20. Means (and standard deviations), item statistics (inter-item correlations, item-total correlations) were computed to understand the scale's variability and item adequacy (if items were related between each other and related to the total score within the correspondent factor). Cronbach's coefficient alpha was used to assess internal consistency. These reliability results were evaluated using Nunnally's criteria (1978), with alphas >.7 considered acceptable. Pearson correlation coefficients were calculated to assess concurrent and convergent validities. Correlations between .30 and .50 are considered low, between .50 and .70 moderate and above .70 high (Tabachnick, & Fidell, 2007).

A one-way independent ANOVA was performed to compare mean WSAS scores between groups with different levels of anxiety and depression (groups were created considering the cut-off points of PHQ-9 and GAD-7). The homogeneity assumption was tested using Levene's test. The post hoc Tukey HSD procedure was performed because it is considered the most powerful test for controlling Type I errors (Field, 2013).

Ethical issues

The project was approved by the ethics committee of the Faculty of Medicine of the University of Coimbra (CE-106/2020).

Results

Participants

Overall, 207 students participated in the study. Participants' age ranged from 17 to 49 years old (M = 22.82; *SD* = 4.29). Most participants were female (74.9%) and all students: 69.2% undergraduate students, 25.7% master students, and 5.1% PhD students.

Preliminary data analysis

Mardia's multivariate skewness and kurtosis test (Husted et al., 2000) showed that the WSAS was not multivariate normal (multivariate skewness = 71.80, $p < .001$ and multivariate kurtosis = -1.08, $p = .28$). Thus, the CFA was conducted using the MLR estimator.

Table 1. *Means (M), standard deviations (SD), corrected item-total correlations, item loading from CFA, Cronbach's alpha and Cronbach's alpha if item deleted for WSAS (N=207)*

Items	*M*	*SD*	Corrected item-total *r*	Cronbach's alpha (Cronbach's alpha if item deleted)	Item loadings from CFA
1. Because of my [problem] my ability to work is impaired.	4.92	1.87	.59	(.77)	.67
2. Because of my [problem] my home management (cleaning, tidying, shopping, cooking, looking after home or children, paying bills) is impaired	3.14	2.27	.51	(.79)	.57
3. Because of my [problem] my social leisure activities (with other people e.g. parties, bars, clubs, outings, visits, dating, home entertaining) are impaired.	4.22	2.27	.54	(.78)	.62
4. Because of my [problem], my private leisure activities (done alone, such as reading, gardening, collecting, sewing, walking alone) are impaired.	3.87	2.37	.68	(.73)	.80
5. Because of my [problem], my ability to form and maintain close relationships with others, including those I live with, is impaired.	3.94	2.26	.63	(.75)	.72
WSAS total score	**20.10**	**8.30**		**.80**	

The table presents data from the Work and Social Adjustment Scale (WSAS), where participants select a specific problem affecting their ability to engage in work/study, home management, social leisure activities, private leisure activities, or relationships with others.

Confirmatory factor analysis

A unifactorial structure of WSAS was tested according to the original exploratory factor analysis. This model showed an acceptable fit to the data: MLR χ^2 (5) = 10.575, p = .06, χ^2 / df = 2.11, CFI = 0.979, TLI = 0.958, RMSEA = 0.073, p = .220, 90% C.I. = 0.000 - 0.136, SRMR = 0.031. Regarding local adjustment, as can be seen in Table 1, all standardized factor loadings were statistically significant (≤ .001), ranging from .57 (item 2) to .80 (item 4), and squared multiple correlations ranged from .33 (item 2) to .64 (item 4).

Descriptive Statistics and Reliability Analysis

Means, standard deviations, corrected item-total correlation, Cronbach's alpha if the item is deleted, and Cronbach's alpha for WSAS total score are also displayed in Table 1. WSAS presented good internal reliability (α =.80). As can be seen in Table 1, item-total correlations were above .40, ranging from .51 (item 2) to .68 (item 4). Therefore, all items significantly contributed to the instrument's internal consistency.

Validity study

Six participants did not answer the WHOQOL-BREF. Therefore, the analyses in this section were performed with 201 participants. Table 2 displays Pearson's correlation coefficients for all studied variables. As expected, WSAS revealed positive and moderate associations with anxiety and depression measures. Additionally, it presented moderate negative associations with quality-of-life domains.

Table 2. *Intercorrelation scores between studied variables*

Measures	1	2	3	4	5	6
1. WSAS	-					
2. PHQ-9	.66***	-				
3. GAD-7	.53***	.72***	-			
4. WHOQOL-BREF Physical health	-.64***	-.72***	-.53***	-		
5. WHOQOL-BREF Psychological health	-.63***	-.74***	-.54***	.64***	-	
6. WHOQOL-BREF Social relationships	-.47***	-.36***	-.27**	.37***	.54***	-
7. WHOQOL-BREF Environmental heath	-.39***	-.49***	-.42***	.56***	.47***	.41***

*** *p* <.001

WSAS = Work and Social Adjustment Scale; PHQ-9 = Patient health Questionaire; GAD-7 = Generalized Anxiety Disorder scale; WHOQOL-BREF = WHO Quality-of-Life scale-BREF

Incremental validity was tested, and it was found that the WSAS scores added a significant contribution to quality of life after the contribution of anxiety and depression (ΔR^2 = .027, $\Delta F_{(1,196)}$ = 12.187, p = .001, n = 200). The final model was significant (R^2 = .57, $F_{(3,196)}$ = 86.119, p < .001), with only depression (β = -.58, p < .001) and the WSAS (β = -.23, p = .001) significantly predicting quality of life (anxiety was no longer significant, β = .00, p = .999).

Sensitivity

Results showed significant differences in WSAS scores between groups with different levels of depression and anxiety (Tables 3 and 4). According to Cohen's (1988) recommendations, these significant differences had large effect sizes. Post hoc comparisons using the Tukey HSD test indicated that all groups differed in the expected direction (increasing levels of

Table 3. *Means, Standard Deviations, and One-Way Analyses of Variance of WSAS score between groups with different levels of depression (PHQ-9)*

	Minimal level of depression (PHQ-9)		**Mild level of depression (PHQ-9)**		**Moderate level of depression (PHQ-9)**		**Severe level of depression (PHQ-9)**		$F_{(3, 203)}$	η^2
WSAS (score)	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	44.06^{***}	.47
	9.71	7.32	14.66	6.82	19.85	6.08	24.38	5.39		

$^{***}p < .001$

Table 4. *Means, Standard Deviations, and One-Way Analyses of Variance of WSAS score between groups with different levels of anxiety (GAD-7)*

	Minimal level of anxiety (GAD-7)		**Mild level of anxiety** (GAD-7)		**Moderate level of anxiety (**GAD-7)		**Severe level of anxiety** (GAD-7)		$F_{(3, 203)}$	η^2
WSAS (score)	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	32.41^{***}	.32
	8.29	5.53	16.52	7.42	20.42	7.49	25.30	5.97		

$^{***}p < .001$

anxiety or depression presented increasing scores on the WSAS, except for the groups with mild and moderate anxiety, which did not differ).

Discussion

The Work and Social Adjustment Scale has been widely used as a self-report measure of functional impairment across five life domains (work/study, home management, social leisure activities, private leisure activities, and relationships with others). Due to the scale's simplicity and brief nature, WSAS has been widely used in research and clinical settings, particularly in services aimed at improving access to psychological therapies and prompt mental health care (Lervik et al., 2020). There was no previous reporting of WSAS psychometric properties with Portuguese samples. Therefore, the present study sought to confirm the WSAS unidimensional factor structure and explore the scale's psychometric properties in a Portuguese sample of help-seeking university students. Moreover, to our knowledge, there were no previous WSAS psychometric studies with university students. Assessing functional impairment is of utmost importance in young adults seeking mental health services to evaluate the efficacy of interventions in non-symptom-related aspects.

The confirmatory factor analysis confirmed the unifactorial structure, with adequate model fit, which goes in line with the original dimensionality, as found by Mundt et al. (2002), as well as in other studies conducted with different samples (Thandi et al., 2017). The only fit index without acceptable values was RMSEA. According to Kenny et al. (2015), a falsely high RMSEA could be obtained for models with small degrees of freedom and a small sample size. Given this, we suggest testing the multidimensionality of the scale using a larger sample size. The scale presented very good internal consistency, further corroborating the adequacy of using the WSAS items to measure an overall indicator of psychosocial functioning impairment.

The results from the correlational study highlighted WSAS concurrent and convergent validity, with higher levels of functioning impairment being positively associated with higher levels of psychopathology, both anxiety and depression; and negatively associated with quality-of-life domains. Other studies with different samples have previously stated WSAS validity (Echezarraga et al., 2018; Jassi et al., 2020; Mataix-Cols et al., 2005; Zahra et al., 2014), also including measures of quality of life. Other studies (Zahra et al., 2014), including Portuguese samples (Ferreira et al.,

2018), also found this pattern of associations. Although one study found that the WSAS measures a distinct social functioning component when compared to PHQ-9 and GAD-7 (Zahra et al., 2014), future studies should further corroborate the unique contribution of the WSAS in addition to psychopathology measures. Evidence for incremental validity was also found, with WSAS providing a significant contribution to the explanation of quality of life beyond the contribution of anxiety and depressive symptoms. This corroborates the utility of a functioning measure in addition to assessing psychopathological symptoms.

Regarding WSAS sensitivity, the scores differentiated groups with different levels of anxiety and depressive symptoms. Only one exception was found: WSAS scores did not differentiate people with mild or moderate anxiety. We hypothesize that this lack of differentiation may be attributed to the specific characteristics of our sample, predominantly university students. In university populations, severe anxiety often has a major impact on social and academic domains, leading to significant functional impairment. However, mild to moderate anxiety levels, while still present, may not result in significantly different levels of functional impairment compared to those with minimal anxiety. This is because individuals with mild or moderate anxiety may still manage to maintain their daily routines and academic responsibilities to some extent despite experiencing interference in certain areas. Nevertheless, our results highlight the high WSAS sensitivity to differentiate people with different levels of psychopathological symptoms, a key characteristic for a screening and/or initial assessment instrument in clinical settings.

Although our results highlight the WSAS as a simple, reliable, and valid measure of self-reported functional impairment, there are some limitations to the present study that should be considered and tackled in future studies. A major limitation of this study is its cross-sectional design, which does not allow for further conclusions, namely in temporal stability (test-retest reliability) and sensitivity to treatment. Future longitudinal studies are thus warranted. We also need more information about criterion validity. Since the present study's sample was relatively small and heterogeneous, we were not able to compare the factorial structure in specific subgroups (e.g., different diagnosis, population with and without psychopathology) through more complex and robust analysis (e.g., multigroup analysis testing for factor structure invariance). Another limitation is the absence of information on specific diagnoses. We also did not have a non-clinical, non-help-seeking sample of healthy controls with which to compare our results. Therefore, although we did explore WSAS sensitivity, we could not analyze the scale's discriminative power between clinical and nonclinical populations. Regarding the use of previously established cut-off scores to perform categories, it is essential to note that they were proposed for different populations (e.g., adult patients with depression and obsessive-compulsive disorder). Also, for this specific population, we consider that particular instructions regarding the 'ability to work' item might be helpful for students to understand that this item intends to measure the perceived impairment in academic activities.

Conclusions

Overall, the results suggest that the WSAS is a reliable and valid measure to assess functioning disability and can be a valuable tool in clinical and research settings. This is an important contribution to Portuguese clinical services, particularly those implementing stepped-care approaches with the aim of improving access to psychological therapies. This measure allows for assessing symptoms' impact on several life domains, and its administration at different time points of the intervention may also contribute to evaluating the services' efficacy. This study also adds to the literature on the psychometric properties of the WSAS, mainly highlighting its adequacy with help-seeking university students.

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