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Validation of a Single-Item Screening Measure of Burnout in a Sample of Spanish Health Workers

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Abstract: Burnout is a significant problem faced by professionals in the healthcare setting, and yet there is a lack of validated screening tools in the Spanish context. The present study examined the psychometric properties of a single-item measure of burnout (SIB) within a sample of 675 health professionals working at five centres in Spain, with the brief burnout questionnaire (BBQ) providing the main comparison measure. Predictive validity was acceptable, with high positive correlations between SIB, overall BBQ and the three BBQ dimensions. Construct validity, examined using confirmatory factor analysis, found that the SIB sufficiently covered the components of the three factors of burnout described by the BBQ and the components of the three dimensions of the burnout syndrome factor. Convergent validity was confirmed through significant negative correlations between SIB and good perceived health and job satisfaction. Acceptable cut-points were established. The Spanish-language SIB provides an acceptable and sensitive screening measure of burnout for use with health professionals.

Keywords: burnout; healthcare worker; screening tools



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1. Introduction

In January 2022, the updated International Classification of Diseases (ICD-11) developed by the World Health Organization (WHO) came into effect, including burnout syndrome in the list of recognised diseases. This syndrome is conceptualised as “the result of chronic workplace stress that has not been effectively managed”.

Professional burnout is a major global health concern among physicians, nurses, and other healthcare providers (Sultana et al. 2020; Woo et al. 2020; Rotenstein et al. 2018). Professionals working in the healthcare setting are exposed to a high number of stressful situations at work (Arias-Ulloa et al. 2023; Rollin et al. 2022; Søvold et al. 2021; Weinberg and Creed 2000), meaning it is unsurprising that they show high amounts of psychological distress (Hardy et al. 1997) and, consequently, burnout (Wu et al. 2021; Imo 2017; Woo et al. 2020; Patel et al. 2018). In addition, the health crisis provoked by the COVID-19 pandemic has placed further pressure on healthcare providers. Aspects such as work interfering with household activities, feeling pushed beyond training, exposure to COVID-19 patients and making life-prioritising decisions could be leading to even greater burnout within this group of professionals (Leo et al. 2021; Morgantini et al. 2020).

Prior research shows that burnout leads to poor health outcomes in health workers, both directly and via work-related stress (Khamisa et al. 2013). Further, in addition to the personal cost of poor health to health professionals, burnout has a negative impact on the productivity of health professionals, career engagement and quality of patient care

(Hodkinson et al. 2022). This may lead to more professionals walking away from the profession ahead of time (Dewa et al. 2014), with the concomitant cost of this suffered by health services.

Research into burnout among professionals working in the health sector has raised awareness of the importance of health and mental wellbeing among these workers. In this sense, a call has been made for all healthcare systems to evaluate and measure mental health and, specifically, levels of burnout in the health sector (Rotenstein et al. 2018). To this end, validated instruments are needed that can be used routinely (Stodolska et al. 2023) and permit early and continued evaluations. Given the serious consequences of burnout, it is of particular interest to have easy-to-use screening measures available, as this would make it possible to target the working population as a whole and enable early detection of the syndrome.

All of the above makes it critically important for occupational health services to be able to measure and evaluate burnout. Burnout is typically measured according to three established dimensions, namely, emotional exhaustion, depersonalisation, and loss of professional efficacy (Maslach et al. 2001). A number of instruments have been developed to measure burnout, including the Oldenburg Burnout Inventory (Demerouti et al. 2003), the Copenhagen Burnout Inventory (Kristensen et al. 2005), the Brief Burnout Questionnaire (BBQ; Moreno Jiménez et al. 1997) and the Maslach Burnout Inventory (MBI; Maslach et al. 1996). Until recently, the most commonly used instrument to measure burnout both internationally and within Spain was the MBI; however, the validated Spanish adaption has since been discontinued. This has left a gap that must be filled through validation studies in order to verify the appropriate use of burnout measures by Spanish health professionals.

Further, given the pressures and shortage of both time and human resources already imposed on health services, it is important for single-item instruments to be available that can be completed quickly and screen for the risk of burnout. One such single-item measure was developed by Schmoldt et al. (1994) and later validated by Rohland et al. (2004) in a sample of Texas Tech University School of Medicine students. However, while this tool has been validated in different populations in the United States (Dolan et al. 2014; Knox et al. 2018; Waddimba et al. 2016; West et al. 2009, 2012; Flickinger et al. 2020; Kemper et al. 2019), Australia (Hansen and Girgis 2010) and Singapore (Ong et al. 2021), no single-item burnout measure has been validated within a sample of Spanish-speaking health workers from Spain. Thus, the present study aimed to validate the aforementioned single-item burnout measure within a population of Spanish health workers and describe its psychometric properties for use in this population.

2. Materials and Methods

The study methodology followed two main phases. The first phase corresponded to the adaptation of the single-item screening measure to be tested and administered as part of a questionnaire. A review of existing literature was conducted with the aim of identifying scales employed in Spain to evaluate burnout. Outcomes of the literature review pertaining to candidate scales were tabulated and classified according to the number of items included in the scale under consideration, with scales being grouped according to those made up of 1, 2, 3 and >3 items. The table included information about each questionnaire, including its psychometric questionnaires and the population with which it had been validated.

Once eligible scales had been compiled, members of the research team and experts in the fields of health sciences and social sciences reviewed the psychometric properties inherent to the scales while also considering the samples with which they had been evaluated. For scale selection, a deductive method called logic partitioning was used alongside content analysis. Logic partitioning followed an iterative process of, firstly, identifying all potential candidates for use as the single-item measure, followed by selection based on characteristics such as relevance to context, viability and empirical basis.

Following the aforementioned process, members of the expert panel each selected three scales, one comprising a single item, a short scale (between 1 and 3 items) and a

multidimensional scale (more than 3 items). Selected scales were examined in the second stage of the study. Scales were agreed upon through discussion, debate and consensus. The single-item selected was the single-item measure developed by [Schmoldt et al. \(1994\)](#). This version of the SBI was then submitted to a process of transcultural adaptation that consisted of direct translation, translation synthesis, inverse translation and consolidation via an expert panel.

The second part corresponded to participant recruitment and questionnaire administration. Health professionals were recruited via convenience sampling from five health centres in Spain. The questionnaire was sent via mass mailing to corporate email, including a LimeSurvey link to the digital version, and/or in paper format by research team members based at participating centres in June 2021, with a reminder being sent out 10 days later. The first page of the questionnaire requested informed consent, with participants only being able to proceed upon an affirmative response.

2.1. Instruments

Single-item burnout measure (SIB; [Schmoldt et al. 1994](#)). Response options range from: (1) I enjoy my work. I have no symptoms of burnout; to (5) I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help. The original validation study ([Rohland et al. 2004](#)) found this item to be conceptually similar to and highly correlated with the MBI.

Brief burnout questionnaire (BBQ; [Moreno Jiménez et al. 1997](#)). It comprised 21 items rated along a 5-point scale, of which 9 describe antecedents of burnout, 9 describe the syndrome itself and 3 describe consequences of burnout. This tool was selected as a comparison for the single-item measure due to its wide adaptation into Spanish, including in the health context ([García-Carmona and Robles-Ortega 2011](#)). Further, factor 2 of this tool, denominated 'burnout syndrome', comprises the dimensions of emotional exhaustion, lack of personal realisation and depersonalisation, which are the same dimensions evaluated by the MBI. Scores can be summed to give an overall score for quantitative comparison, or factor scores can be summed to give overall factor scores for which established cut-points exist. The burnout syndrome factor was most consistently related to overall burnout, so it was used for classification in the present study. Burnout was diagnosed by scores of 27 and above for this factor.

Job satisfaction questionnaire S20/23. It comprises 23 items designed to evaluate satisfaction pertaining to the occupational setting. Internal consistency of the scale was reported as 0.92 in its original validation ([Meliá and Peiró 1989](#)).

Perceived health (adapted from [Ware and Sherbourne 1992](#)). Participants responded to the statement, "How would you say your health is in general?" along a 5-point scale ranging from (1) excellent to (5) poor. This item has been widely used throughout Spain and more globally ([Jürges et al. 2008](#)).

Sociodemographic variables. The questionnaire also included ad hoc items on sex, date of birth, number of years working in their profession, number of years working at the centre, professional category and paid weekly working hours.

Data were collected and stored digitally within the Lime Survey software (Community Edition version 3.28.74, Open source community, Australia) or on paper at participating centres and unified in a digital database upon the termination of data collection. All data were coded to protect anonymity. The statistical programs SPSS v26.0 (versión 26.0, IBM, Chicago, IL, USA) and AMOS (versión 26.0, IBM, Chicago, IL, USA) were used for data analysis.

2.2. Statistical Analysis

Construct validity was examined, via confirmatory factor analysis (CFA), through the independent estimation of the relationship between SIB and, firstly, the three factors of the BBQ and, secondly, the three dimensions of the burnout syndrome dimension of the BBQ, as proposed by [Moreno Jiménez et al. \(1997\)](#). Factor loadings > 0.4 were considered acceptable.

The effect of incorporating the SIB into the BBQ model on model fit was estimated via chi-squared Yuan and Butler estimations with bootstrapped standard errors (CFI > 0.95, RMSEA 0.05–0.08 and SRMR 0.08 considered acceptable).

Predictive validity was examined through Pearson correlations between the values produced for the SIB and the burnout syndrome factor of the BBQ. Convergent validity was examined through Pearson correlations of SIB with job satisfaction and general health.

Finally, sensitivity and specificity were examined for two different previously established cut-points for SIB, via regression analysis, to examine the degree of association of burnout with poor health and job dissatisfaction. An inclusive cut-point for diagnosing burnout cases as scores of 3 to 5 was compared to a strict cut-point for diagnosing cases only as scores of 5. For this, regression analysis was carried out, classifying burnout cases according to diagnosis using BBQ factor 2, with resultant odds ratios also being considered.

3. Results

A final sample of 675 health professionals was recruited for the present study. Of these, 71.6% were female and 28.4% were male. A total of 15.6% were working in primary care, and 84.4% worked in a hospital. Further, 29.8% occupied non-health roles (e.g., administrative, menial, etc.) compared to 70.2% in health roles. Specifically, 28% were doctors, 33% were nursing staff, 16% were nursing support staff, 11% were administrative staff, 6% were porters and 6% were employed in another type of role (general services, maintenance, etc.). Finally, 23.2% did not have direct contact with the public, whereas 76.8% reported that they did. Using SIB, 31.1% and 6.2% had burnout using ‘inclusive’ and ‘strict’ cut-points, respectively. Using factor 2 of the BBQ, 32.3% presented burnout.

Tables 1 and 2 present the outcomes of the CFA performed to examine construct validity.

Table 1. Confirmatory factor analysis outcomes following incorporation of SIB into the model of the three factors of the BBQ (using the original factor structure proposed by [Moreno Jiménez et al. \(1997\)](#)).

Factor 1 (Antecedents)		Factor 2 (Syndrome)		Factor 3 (Consequences)		
Factor Loadings						
Single-item	0.74	Single-item	0.82	Single-item	0.78	
BBQ-2	0.74	BBQ-1	0.83	BBQ-13	0.75	
BBQ-10	0.42	BBQ-7	0.82	BBQ-17	0.74	
BBQ-16	0.64	BBQ-15	0.86	BBQ-21	0.69	
BBQ-6	0.81	BBQ-3	0.44			
BBQ-14	0.55	BBQ-11	0.48			
BBQ-20	0.73	BBQ-18	0.28			
BBQ-4	0.58	BBQ-5	0.55			
BBQ-8	0.52	BBQ-12	0.70			
BBQ-9	0.59	BBQ-19	0.69			
Fit Indices						
χ^2	255.38	0.000	120.79	0.000	1.97	0.373
CFI	0.823		0.939		1.000	
NFI	0.802		0.916		0.995	
RMSEA	0.144		0.090		0.000	
SRMR	0.082		0.058		0.011	

Table 2. Confirmatory factor analysis outcomes following incorporation of SIB into the model of three dimensions of the syndrome factor of the BBQ (using the original factor structure proposed by Moreno Jiménez et al. (1997)).

Dimension 1 (Emotional Exhaustion)		Dimension 2 (Lack of Personal Realisation)		Dimension 3 (Depersonalisation)		
Factor loadings						
Single-item	0.811	Single-item	0.704	Single-item	0.471	
BBQ-1	0.822	BBQ-5	0.639	BBQ-3	0.663	
BBQ-7	0.828	BBQ-12	0.703	BBQ-11	0.706	
BBQ-15	0.889	BBQ-19	0.739	BBQ-18	0.300	
Fit indices						
χ^2	1.210	0.546	13.167	0.001	7.990	0.018
CFI	1.000		0.984		0.979	
NFI	0.999		0.981		0.973	
RMSEA	0.000		0.079		0.058	

It can be observed from Table 1 that all factor loadings are acceptable apart from those produced in relation to item 18, showing that SIB adequately measures the three factors of burnout proposed by the BBQ. Nonetheless, while model fit is acceptable in the case of factor 3, RMSEA values indicate poor fit for the other two factors. Given the poor performance of item 18, the analysis was repeated, eliminating this item with no notable change in outcomes.

Similarly, as seen in Table 2, factor loadings produced from the incorporation of SIB into the three-dimensional model of the burnout syndrome factor of the BBQ suggest that the tested item appropriately measures these three dimensions, again with the only exception of item 18. In this case, model fit was also acceptable, being especially good in relation to dimensions one and three of burnout syndrome.

With regard to predictive validity, Table 3 presents Pearson correlations between SIB and the overall BBQ, its three factors and the three dimensions of the burnout syndrome of the BBQ.

Table 3. Predictive validity of SIB examined via Pearson correlations with the BBQ.

	Single-Item Measure (SIB)		
	r	p	N
Overall BBQ	0.738	0.000	627
BBQ Factor 1: Factors of burnout	0.638	0.000	629
BBQ Factor 2: Burnout syndrome	0.710	0.000	628
BBQ Factor 3: Consequences of burnout	0.667	0.000	627
Dimensions of factor 2: Burnout syndrome			
Emotional exhaustion	0.766	0.000	628
Lack of personal realisation	0.600	0.000	628
Depersonalisation	0.392	0.000	628

As can be observed in Table 3, statistically significant correlations (all $p < 0.001$) were produced between SIB and all aspects of burnout as measured by the BBQ. This shows that SIB does indeed measure the construct it is intended to measure.

Convergent validity was confirmed through significant negative correlations between SIB and general health ($r = -0.535$; $p = 0.000$) and job satisfaction ($r = -0.575$; $p = 0.000$).

With regard to the examination of the adequacy of formerly established cut-points, results are presented in Table 4.

Table 4. Association between cases of burnout, as diagnosed according to two different SIB cut-points, and poor perceived health and job dissatisfaction.

	Single-Item ('Inclusive' Diagnosis of Burnout [Scores 3, 4 and 5])		Single-Item ('Strict' Diagnosis of Burnout [Score 5])	
	OR	95% CI	OR	95% CI
Perceived poor health	8.54	5.71–12.78	11.75	5.26–26.23
Job dissatisfaction	8.16	5.43–12.24	16.67	5.07–54.84

Perceived poor health and job dissatisfaction were significantly predicted by burnout, regardless of the cut-point used. However, a larger odds ratio was produced in relation to the stricter definition of burnout. Burnout, as measured by SIB, was also positively related to factor 2 of the BBQ, regardless of the cut-point used, although a stronger correlation was seen in relation to the inclusive cut-point ($r = 0.648$; $p = 0.000$ vs. $r = 0.350$; $p = 0.000$). Analysis according to sub-groups defined by sex, age and professional group (presented in Supplementary Material) also showed classifications of burnout to be more similar to those produced when using the BBQ when the 'inclusive' cut-point was used.

Finally, the 'inclusive' cut-point showed a sensitivity of 75% and a specificity of 89%, being adequate and very good, respectively. The 'strict' cut-point had a sensitivity of 19% and a specificity of 99%, being unacceptable and excellent, respectively.

4. Discussion

The present study examined the psychometric properties of a SIB within a sample of 675 health professionals working at five centres in Spain, with the BBQ providing the main comparison measure. Predictive validity was acceptable, with high positive correlations between SIB, overall BBQ and the three BBQ dimensions. Construct validity, examined using confirmatory factor analysis, found that the SIB sufficiently covered the components of the three factors of burnout described by the BBQ and the components of the three dimensions of the burnout syndrome factor. The SIB was revealed to be an adequate diagnostic tool, although dimensional weaknesses prevail.

In their original study with 307 medicine graduates, Rohland et al. (2004) found a significant association between the English-language version of this same single-item measure and the three factors of burnout as measured via the MBI, with the strongest relationship emerging with emotional exhaustion. When administered to workers at an Australian oncology unit, Hansen and Girgis (2010) found the SIB to correlate with the emotional exhaustion factor of the MBI but did not examine its association with any other factor. In 1050 primary care workers in California and 308 doctors in New York, Knox et al. (2018) and Waddimba et al. (2016), respectively, found the SIB to significantly correlate with both the emotional exhaustion and cynicism factors of the MBI, although neither of these authors examined its association with MBI overall scores or with specific dimensions. In contrast, Ong et al. (2021) and Flickinger et al. (2020) found the English-language version of the SIB to correlate with all MBI burnout factors in 439 hospital workers in Singapore and 287 medical students from Virginia, respectively. All of the above provides tentative preliminary support for the potential use of the tool, although in-depth validation is lacking and analysis in the European and, more specifically, Spanish-speaking context is required.

The present study addressed this gap by examining the Spanish version of the SIB but also furthered existing research by expanding consideration to include both a multi-component burnout measure and its various dimensions. The present examination of the multi-dimensionality of this single-item instrument is novel in this line of research and found that the instrument appropriately addresses the three factors of burnout and three

dimensions of the factor pertaining to burnout syndrome of the BBQ. Further, given that the validated MBI is no longer available in the Spanish language, it was important that the present study incorporate an alternative multi-dimensional burnout measure provided through the BBQ. In accordance with the studies discussed above, model fit was especially good for the dimension of emotional exhaustion but also for depersonalisation. Such an in-depth consideration of the multi-dimensional construct validity of this measure had not been previously reported.

The Spanish adaptation of SIB demonstrated good predictive and concurrent validity, being significantly and inversely related to perceived health and job satisfaction. In a study with primary care workers in California, the English-language SIB was significantly associated with both work environment and clinical team culture (Knox et al. 2018), further corroborating its application in the occupational setting. With regard to health, the present findings are in accordance with the findings that this single-item measure correlates with stress, mindfulness, resilience and self-compassion (Kemper et al. 2019).

With regard to the appropriate cut-point, the 'inclusive' scoring approach, in which burnout is diagnosed with a score of 3, 4 or 5, appears to be the most suitable. In a sample of American primary care workers, Dolan et al. (2014) reported similar specificity and sensitivity values to the present study when using the same cut-point for the English version of the same single-item instrument, although sensitivity was slightly higher (83.2% vs. 75%) and specificity slightly lower (87.4% vs. 89%). Nonetheless, in the above-mentioned study conducted by Knox et al. (2018), while specificity was higher than in the present study (>92.3%), the sensitivity of this cut-point was found to be unacceptable (50.4–58.6%). Kemper et al. (2019) also reported insufficient sensitivity for this cut-point, although specificity was adequate (82%). These differences may be explained by the different classification measures used between studies, with the present study using the BBQ, while Knox et al. (2018) used the emotional exhaustion subscale of the MBI, and Kemper et al. (2019) used the 22-item MBI.

The present study found that a 'strict' cut-point lacked sensitivity for use in the present context. Indeed, Knox et al. (2018) found an 'inclusive' cut-point to perform better than a more restrictive cut-point in which burnout was defined as scores of 4 and 5 (41.8–44.4% sensitivity and >91.4% specificity). Use of a 'strict' cut-point should be avoided, as a large number of workers suffering from burnout are likely to be missed.

It is also interesting to note that some previous studies have suggested that SIB may underestimate burnout relative to a multi-dimensional measure (Ong et al. 2021; Kemper et al. 2019). This was not the case in the present study, where, in fact, the diagnostic rate of burnout was highly similar between the two items, regardless of sex, age and professional group. This is useful as it suggests that the item could be used for screening in Spain among demographically diverse groups of health professionals.

Poor model fit regarding two of the theoretical factors limits the utility of the SIB when it comes to addressing dimensional aspects of burnout and, therefore, hampers its usefulness when tackling burnout via interventions. Other measures with better dimensional coherence should be employed following diagnosis in instances in which the subsequent aim is to treat manifestations of burnout. However, the SIB performed as well as the multi-dimensional measures from a diagnostic perspective. Given the context of the study setting and that its intended practical use at this stage is to identify cases of burnout, the potential of the SIB for this application is not affected.

Limitations and Future Directions

The present study also presents a number of limitations. Firstly, the questionnaire was accessed by 885 health professionals, but the response rate was only 76% with further non-response to sociodemographic questions; for instance, 38.4% of participants preferred not to state their sex, while 13.5% and 13% did not report their age and their professional category, respectively. Other studies have reported much lower overall response rates, for example, 25% (Dolan et al. 2014), 43.2% (Rohland et al. 2004), 56% (Hansen and Girgis 2010), 52.1%

(Ong et al. 2021) and 46% (Flickinger et al. 2020); therefore, this is not necessarily surprising. Nevertheless, future studies should seek to address this shortcoming. Secondly, while the intention of the study was to validate a screening measure for use in the specific population of Spanish health professionals, it is important to recognise that the generalisability of findings is limited, and further studies are required before administering this measure in other populations.

5. Conclusions

In conclusion, given that the SIB demonstrated adequate psychometric properties, the present study supports its use as a preliminary screening tool in health services in Spain. This would enable the incidence of burnout among health professionals to be determined, representing an essential initial step towards adopting prevention and protection measures.

Confirmatory analysis, conducted to examine the convergent validity of the instrument, confirms that the SIB adequately measures the three factors of burnout included in the BBQ. Further, analysis of this factor according to its three dimensions (emotional exhaustion, lack of personal realisation and depersonalisation) produced good-fit outcomes when examined against the second (syndrome) and third factors of the BBQ (health consequences). This being said, poor model fit was found with the first (background) and second BBQ factors when analysis was conducted considering the overall score of the full scale instead of its separate dimensions. The SIB, therefore, should only be administered as a preliminary screening instrument when evaluating the syndrome from a processual perspective, as proposed by the BBQ. In cases where the SIB cut-off point is exceeded, burnout assessments should proceed to apply other broader instruments, such as the BBQ, in order to produce the more detailed information required to guide decisions orienting preventive activities.

Another important finding of the present study is that the SIB can be administered effectively to the different demographic groups found among Spanish healthcare centre staff. Nonetheless, future studies with larger and more representative samples are required to produce cut-points adjusted for use with samples with different professional profiles.

Further, the 'inclusive' cut-point is appropriate for diagnostic use given that it produced highly similar diagnostic outcomes to a more in-depth, validated comparison burnout measure and demonstrated an appropriate balance between sensitivity and specificity outcomes. In addition, when compared with multi-dimensional measures, the SIB does not underestimate burnout, making it a reliable instrument.

The present study also reveals that the SIB predicts the effects of burnout on health and job satisfaction. This makes it a useful instrument for use in the interventions targeting prevention carried out by occupational health services. This is hugely important given that burnout is a common issue amongst health professionals.

Finally, the present research produced a validated single-item instrument to measure burnout in Spain and addresses the scarcity of validation studies of short measurement instruments at a European level.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/socsci12100546/s1>, Table S1: Percentage of burnout cases according to sociodemographic groups.

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