THE SPANISH VERSION OF THE STRESSORS IN NURSING STUDENTS (SINS) SCALE

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The Spanish version of the Stressors in Nursing Students (SINS) Scale

Accessible Summary

What is known on the subject?

- The mental health of health professionals is affected by their own work. Nurses and nursing students face high levels of stress, which results in anxiety, burnout and depression.

- There are scales that allow the measurement of specific stress levels of nursing students, especially when they first attend their clinical practices in real settings such as hospitals.

What this paper adds to existing knowledge?

- Our study consists of validating an existing scale (theStressors in Nursing Students Scale, SINS) that measures these stress levels in Spanish.

- Stress is an issue for nursing students and is related to the specific stressors they encounter in the process of their professional work and study.

What are the implications for practice?

- The validation and adaptation of this scale to Spain will allow us to adequately assess the stress levels of our students to give them adequate tools for the emotional control of their anxiety and stress.

- Once we have a reliable and appropriate tool for measuring the factors of greater impact in the generation of stress, we can implement preventive measures which may be very useful for the control of anxiety.

Abstract

Introduction: Nursing professionals and students suffer a greater number of stressors with negative health consequences.

Aim: To translate and test a Spanish version of the Stressors in Nursing Students Scale (SINS-S), with a cohort of nursing students in Spain. Also, we sought to examine the factor structure of this test and explore the psychometric structure of stress among this population.

Method: The SINS scale was translated into Spanish and administered to a cohort (n=398) of male and female Spanish nursing students in the final three years of their nursing program. Data were analyzed using exploratory factor analysis.

Results: Exploratory factor analysis revealed four factors: 'Clinical', 'Financial', 'Confidence' and 'Education'.

Discussion: There were similarities between the perception of stressors by nursing students in Spain compared with the original version of the SINS from the United Kingdom. Stress is an issue for nursing students and is related to the specific stressors they encounter in the process of their professional work and study.

Keywords: stress; mental health; ansiexty; nursing students; burnout; factor analysis.

Relevance Statement

It is the first time that the scale SINS is adapted and validated in Spanish and is the first CFA of the scale. Its use is widespread and is considered an effective tool to measure the main stress factors that nursing students face during their studies. The scale can be used in Spain to measure the sources of stress levels of our students as well as detect the main problems. Taking care of the student's mental health will lead to more prepared and healthy professionals.

INTRODUCTION

The levels of workplace stress or burnout are higher among health professionals when compared to other jobs or professions (Skovholt, & Trotter-Mathison, 2014). Previous research has found that particularly, nursing professionals and students suffer a greater number of stressors with negative health consequences (Tomaschewski-Barlem, Lunardi, Lunardi, Barlem, Silveira, & Vidal 2014). In the case of students, stress is a psychosocial factor that influences both their academic performance and sense of wellbeing (Rudman, & Gustavsson, 2012; Sanderson, & Brewer 2017). Nursing students not only have to face academic stress, but also the stress encountered during their professional training period (Pulido-Martos, Augusto-Landa, & Lopez-Zafra 2012). Some of the most common stress factors are time pressures, workload, decision-making, continuous changes and errors made during clinical placements (Rudman, & Gustavsson, 2012).

The negative consequences of lacking the appropriate coping strategies for stress during the student years, and working life, has an impact both on the health and the mental wellbeing of the individual, as well as on their professional performance (van der Riet, Rossiter, Kirby, Dluzewska, & Harmon 2015). Several studies indicate that optimal professional performance is mediated by specific psychological characteristics (Pitt, Powis, Levett-Jones, & Hunter 2012; Thomas, & Asselin 2018). More specifically, academic success seems to be related to personality traits, acquired cognitive resources, and coping strategies, rather than solely the educational process (Pulido-Martos et al., 2012; Rudman & Gustavsson 2012; Sanderson, & Brewer 2017). Some of the potentially stressful aspects of nursing, such as its hierarchical and multi-professional nature, can be more intense for students as they can feel inferior and at the bottom of the hierarchy as well as relatively unfamiliar with professional roles (Ratanasiripong, Park, Ratanasiripong & Kathalae 2015).

It is interesting to know what stressor factors are present and to what extent these affect nursing students. Understanding these can help us design effective coping strategies and provide emotional management resources, both of which can prove invaluable for both students and professionals (Wolf, Stidham, & Ross 2015). Of the different scales available, The Stressors in Nursing Students (SINS) Scale is a recent instrument with good psychometric properties to effectively evaluate the various factors that can affect nursing students: (Deary, Watson, & Hogston 2013).

The SINS was developed in English and has since been translated into several languages (Watson, Yanhua, Ip, Smith, Wong, & Deary 2013; Watson, Watanabe,

Yamashita, Yamaguchi, Bradbury-Jones, & Irvine 2018; Watson, Rehman, & Ali 2017). The SINS is a 43-item instrument with questions on a range of stressors that nursing students are liable to encounter, including academic, clinical, financial and confidence – related stressors. Items are responded on a five-point Likert type scale from: 'not stressful at all' (1 point) to 'very stressful' (5 points). Higher total scores represent sources that are more stressful.

The aim of this study was to translate and test a Spanish version of the Stressors in Nursing Students Scale (SINS-S), with a cohort of nursing students in Spain. Also, we sought to examine the factor structure of this test and explore the psychometric structure of stress among this population.

METHODS

Participants

A convenience sampling method was used to recruit nursing students in their last three years of study at the Faculty of Nursing of the University of XXX (XXX, Spain) during the 2017/2018 academic year. Nursing students aged 18 or older were eligible to participate in the study. The students were informed of the purpose of our study prior to their participation. All the participants signed the informed consent forms and completed the SINS-S during rest periods. They were informed that if they had any questions they could ask the research assistants at any time.

The first sample of 368 participants was recruited from 379 eligible nursing students in their 2nd, 3rd and 4th year for the exploratory study. Students in their first year were excluded due to their lack of experience, as the data were collected at the beginning of the academic year. The response rate was 100% for the test–rest reliability. The students completed the questionnaire within a university classroom environment.

The translation procedure for the SINS scale

A forward-backward translation procedure was applied to establish the content validity of the SINS scale (Sousa, & Rojjanasrirat 2011). Firstly, the SINS was translated into Spanish by two bilingual translators who were both nursing PhDs. The two translators

combined their translations through a process of reconciliation and decided that the final version of SINS-S was a linguistic and conceptual match to the original English version. Secondly, an English lecturer translated the Spanish version back into English (blinded to the original version). Finally, the back-translated scale was compared to the original by the authors to establish the content validity of the back-translated instrument. Once consensus was reached for the working of all times, the preliminary version was produced.

Ethical considerations

This study was provided written approval by the University Academic Committee. All participants were provided detailed information regarding the study aims and methods. The questionnaire used in this study was anonymous, and verbal consensus was obtained before its compilation. All data collection measures were kept in envelopes and the authors of the study had exclusive access to the same.

Statistical Analysis

The SPSS 22.0 software package and Amos 19.0 were used for statistical analysis. Quantitative variables were summarized as mean values, standard deviations, and the median. The qualitative variables were summarized as frequencies and percentages. The item-total correlation was applied to identify the problematic items of the SINS-S. The item-total correlation coefficients ($p < .001$) were used as the criterion in the process of item-total correlation. To determine the number of factors to retain we applied Kaiser-Meyer-Olkin and Barlett's "Eigenvalues greater than one" criterion. Oblique rotation (varimax rotation) (and Monte Carlo parallel analysis for PCA) was used in the exploratory factor analysis (EFA) (a multivariate statistical technique) as the factors were expected to correlate. Factor loadings ≥0.3 were considered appropriate and were retained in the final questionnaires.

Three types of reliability estimates were used to assess the reliability of the SINS-S. The internal consistency reliability was evaluated by calculating Cronbach's alpha coefficient and split-half reliability. Item reliabilities were assessed by test–retest reliability. A Cronbach's alpha coefficient of 0.70 or greater was considered statistically acceptable.

A confirmatory factor analysis (CFA) model was conducted using Amos 17.0 to confirm the factorial structure of the SINS-S identified in the exploratory study. Model fit statistics/indices, such as model $\chi 2$ (chi-square), $\chi 2/df$, CFI (Comparative Fit Index), RMSEA (Root Mean Square Error of Approximation), NNFI (Non-normed Fit Index) and IFI

(Incremental Fit Index) were used to model the goodness-of-fit assessment. Model fit was considered acceptable if $\chi 2/df \leq 3$, RMSEA < 0.08, CFI > 0.90, NNFI > 0.90, and IFI > 0.90.

RESULTS

Demographic data

In total, 368 questionnaires were gathered. The mean age was 21.75 years (SD 4.73), and 84.4% of respondents were women. The distribution by academic year was: 39.7% students in their second year, 34.5% in their third year and 25.8% in their fourth year. There were no statistically significant differences related to age or academic year which confirmed the homogeneity of the sample in terms of these sociodemographic two variables. Male students scored significantly higher on stressors than female students, and there were no significant differences between second, third and fourth-year students.

Descriptive Statistics of the Scale Items

Construct Validity. To examine the construct validity, the principal component analysis of the SINS-S with varimax rotation was estimated. In this study, the Kaiser–Meyer–Olkin value was 0.883 and Bartlett's test of sphericity was highly significant (p=.000). The analysis of communalities indicated that all the items were above 0.5, therefore all questions were accepted as valid for forming part of the questionnaire. Principal component analysis obtained four components or main factors, with eigenvalues greater than 1, which explain 60,58% of the total explained variance.

Each item was included in a single factor, according to its factorial

loading, establishing acceptable minimum loadings of 0.30. The initial solution indicated that there were 10 components with eigenvalues greater than one

suggested either three or four components. The Monte Carlo parallel analysis for PCA provided four components. The rotated factorial solutions, according to varimax, conformed a well-defined structure without overlaps which were congruent, in terms of item content, with those obtained previously in the SINS: Clinical, Finance, Confidence and Education. Table 1 displays the items of the scale with their respective factorial loading for each of the four factors.

INSERT TABLE 1

Reliability

To evaluate the internal consistency of the scale, a Cronbach's alpha value of 0.928 was obtained. This value was not improved when removing some of the items, therefore all items were maintained. All the questions were answered by 100% of the students (see Table 2).

INSERT TABLE 2

Confirmatory Factor Analysis

A CFA was performed, resulting in 43 items in four scales (Table 3). The 4-factor CFA model fits data very well: $\chi2/df = 2.235$, CFI = 0.911, RMSEA = 0.025, NNFI = 0.903, IFI = 0.910 (see Table 3). All the standardized factor loadings were statistically significant.

INSERT TABLE 3

DISCUSSION

The results of the present study, which were based on a large sample of nursing students in Spain, support the original four-factor structure of the SINS obtained from both the original and previous versions of the test. The four factors of 'Clinical', 'Financial', 'Confidence' and 'Educational stress' are apparent in this Spanish version. This factorial structure, which coincides with the original scale (Deary et al., 2003), has not been exactly replicated in other versions, such as the Chinese, Japanese and Pakistani versions (Watson et al., 2013, 2017, 2018). In these, it was necessary to perform a more elaborate confirmatory factorial analysis in order to confirm the four factors. However, according to the authors, the results are still debatable and require further research (Watson et al., 2013). It is feasible that the results of our study are similar to the original version because there are not many differences in the British and Spanish nursing educational programs. Not only do both share the European Higher Education Area but, Spanish nursing students are generally in demand to work in the United Kingdom because their academic education is so similar (Goodman, Jones, & Macias 2008).

The importance of evaluating the level of stress and the factors that most generate stress among students is already supported by several studies as being an important pedagogical tool (Pulido- Martos, et al., 2012). In a recent review on the subject McCarthy et al. (McCarthy, B., Trace, O'Donovan, Brady-Nevin, Murphy, O'Shea et al., 2018) already concluded that stress is pervasive in all aspects of undergraduate nursing education and

nursing educators need to be aware of the impact of the same to provide appropriate support to students in both the clinical and academic environments.

Over the course of several studies (Deary et al., 2003; Watson et al., 2013, 2017, 2018 Salamonson, Andrew, Watson, Teo, & Deary 2011) the SINS-S has proved to be a potentially useful instrument to measure stress in diverse groups of students.

The stress experienced by students is similar to that of professional nurses (Akhu-Zaheya, Shaban, & Khater 2015). This issue is strongly related with the development of coping techniques and tools for the management of anxiety (Labrague, McEnroe-Petitte, Gloe, Thomas, Papathanasiou, V., & Tsaras 2017). An academic education which helps prevent this situation will lead to professionals experiencing a greater sense of resilience and emotional control, as well as a lower rate of burnout, a fairly common phenomenon in current times (Koy, Yunibhand, Angsuroch, & Fisher 2015; Thomas, & Revell 2016). Once we have a reliable and appropriate tool for measuring the factors of greater impact in the generation of stress, in this case, by using the SINS-S, we can implement preventive measures which may be very useful for the control of anxiety, as supported by recent studies (Labrague et al., 2017; McCarthy et al., 2018). However, the true impact of the same must be followed closely by monitoring student's at baseline.

The SINS-S version of the scale presented in this study needs to be tested for convergent and predictive validity against other tools to measure similar phenomena to stress and related phenomena, such as psychological morbidity, coping mechanisms and burnout. A possible limitation of this study is that a decision was intentionally made to not use this scale with students in their first year as they were still lacking contact with clinical placements which could have distorted the validation results. This aspect has already been identified as being important in other similar studies based on the context of stress during clinical placements rather than the academic demand (Turner, & McCarthy 2017). Other limitation is that we must take cautiously the comparative results between the students of Spain and the students of the UK, because it is likely that being a program of different studies as well as different cultural characteristics, give rise to different stressors.

CONCLUSIONS

We successfully translated the SINS into Spanish and administered it to a cohort of Spanish nursing students. The CFA revealed possible similarities between the perception of stressors by nursing students in Spain compared with the United Kingdom. Findings can inform the development of strategies to reduce such stressors among nursing students in

multiple, global contexts. Further research is needed to understand the experience of stress from a students' perspective, as well as the perceived barriers and facilitators for supporting the students from the preceptors'/mentors' perspectives.

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Table 1. Results of the exploratory factor analysis and factorial saturation of items after varimax rotation.

	Factor 1	Factor 2	Factor 3	Factor 4
8 Patients' attitudes towards me	**.581**	-.168	-.121	.260
9 Fear of making a mistake in clinical placements	**.714**	-.262	-.317	.069
11 Relations with staff in the clinical area	**.795**	-.207	-.132	.051
12 Caring for the emotional needs of patients	**.710**	-.154	-.134	.153
13 The attitudes and expectations of other professionals	**.757**	-.124	-.285	.100
14 Being interrupted in clinical duties	**.736**	-.131	-.187	.212
15 Not having enough staff or equipment to meet patients' needs	**.763**	.369	-.155	.043
20 Dealing with unco-operative, anxious, abusive or otherwise difficult patients or relatives	**.525**	.403	-.279	-.041
21 Conflicts with staff in placements	**.659**	-.039	-.403	-.089
23 Not being sure what is expected in the course	**.795**	-.207	-.132	.051
24 Criticism from peers or senior staff	**.681**	-.258	-.287	-.114

34 Not being sure what is expected on placements	**.807**	-.254	.107	-.100
39 Feeling responsible for what happens to patients	**.795**	.172	.224	-.003
40 Speaking to patients' relatives	**.837**	-.056	-.033	-.027
43 Coping with suffering or death of patients	**.612**	-.241	-.020	.255
10 Competition from fellow students	**.714**	-.262	-.317	.069
32 Patients' attitudes toward nursing	**.710**	-.154	-.134	.153
5 Personal problems other than health	-.214	**.707**	-.234	.241
16 Fear of poor job prospects	.051	**.829**	-.014	-.202
17 Conflicts with peers	.211	**.702**	.014	.040
27 Conflicts with administrators or managers	.158	**.757**	-.078	.148
31 Not having anyone to talk to about course problems	-.124	**.792**	-.027	.149
36 Conflicts with college staff	-.140	**.759**	-.132	.051
38 Personal health problems	.113	**.448**	.145	.450
41 Making less money than friends who are not nurses	.254	**.794**	-.175	.278

42 Physical health of family members	-.298	**.655**	.269	.001
22 The lack of free time	-.450	**.642**	.078	-.078
26 The college response to student needs	-.122	**.712**	.218	.007
37 Surviving on a low income	-.259	**.628**	-.067	-.121
1 The amount of classwork material to be learned	-.303	.214	**.597**	-.029
4 The difficulty of the classwork material to be learned	-.450	-.547	**.642**	-.078
6 Not getting enough feedback about performance	-.122	.568	**.712**	.007
7 Examinations and placement gradings	-.259	.214	**.628**	-.121
29 Meeting deadlines for coursework	.165	-.182	**.795**	-.052
33 Fear of failing in the course	.124	-.137	**.800**	-.164
2 Relationships with family members	-.303	.095	**.595**	-.029
30 Relations with other professionals	-.450	.125	**.642**	-.078
3 Having too much clinical responsibility	.215	-.151	.256	**.730**
18 Having too much to learn	-.151	.015	.158	**.535**

19 The atmosphere created by teaching staff	-.030	.008	.049	**.931**
25 Not having enough time for friends and family	.029	-.103	.540	**.658**
28 Not having enough money for entertainments	.049	.258	.105	**.657**
35 Having no time for entertainment	.257	.029	.404	**.683**

Table 2. Internal consistency of the scale and the four factors.

	α
Scale	0.928
Factor 1. Clinical factor	0.911
Factor 2. Finance factor	0.928
Factor 3. Confidence	0.879
Factor 4. Education factor	0.825

Table 3. Model fit index of CFA (n=368).

$\chi 2$	$\chi 2/df$	CFI	RMSEA	NNFI	IFI
1234.12	2.235	0.911	0.025	0.903	0.910

CFI (Comparative Fit Index); RMSEA (Root Mean Square Error of Approximation); NNFI (Non-Normed Fit Index); IFI (Incremental Fit Index)