Original Article

The Reliability of the Turkish Version of the Stressors in Students Scale

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Abstract

Background: Nursing students experience stress during their education and in clinical practice.
Aim: The aim of this methodological study was to adapt the Stressors in Students Scale (SIS) into Turkish and to evaluate its psychometric properties for a Turkish nursing student population.
Methodology: The psychometric properties of the scale were examined by collecting data from 309 nursing students.
Results: An exploratory factor analysis identified that the eigenvalues for the two factors of the scale were 25.91 and 23.40; these two factors explained 49.32 % of the variance. Cronbach's Alpha for the total scale was 0.79, and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy coefficient was 0.76.
Conclusions: This instrument can be used to measure stressors in nursing students. Further studies are needed to test the psychometric properties of this scale in different cultures.

Key words: Nursing training, nursing student, psychological stress

Introduction

Levels of stress are higher for health professionals than for other workers (Pulido-Martos, Augusto-Landa & Lopez-Zafra 2012), and nursing students and persons employed in the nursing profession have been identified as a population with an elevated stress level (Al-Barrak, El-Nady & Fayad 2011). Nursing training is a stressful process (Oner Altıok & Ustun 2013), and nursing professionals suffer from a high number of stressors with negative health consequences. Stress is a psychosocial factor that influences the academic performance and well-being of this group. The interest in analysing sources of stress in nursing students comes from the influence that their training period may have on their perceptions of stress in their future work (Pulido-Martos, Augusto-Landa & Lopez-Zafra 2012), It is important for the university to maintain a well-balanced academic environment conducive to better learning, with the focus on the students' personal needs.

Background

Nursing students suffer higher levels of stress during their college years than college students in other disciplines. Stressors for student nurses include adjusting to a rigorous program of theory, long hours of study and the pressures of student

clinical practice, requiring emotional and personal maturity (Al-Barrak, El-Nady & Fayad 2011). Nursing students experience stress in clinical practice and also from sources such as separation from home, financial worries, regular clinical and educational assessments and frequent changes in clinical environments (Watson et al. 2009). Another study by Edwards et al. (2010) showed that levels of self-reported stress are significantly different at different stages in the nurse training process. Stress in nursing students does not just have negative effects on the nurses themselves; ultimately it will have a negative effect on the nursing workforce. These deleterious effects of stress on the workforce include leaving it periodically or permanently through stress-related illness (Watson et al. 2009).

In Turkey an increasing amount of research is being carried out in relation to stressors in nursing students. In a study by Guler and Çınar (2010) with the aim of determining the perceived stressors in 240 nursing students, it was found that nursing students experienced stress due to different causes: 25.8 % due to lessons, 10 % due to practice, 13.3 % due to the physical environment and 3.8 % due to lecturers.

In a study by Watson et al. (2009) following a cohort of 147 nursing students from entry to their programme to the end of the first year and studying the interrelationship between a range of psychological variables including personality, stress, coping and burnout, the students suffered greater levels of psychological morbidity and burnout at the end of the year and this was largely explained by the personality trait of neuroticism. Stress also increased and this was largely explained by emotion-oriented coping. The authors concluded that undertaking a nursing programme leads to increased level of stress, burnout and psychological morbidity and this is largely related to individual personality and coping traits (Watson et al. 2009).

In a study by Ozkan and Yılmaz (2010) in 167 nursing students, it was found that the students who more frequently used a self-confident approach, an optimistic approach and or a social support seeking approach to coping with stress had a decreased tendency to depression. In a study carried out in 15 second year nursing students to determine their sources of stress, it was found out that the stress sources of students were both internal and external. Four main categories were identified as a result of the interviews: clinical practice, theoretical training, social personal lives, and themes and sub-themes related to these. These themes were sources of stress from the trainer, therapist, nurses, patients, the students themselves, and for practice (Oner Altıok & Ustun 2013). This descriptive study on 83 first-year students studying in the Nursing and Midwifery department of a Vocational College of Health in the province of Çanakkale was carried out in order to determine the stress levels which the freshmen in the Nursing and Midwifery College experienced after their first clinical practices, and the factors which affected them. The research was conducted on a voluntary basis in the educational year 2009 - 2010. In the research, the average score of the students' Clinical Stress Survey (CSS) was calculated as 54.2 ± 8.9, and it was found that the students experienced above-average stress. While a significant difference was found between the students' departments and total average scores ($t=2.65$, $p=0.010$) and between their receptivity to the clinic and the CSS's low dimension of average score, it was seen that there was no significant difference between introduction of the clinic before the clinical experience and students' receptivity to the clinic and average CSS scores. It was found out that the stress levels of students of Nursing and Midwifery at the end of the first day in clinical practice were above average (Atay & Yılmaz 2011).

In a study to investigate the interaction between self-efficacy and perceived stress in the clinical learning environment in 293 students by Zengin (2007), results indicated that stress had a great effect on students in the clinical learning environment. In a study by Evans & Kelly (2004) to examine the stress experiences and coping abilities of student nurses in a large Dublin teaching hospital, findings showed that examinations, the level and intensity of academic workload, the theory-practice gap and poor relationships with clinical staff were the leading stressors identified. According to (Yonge, Myrick & Haase (2002), "student nurses appear to experience significantly more stress during their academic preparation than they do during the first

year of employment. Preceptorship is among the most stressful of student experiences. It is within the context of a challenging and at times daunting work environment that two complete strangers (preceptor and student) strive to accommodate one another within a professional capacity. If the relationship between preceptor and student is less than successful, not only can it be frustrating and disheartening, but it can result in student stress and disillusionment about nursing and an inability to integrate and learn" (Yonge, Myrick & Haase (2002).

In a systematic review of the scientific literature on stressors in nursing students by Pulido-Martos et al. (2012), it was concluded that the most common source of stress was related to academic work (reviews, workload and problems associated with studying, among others). Other sources of stress included clinical sources such as fear of unknown situations, mistakes with patients or handling technical equipment (Pulido-Martos, Augusto-Landa & Lopez-Zafra 2012). In a study by Ully (2004), sources of stress among psychiatric nursing students (n=35) were measured and it was concluded that all students were significantly distressed, and had limited coping skills. Preparing to become a nurse in this setting was found to be significantly emotionally stressful and a possible risk to the well-being of students (Ully 2004). In a study to identify sources of stress as perceived by undergraduate nursing students at King Saud University, the Student Stress Survey was used to study the major sources of stressors among college students. This included items addressing academic, intrapersonal, interpersonal, and environmental sources of stress. The study results concluded that there were a variety of stressors placed on the subjects studied. The major sources of stress as perceived by King Saud University College of Nursing students were academic, followed by intrapersonal, then environmental, and the last was interpersonal (Al-Barrak, El-Nady & Fayad 2011). In another study, the results suggested that nursing students experience different levels of stress and depression and that these factors are positively correlated (Papazisis et al. 2008). The present study examined reported stress in 110 third-year nursing students in 12 areas commonly reported to cause stress to nursing students, and the results indicate that stress exists for students in both the clinical and academic aspects of the programme. Financial constraints and academic-related concerns emerged as the most stressful areas for the students. A third of the students reported that relationships with teachers and staff on the ward cause some degree of stress. Factor analysis revealed that five factors emerged as sources of stress. The first were academic stress factors. The second and third components concerned relationships, the former involving teaching-related staff, and the latter involving the clinical experience. The last two components suggested that finance and the death of patients are independent sources of stress (Timmins & Kaliszer 2002).

Aim

The study was carried out to translate the SIS Scale into Turkish and to test its validity and reliability in nursing students.

Methodology

A cross-sectional and methodological design was used in the study.

The study was conducted in Ege University Nursing Faculty, Izmir Katip Çelebi University Faculty of Health Science Nursing Department and Sifa University Faculty of Health Science Nursing Department. The sample consisted of 309 first year nursing students who participated in the study voluntarily.

A questionnaire related to the demographic characteristics of the students and the SIS Scale was used in data collection. The student information form was developed for this study by the researchers. This form included students' characteristics such as age and gender.

The Stressors in Students (SIS) Scale developed by Salamonson et al. (2011), was developed based on the Stressors of Nurse Students Scale (SINS) devised by Deary, Watson & Hogston (2003) and consists of a total of 11 items and two subscales.

Training components are evaluated in questions 1, 2, 3, 4, 5, 7 and 8, and financial components are evaluated in questions 6, 9, 10 and 11. The SIS Scale items are scored on a 5-point Likert scale with scores ranging from 1 (not at all stressful) to 5 (extremely stressful). A total score consisting of the sum of the individual items is created such that

higher total scores represent greater stressors. The reliability coefficient of the subscales of the scale is 0.85.

The first questionnaire was used to collect information on demographic characteristics. Afterwards, the SIS was completed by the researcher. Data were collected by four of the researchers between 18 March and 26 April 2013. The duration of interviews was approximately 15 minutes for each student.

The study was approved by the Ethical Committee of Ege University Nursing Faculty, and written permission was obtained from Ege University Nursing Faculty, Izmir Katip Çelebi University Faculty of Health Science Nursing Department and Sifa University Faculty of Health Science Nursing Department. Permission to use the scale in our study was obtained from Salamonson et al. (2011) by mail. The students were informed about the aim of the study.

Adaptation in Turkish and Content Validity of the SIS Scale

The SIS Scale was separately translated from English to Turkish by ten academically prepared educationalists (RN, Ph.D. assistant professor, and professor) who are lecturers in the Nursing Faculty. The scale was retranslated from Turkish to English by two language scientists whose main language was Turkish to determine whether it conformed to the original content. The translation and back-translation conformed to the original version. Thereafter, the authors prepared the first Turkish version of the SIS Scale by comparing and evaluating the ten translations. The first Turkish version of the SIS Scale and the original English version were presented to three experts in the field of nursing. The experts checked the first Turkish version of the SIS Scale to assess its content validity and compatibility with the Turkish language. The final Turkish version of the instrument was revised by the researchers in accordance with the suggestions of the experts.In the experts' evaluation, the Content Validity Index (CVI) was used. The experts' evaluation scores were evaluated by Kendall W analysis. Some items were revised again in accordance with the opinion of the experts and necessary corrections were made. Kendall's W value relating to consistency between the eight experts for items on the scale was found to be 0.767. No difference was seen between the points which the experts gave. The points given by the experts to the scale items varied between 1 and 4. After evaluation of the opinions of the experts and necessary corrections, no points were observed under three, which is the lowest acceptable mean score, and no item was removed from the scale as a result of context validity. An exploratory factor analysis and a confirmatory factor analysis were used to determine the construct validity of the scale. In the examination of the structure of the factor, the Principal Components Analysis Varimax rotation method was used. Accordingly, scale factor patterns, eigenvalues and the variance percentages which they explain were evaluated. The Kaiser-Meyer-Olkin (KMO) index, which is a criterion for determining whether items are appropriate for basic component analysis, was investigated for an exploratory factor analysis (EFA) sample. The KMO index was 0.767 for the EFA sample (Bartlett's=997.330, p=0.00). Initial factors were extracted using the basic components analysis, and rotations were then performed by the Varimax method.

Construct Reliability of the Turkish Version

Calculation of Cronbach's alpha coefficient, material analysis and half test reliability methods were used to determine the internal consistency of the SIS scale. The Statistical Package for the Social Sciences for Windows version 17 was used for statistical analysis of the data.

Results

The majority of the students were more than 20 years old and the mean age of students was 19.77$\pm$1.46 years. The majority of the students (83.8 %) were female, and more than half 56.6 (%) had chosen the profession willingly. Because the item-total correlation was above 0.20 on all of the items, no item was removed from the scale.

Cronbach's Alpha for the total scale was 0.79. For the educational component, Cronbach's Alpha was 0.75 and for the finance component it was 0.79. The minimum score which can be obtained from the scale is 11, the maximum possible score is 55, and the total mean score in our study was 35.29$\pm$7.44.

Table 1: Item-total Score Correlations in the SIS (n=309)

Items	Item Total Correlations
The amount of lesson content (material) to be learned	.368
The difficulty of lesson content (material) to be learned	.422
Examinations and assessment degrees	.464
Having too much to learn	.484
Not being sure what is expected in the course	.385
Lack of money for entertainment	.526
Do homework in time	.425
Fear of failing in the lesson	.466
Lack of time for entertainment	.478
Living on a low income	.467
Having less money than friends have	.437
Cronbach's Alpha: .792	

Table 2: Mean Total Scores on the Stressors in Students Scale and its Subscales

Scale and Subscales	Minimum	Maximum	Mean	Standard Deviation	Cronbach Alpha
Stressors in Students Scale	11.0	55.0	35.29	7.44	0.79
Education components	9.0	45.0	23.54	5.06	0.75
Finance components	4.0	20.0	11.76	3.99	0.79

An increase in the total score on the scale indicated a corresponding increase in the students' perceived stress levels. The seven-item education components of the scale had a mean score of 23.54±5.06, and the four-item finance components of the scale had a mean score of 11.76±3.99. The fact that the students' mean score on the subscales relating to financial position was lower than that relating to education shows that the students experienced more stress relating to education (Table 2).

Internal Consistency

Internal consistency reliability coefficients were calculated for the eleven-item Stressors in Students Scale and its subscales. To determine the internal consistency of the SIS scale, calculation of Cronbach's alpha coefficient, material analysis and half test reliability methods were used. The internal reliability coefficient of the SIS scale was found to be Cronbach's alpha 0.792 (n=11), for the subscales it was Cronbach's alpha 0.755 (n=7) for education and Cronbach's alpha 0.755 (n=4) for finance. Because the correlation of item-total was above 0.20 for all of the items, no item was removed from the scale.

Half Test Reliability Analysis

Internal consistency reliability coefficients of the SIS Scale were found to be Cronbach's Alpha 0.792 (n=11). The correlation between the two halves of the SIS was found to be 0.703. The

Cronbach's alpha coefficient of the first half (11 items) was found to be 0.691, and that of the second half (11 items) was found to be 0.535. The Spearman-Brown coefficient was found to be 0.699 and the Guttman split-half coefficient was found to be 0.696.

Table 3: Exploratory Factor Analysis of SIS

Items	Factor 1 (Education)	Factor 2 (Finance)
Item 1	.662	
Item 2	.655	
Item 3	.692	
Item 4	.691	
Item 5	.578	
Item 6		.808
Item 7	.438	
Item 8	.629	
Item 9		.590
Item 10		.854
Item 11		.807
Eigenvalue	25.91	23.40
Variance explained	49.32	

An exploratory factor analysis identified that the eigenvalues for the two factors of the scale were 25.91 and 23.40 respectively for the factor education and finance; these two factors explained 49.32 % of the variance. A confirmatory factor analysis indicated a sufficient model fit for the construct validity of the scale. When the factor analysis was made, it was found that there were seven items in the field of Education, and four in the field of Finance and that they were the same as the original scale (Table 3).

It was found that the sampling adequacy of 0.767 calculated as the KMO value and the size of the testing sample of Bartletts Test of Sphericity (x^2=997 330 p=0.000) were quite sufficient for factor analysis.

In testing the construct validity of the SIS Scale in methods of comparison of groups which are known, the results relating to distribution of the students' average scores according to their age groups, place of residence, gender, voluntary choice of profession and place of longest residence were evaluated. In order to test the construct validity of the SIS scale, results relating to the students' age groups, gender, willingness in choice of profession and place of longest residence were evaluated by the method of comparing known groups. One-way analysis of variance (ANOVA) was performed between the mean scores obtained from the SIS Scale and the age variable. According to the results of ANOVA, there was no statistically significant difference between the total mean scores according to age groups (F=1.045, p>0.05), there was no statistically significant difference between the total mean scores according to their place of residence (F=0.357, p>0.05), and the

mean scores did not vary according to their gender (t=0.392, p>0.05).

Discussion

When a scale is adapted to Turkish, reliability and validity testing are the basic psychometric studies. If a tool is not accurate or reliable or does not make accurate measurements, or does not serve its purpose as a measuring tool, it is not suitable for use. This makes it necessary for the reliability and the validity of measuring instruments to be addressed together. Although the validity of a measurement instrument depends on its reliability, in practice a measurement tool which is reliable but not valid is of no great use.

Content validity is the degree to which the items in a measurement tool represent in a balanced way the topics at which the measuring tool is aiming. Content validity is the degree to which the items on the measurement scale represent in a balanced way the topics which the measurement scale is intended to measure. Therefore what is desired to be measured should be sampled well. Therefore the characteristic to be measured should be sampled well. Expert opinion is to be taken with regard to the questions contained in the measuring tool as to whether they are suitable for the purpose, and whether they represent the area to be measured. Reliability is the main feature which each measuring tool must carry; it is the ability to measure free from errors as a measurement tool. If items are removed from the scale because of a low correlation between the items and the total score, this has a lowering effect on reliability. An item is removed from the scale if it lowers reliability because its correlation with the total score is low. In our study, no item with a total correlation of less than 0.20 was detected as a result of item analysis to determine the internal consistency of the scale. The study adapted and tested the validity and reliability of the SIS Scale. A confirmatory factor analysis demonstrated a sufficient model fit for the construct validity of the scale. The Cronbach's Alpha for the total scale was 0.79. It can be concluded that the SIS scale has good construct validity, but moderate internal consistency. Our findings are consistent with the results of Salamonson et al. (2011).

This study tested the psychometric properties of a questionnaire that measured sources of distress and eustress, or good stress, in nursing students. The Transactional model of stress construes stress in these different ways and is frequently used to understand sources of stress, coping and stress responses. Limited research has attempted to measure sources of distress and eustress or sources that can potentially enhance performance and well-being. A volunteer sample of final year nursing students (n=120) was surveyed in the United Kingdom in 2007. The questionnaire measured sources of stress, and measures of psychological well-being were taken to test construct validity. This was tested through an exploratory factor analysis. This reduced the questionnaire from 49 to 29 items and suggested three factors: learning and teaching, and placement related and course organization; second, it was analyzed by testing the assumptions of the Transactional model, the model on which the questionnaire was based. In line with the assumptions of the model, measures of distress related to adverse well-being, and measures of eustress related to healthier well-being responses. The test-retest reliability estimate was 0.8. While certain programme issues were associated with distress, placement-related experiences were the most important source of eustress (Gibbons, Dempster & Moutray 2009).

Conclusion and Recommendation

In conclusion, this instrument can be used to measure the stressors in nursing students in Turkey. The SIS is a reliable and valid research tool that can help to evaluate students' stressors. The study reported in this paper has demonstrated the steps that need to be taken in order to test successfully the appropriate application of the tool to a Turkish population. This study was implemented with first year nursing students only, because one of the nursing schools in which the study was implemented had begun teaching only one year before. This may have affected the results of the study. This study should be implemented in nursing students in different years.

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The study was conducted in Ege University Nursing Faculty, Izmir Katip Çelebi University Faculty of Health Science Nursing Department and

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