Análisis psicométrico de la escala de estrés para profesionales mexicanos de enfermería

Psychometric analysis of the stress scale for Mexican nursing professionals

A análise psicométrica da escala de estresse para os enfermeiros mexicana

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Resumen

La profesión con mayor porcentaje de sintomatología por estrés es enfermería, por lo que este debe valorarse mediante cuestionarios validados y adaptados a la función específica.

El objetivo del presente estudio es identificar la estructura factorial de *The Nursing Stress Scale* (NSS) para estimar el nivel de estrés laboral percibido por el personal de enfermería de un hospital de beneficencia en la ciudad de Guadalajara, México. Para ello se encuestó a 164

trabajadores de enfermería bajo consentimiento informado, se realizó el análisis factorial para identificar variables latentes y se utilizaron los métodos de componentes principales con rotación *varimax* y de *máxima verosimilitud* con rotación *promax*. En los resultados se obtuvieron cuatro factores que explicaron 47.3 % de varianza, renombrados como: eficiencia laboral, interacción emocional, relación profesional y muerte/sufrimiento. Posteriormente se calificó a los participantes con los coeficientes factoriales, ubicándolos en tres niveles: bajo, medio y alto. Las conclusiones fueron que la escala NSS presentó una estructura factorial de cuatro dimensiones con las fortalezas psicométricas (validez y fiabilidad), y que las variables latentes con mayor puntaje de estrés percibido por el personal de enfermería fueron eficiencia laboral y muerte/sufrimiento.

Palabras clave: estrés laboral, emocional, muerte-sufrimiento, eficacia.

Abstract

The profession with higher percentage of symptoms by stress is nursing, It should be assessed using questionnaires validated and adapted to the specific function.

The objective of the present study is to identify the structure factor of *The Nursing Stress Scale* (NSS) to estimate the level of work-related stress, perceived by nurses from a hospital charity in the city of Guadalajara, México. Were surveyed 164 workers of nursing under informed consent, analysis factor was used to identify latent variables and utilized Principal Component Analysis (PCA), with *varimax rotation* and *maximum possible variance* with *promax rotation*. As results were obtained four factors that explained 47.3% of variance, renamed as: labor efficiency, emotional interaction, professional relationship and death/suffering. Subsequently participants where qualified with factorial coefficients, placing them at three levels: low, medium and high. The conclusions were that the NSS scale presented a factor structure of four dimensions with psychometric strengths (validity and reliability), and the latent variables with a higher score of stress perceived by nurses were work efficiency and death/suffering.

Key Words: work-related stress, emotional, death suffering, efficacy.

Resumo

A profissão com o maior percentual de sintomas de estresse é de enfermagem, de modo que este deve ser avaliada através de questionários validados e adaptado à função específica.

O objetivo deste estudo é identificar a estrutura fatorial da Enfermagem Estresse Scale (NSS) para estimar o nível de estresse no trabalho percebida pela equipe de enfermagem de um hospital de caridade na cidade de Guadalajara, no México. Para que isso 164 trabalhadores de enfermagem foram pesquisadas sob consentimento informado, análise de fator foi realizada para identificar as variáveis latentes e métodos de componentes principais com rotação varimax e promax de rotação máxima probabilidade foram utilizados. eficiência do trabalho, a interação emocional, relação profissional e da morte / sofrimento: os resultados em quatro fatores que explicaram 47,3% da variância, rebatizado obtido. participantes posteriores foram classificados com os coeficientes de entrada, colocando-os em três níveis: baixo, médio e alto. As conclusões foram que a escala NSS apresentou uma estrutura fatorial de quatro dimensões com as forças psicométricas (validade e confiabilidade) e que as variáveis latentes com a maior pontuação de estresse percebido pelos enfermeiros estavam trabalhando eficiência e morte / sofrimento.

Palavras-chave: estresse no trabalho, emocional, morte, sofrimento, da eficácia.

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Introduction

Since Selye introduced in 1936 the concept of stress in the study of behavior as simile of the meaning that Physical Science gives to the reaction of inert bodies to the influence of external conditions, it is conceived in the human being as a global response that modifies its physiology and behavior for its adaptation (Sandín, 2003; Salguedo-Madrid, Mo-Carrascal and Monterrosa-Castro, 2013). Currently, there are different definitions of stress, but all include the identification of a set of reactions emotional, cognitive, physiological and behavioral.

In accordance with the transactional theory of Lazarus and Folkman (1986), the stress response can go in two directions: positive (When stimulates healthy coping, also called *Eustress*) or negative (when is the answer beyond the control of the person or Stress). There is evidence that the nursing professional, is vulnerable to suffer work-related stress, per the requirement of the specialised service for the care of the lives of others, as well as the constant contact with the pain and death of their patients and other administrative issues (Brown, Hudak, Horn, Cohen, Reed, Zimmerman and THRIVE Research, 2016; Llapa-Rodrigues, Marques, Lopes-Neto, López-Montesinos y Amado de Oliveira, 2016; Najimi, Goudarzi y Sharifirad, 2012; Pahlavanzadeh, Asgari and Alimohammadi, 2016). In this way, if the evaluation between the demands of work and coping capacity is perceived as staggering (Karasek, 1979), it can generate a reaction of stress that could be considered as an emerging pathology (International Labour Organization, 2010).

Its is reported that the conditions labor valued as stressors by the staff of nursing are mainly the lack of staff in the services, excessive workload for the allotted time, pain and suffering of the patients, conflict with the role and administrative activities (Cremades-Puerto, 2011; Enríquez, Colunga, Preciado, Ángel, and Domínguez, 2010). The Perceived Stress in these workers presents important consequences on the quality of attention to users and their own health, as well as the constant absenteeism and abandonment of the profession (Girbau, Galimany and Garrido, 2012), which affects job satisfaction (Souza, Costa, Hoffmeister, Souza de Negri, Pinherio and Poli, 2011).

Various studies indicate high prevalence of stress in the nursing professionals through *The Nursing Stress Scale (NSS*) in its version in Spanish. Thus, Cogollo and Gómez (2010)

concerned that 41% of surveyed 188 nursing professionals manifest stress stress by workplace conditions and lack of materials. In another study of 156 nursing professionals, Castillo, Torres, Ahumada, Cárdenas and Licona (2014) they report that 61% identify criticism from doctors and the workload as the main sources of stress. The women are those who mostly participate as nurses in hospital units and suffer from work-related stress due to the lack of appropriate conditions for their role (Garza et al 2011.; Pereira and Sousa, 2011) conditions.

Some studies related job stress of nurses with other variables, such as gender discrimination (female), high demands of relatives of patients, inadequate preparation or dissatisfaction with work (Kamal, Al-Dhshan, Abu-Salameh, Abuadas and Hassan, 2012); physical and psychological symptoms such as pain, insomnia, excessive sweating, palpitations, fatigue, frequent mood swings (Milutinovic, Golubovic, Brkic and Prokes, 2012); with labor issues as seniority, fixed contract or the general category nurse (Piñeiro, 2013); or burnout and job dissatisfaction (Porter and Vaquero, 2015).

The lack of uniformity within the meaning of work stress, as well as instruments that yield consistent indicators of registration, has made the diagnosis is diverse and inconclusive. Most scales measuring the construct are designed to Anglos, whose working conditions exceed those of developing countries. The scale "Nursing Stress Scale" developed by Gray-Toft and Anderson (1981) has adapted to Castilian (More and Escribà, 1998) with great acceptance in Latin American population, though not yet confirmed its factorial structure and cutoffs for Mexican population, as is done in other populations (Sakketou, Galanakis, Varfogli, Chrousos and Darviri, 2014).

The NSS in its original version (Gray-Tofl and Anderson, 1981) offers 34 items divided into seven dimensions according to factor analysis: death and suffering, conflict with physicians, inadequate preparation to cope with the emotional, lack of institutional support, conflict with nursing staff and supervisors, workload and uncertainty regarding treatment. While the Spanish version (Escribà, More, Cardenas and Perez, 1998) proposes nine factors (although the last three with one or two items): death and suffering, workload, uncertainty regarding treatment, problems with the hierarchy, insufficient preparation, lack of support, not knowing well the management and operation of specialized equipment, problems between nursing staff and temporarily move to

other services with staff shortages. Both proposals eventually consider the questionnaire as a single construct and qualify subject to the total sum.

According to these conditions, the objective of this study was to identify the factor structure of The Nursing Stress Scale (NSS) to estimate the level of work stress perceived by the nursing staff of a charity hospital in the city of Guadalajara, Mexico. The hypothesis was proposed that factor analysis would result in a small number of dimensions with psychometric strengths.

Method

Ethical considerations

The protocol for this study has record of the committees Evaluation and Ethics (CI-1308) of the University of Guadalajara. The research was carried out under informed consent and voluntary participation of nursing staff with permanent contracts. Work was done in compliance with the General Regulations of the General Law of Health in Research for Health in Mexico (RLGS, 1986) and the Declaration of Helsinki (2003).

Participants

A cross-sectional analytical study was conducted with the participation of 164 nurses of a charity hospital in the city of Guadalajara, Mexico, with final contract during 2013-2014. The selection was by census. We contacted the staff working in the area and was removed from the list after three visits who are not located. Thus 97% stake was obtained.

Instruments

The Nursing Stress Scale was used in the Spanish version of Escribà et al. (1998), consisting of 34 items, which identify situations potentially causes of stress for nurses working in hospitals. The scale offers four categories of response: never (0), once (1) often (2) and very often (3). Also it shows good correlation (.34) with the General Health Questionnaire Goldberg (version of 28 items) and the Health Questionnaire SF (-.31 -.21 and) Spanish version of 36 items. death and suffering, workload, uncertainty regarding treatment, problems with the hierarchy, lack of training, lack of support, not knowing well the management and operation: the Alfa Cronbach between 49-92 for the nine subscales reported specialized equipment, problems between nursing staff and temporarily move to other services with staff shortages.

Process

Once the permits were obtained by the hospital authorities to implement research, list of nursing area workers with permanent contracts assigned to locate in the area were asked. Participants were given questionnaires research, after respondents give their signed consent.

The descriptive statistical analysis was performed for the socio-labor variables. Factor analysis was performed by the method of principal components and varimax rotation with Kaiser criterion (eigenvalue greater than unity) to determine the dimensions; to choose the items that constitute each latent variable factor loadings were considered equal to or greater than .35 (ensuring explained and shared among the factors decreasing order of variance). Subsequently, for the study of specific dimensions data with the Maximum Likelihood method and Promax rotation, in order to estimate the stress level of those surveyed by the coefficients of the factor structure were analyzed. Data were treated with the IBM-SPSS (version 19, USA) software under license university.

Results

The socio-demographic variables reported that 5% (9) of the respondents were male and 95% (155) of the female. The average reported age of 40 (± 8.4) years; 59% (97) reported being married; 33% (55) single and 8% (12) live in free union. Participants indicated have the function of auxiliary nurses (25%), general nurses (59%) and specialty (16%). The length of service was 14 (± 8.4) years on average. It should be emphasized that 14% (23) said formally study in their spare time, while 20% (34) said they have other paid work.

The index of sampling adequacy Kaiser-Meyer-Olkin (KMO) was 0.836 and Bartlett's test of sphericity ($p < .001$) indicated relevance of the factor analysis.

four factors that explain 47.35% of variance were obtained. Table 1 shows the total variance was reported, whose saturation to the square of the rotation indicates a balanced distribution between the factors.

Table 1
Total variance of the explained Nursing Stress Scale

Componente	*Autovalores* iniciales			Sumas de las saturaciones al cuadrado de la extracción			Suma de las saturaciones al cuadrado de la rotación		
	Total	% de la varianza	% acumulado	Total	% de la varianza	% acumulado	Total	% de la varianza	% acumulado
1	10.04	29.528	29.528	10.04	29.528	29.528	4.689	13.791	13.791
2	2.229	6.557	36.085	2.229	6.557	36.085	4.591	13.503	27.294
3	2.067	6.079	42.165	2.067	6.079	42.165	3.655	10.749	38.043
4	1.764	5.19	47.354	1.764	5.19	47.354	3.166	9.312	47.354

Método de extracción: Análisis de Componentes principales.
N = 164

The rotated component matrix composed with four defined factors showed items whose value *eigen* He was above .35. As shown in Table 2, there are shared in two or more dimensions factor loadings; however, the theoretical content of the items, determined his selection for a specific component, respecting the highest factor loading.

Table 2
Matrix components *rotados*[a], Scale for Nursing Job Stress

	Componente			
	1	2	3	4
12. Muerte de un paciente con quien has llegado a tener una relación estrecha.	.630			
18. No disponer de una contestación satisfactoria a una pregunta hecha por un paciente.	.630			
19. Tomar una decisión sobre un paciente cuando el médico no está disponible.	.625	.424		
25. Personal y turno imprevisible.	.605			
27. Realizar demasiadas tareas que no son de enfermería (Ej.: tareas administrativas).	.561	.542		
15. Sentirse insuficientemente preparado para ayudar emocionalmente a la familia del paciente.	.516			.458
11. No tener ocasión para compartir experiencias y sentimientos con otros compañeros (enfermeras/os y/o auxiliares de enfermería) del servicio.	.507			
10. Miedo a cometer un error en los cuidados de enfermería de un paciente.	.503			
13. El médico no está presente cuando un paciente se está muriendo.	.500			
20. Pasar temporalmente a otros servicios con falta de personal.	.483			
23. Sentirse insuficientemente preparado para ayudar emocionalmente al paciente.	.442		.390	
2. Recibir críticas de un médico.		.719		
5. Problemas con un superior.		.670	.397	
3. Realización de cuidados de enfermería que resultan dolorosos a los pacientes.	.365	.628		
30. No tener tiempo suficiente para realzar todas mis tareas de enfermería.	.371	.569	.409	
17. Recibir información insuficiente del médico acerca del estado clínico de un paciente.		.568		
16. No tener ocasión para expresar a otros compañeros (enfermeras/os y/o auxiliares de enfermería) del servicio mis sentimientos negativos hacia los pacientes (Ej.: pacientes conflictivos. hostilidad, etcétera).	.399	.565		
4. Sentirse impotente en el caso de un paciente que no mejora.	.225	.515		
28. No tener tiempo suficiente para dar apoyo emocional al paciente.		.462		
1. Interrupciones frecuentes en la realización de sus tareas.		.444		
22. Dificultad para trabajar con uno o varios compañeros (enfermeras/os y/o auxiliares de enfermería) de otros servicios.			.636	
29. Dificultad para trabajar con uno o varios compañeros (enfermeras/os y/o auxiliares de enfermería) del servicio.			.617	
33. No saber bien el manejo y funcionamiento de un equipo especializado.			.611	
32. No saber qué se debe decir al paciente o a su familia sobre su estado clínico y tratamiento.			.607	
24. Recibir críticas de un supervisor.			.583	
31. El médico no está presente en una urgencia médica.	.364	.396	.518	
26. El médico prescribe un tratamiento que parece inapropiado para el paciente.		.423	.512	
34. Falta de personal para cubrir adecuadamente el servicio.			.356	

8. La muerte de un paciente.			.665
7. No tener ocasión para hablar abiertamente con otros compañeros (enfermeras/ os y/o auxiliares de enfermería) del servicio sobre problemas en el servicio.			.625
14. Estar en desacuerdo con el tratamiento de un paciente.			.591
6. Escuchar o hablar con un paciente sobre su muerte cercana.		.383	.581
21. Ver a un paciente sufrir.	.394		.453
9. Problemas con uno o varios médicos.			.387

Método de extracción: Análisis de componentes principales. Con rotación: Normalización Varimax de Kaiser.
[a] La rotación converge en 20 iteraciones.

Since the factor analysis Principal Component threw items that interacted on two factors, we proceeded to perform the analysis with the method of Maximum Likelihood, which provides estimates most likely on correlations for the specific dimension, and also the matrix structure factorial allows you to use the coefficients to classify subjects under the standard distribution. confirmation four rotation factors Promax requested, the Kappa value accepting four points as suitable for analysis.

The results showed the same values of adequacy, sphericity and that prior cumulative variance analysis. The matrix configuration is reported with five items located on two factors (Table 3). The items that meet the location criteria were renamed as follows:

The first factor labor efficiency that involves the perception of stressors related to the role of nursing within a hospital, the care with patients and their preparation in the therapeutic management was called.

The second factor was established with the items that identify stressors related to the death and suffering of patients.

The third factor was designated professional relationship since the items refer to criticism of their supervisors and physicians regarding their function or service.

The fourth factor was named as emotional interaction as it involves stressors related to feelings associated with patients and other staff working in their environment.

Table 3
Matrix configuración[a] Scale for Nursing Job Stress

	Componentes o Factores			
Ítems	1-Eficiencia laboral	2-Muerte-sufrimiento	3- Relación profesional	4- Interacción emocional
NSS_19	.799			
NSS_27	.722			
NSS_18	.714			
NSS_12	.566			
NSS_28	.494			
NSS_25	.490			
NSS_3	.487		.419	
NSS_11	.479			
NSS_15	.479	.432		
NSS_16	.468			
NSS_13	.459			
NSS_30	.446			
NSS_20	.420			
NSS_23	.416			
NSS_10	.385			
NSS_1	.332			
NSS_34	.286			
NSS_7		.561		
NSS_8		.543		
NSS_6		.502	.402	
NSS_14		.461		
NSS_21		.375		
NSS_9		.339		
NSS_2			.799	
NSS_5			.665	
NSS_17			.403	
NSS_4			.384	
NSS_22				.681
NSS_29				.658
NSS_33				.448
NSS_24				.447
NSS_26				.439
NSS_32				.427
NSS_31	.364			.386

Método de extracción: Máxima verosimilitud, con rotación: Normalización Promax de Kaiser.
[a] La rotación converge en 13 iteraciones.

Reliability factors calculated with the coefficient Alfa de Cronbach (table 4).

Table 4
Reliability and descriptive statistics of Work Stress Scale for hospital nursing staff

Factor	Alfa de Cronbach	Media	Desviación Típica	Elementos
Eficiencia laboral	.874	15.27	7.56	14
Muerte y sufrimiento	.684	6.02	2.87	6
Relación profesional	.681	4.44	2.41	4
Interacción emocional	.788	6.18	3.56	7

The rating of the participants is determined by the input coefficients, distributed standard values, mean zero and standard deviation (1). After participants are classified according to their score: low level (< -1); medium level (-1 a 1) and high level (> 1) (table 5).

Table 5
Rating nurses in the level of job stress

	Bajo		Medio		Alto		Total	
	n	%	n	%	n	%	n	%
Eficiencia laboral	16	10	121	74	27	16	164	100
Muerte y sufrimiento	21	13	126	77	17	10	164	100
Relación profesional	19	12	128	78	17	10	164	100
Interacción emocional	24	15	119	73	21	13	164	100

Discussion

The results of this research determined the factor structure of the Occupational Stress Scale for Nursing (The Nursing Stress Scale) in Mexican population. It is stated that value generated potentially stressful situations in hospital environments. In this investigation the 34 items that constitute the original scale were distributed into four factors, which we call labor efficiency, death / suffering, professional relationship and emotional interaction.

The factorial structure of this study differs from Spanish adaptation by Type et al. (1998) and original (Gray-Toft & Anderson, 1981). Mainly due to the inconsistency of items 3, 4, 7, 9, 12, 13 and 14, which theoretically are linked in different dimensions and can form the only variance according to the mathematical principle of factor analysis. However, the structure of the latent variables proposed in this study indicated that complies with the general principles: factors with three or more items with factor loadings above .30 and appropriately weighted distribution of variance explained.

The score obtained reliability of the factors was similar to the original and the Spanish adaptation, except that in this study exceeded the Spanish version since dimensions with more than three items (principle of factor analysis) were reported. The more variance factor involved own work demands, workload, role performance and organizational structure as demonstrated by other studies (Cremades-Port, 2011; 2010 Enríquez et al.). The percentage of affected nursing staff at a high level in this study was lower than reported by Cogollo and Gomez (2010) and Castillo et al. (2014), possibly differ cutoffs. However, this research is considered closer to the reference group and that obtained by standard values obtained with factor loadings.

It is likely that the average score (± standard deviation) obtained in this examination is a diagnostic indicator for job stress in nurses from other populations, although the authors of the original, as well as the Spanish adaptation, suggest that extrapolation is made with extreme caution.

One of the strengths of this study is the proportional distribution of participants according to the workshift, because by census have some certainty that the population was similar to that of other hospitals in the region. However, one of the weaknesses of research represents the size of the sample itself, since theoretically it is suggested that to confirm the factorial structure of a test

should be studies with large samples (20 per item). They could be confounding variables in this study were not recorded, such as personal characteristics or life events.

Future research may corroborate the validity of this scale with the simultaneous evaluation of other instruments or interaction of other variables such as physical, chemical, biological or ergonomic risks to which it is exposed nurses.

Conclusion

This study reported that the Nursing Stress Scale (NSS) to identify the perception of stress in hospital workers has construct validity. Also, the ease of administration and required little time can be used as a tool for reliable and timely an element of psychosocial risk at work diagnosis. In this way, the professionals caring for prevention in emerging risks may implement organizational or individual interventions in order to avoid or control the adverse effects of stress caused by labor issues.

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