

Emotional intelligence in nurses: the *Trait Meta-Mood Scale*

Inteligência emocional em enfermeiros: a escala *Trait Meta-Mood Scale*

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Abstract

Objective: In this context, the goal of our study is double. First to explore the psychometric properties of the TMMS-24 in a sample of Spanish nurses and second to provide some percentiles for interpreting EI levels in Spanish nurses.

Methods: A correlational descriptive study design was used to evaluate the psychometric properties of the TMMS-24. This study was conducted in a sample of 530 nurses from 11 Spanish hospitals from the Valencian Community. The inclusion criteria were nurses with active employment status (temporary, interim, or permanent positions) at the selected centres who had previously given their informed consent to participate. The age of the participants ranged from 22 to 64 years ($M=44.13$; $SD=11.58$), 75.6% were women (401), 53.8% (285) had a permanent position, 28.4% (151) were substitutes, and 17.8% (94) had a temporary contract. The statistical analysis was conducted using SPSS (*Statistical Package for the Social Sciences*, Version 22) as well as EQS (*Structural Equation Modeling Software*, Version 6.2) and FACTOR.

Results: The results indicate that psychometric properties of the TMMS-24 are adequate and its use appears to be justified. Finally, percentiles for interpreting emotional intelligence levels in Spanish nurses are presented.

Conclusion: In conclusion, the instrument has several potential applications for nurse managers widely concerned about health work environment and nursing. First, the study supports the use of TMMS-24 in the Spanish nursing context. Second, the study also supports the use of TMMS-24 for assessing EI in nurses. Third, the assessment of current nursing practice from a perspective of self-report may lead to determine the training needs and to evaluate the effectiveness of training and interventions to improve EI. Fourth, the existence of the instrument and the percentiles facilitates the interpretation of scores and allows quick comparison with other samples of nurses.

Resumo

Objetivo: Nesse contexto, o objetivo desse estudo é duplo. Primeiro, almeja-se explorar as propriedades psicométricas da TMMS-24 em uma amostra de enfermeiros espanhóis e em segundo lugar fornecer alguns percentis para interpretar os níveis de IE em enfermeiros espanhóis.

Métodos: Um desenho de estudo descritivo correlacional foi utilizado para avaliar as propriedades psicométricas da TMMS-24. Este estudo foi realizado com uma amostra de 530 enfermeiros de 11 hospitais espanhóis da Comunidade Valenciana. Os critérios de inclusão foram enfermeiros ativos (temporário, interino ou permanente) nos centros selecionados que haviam previamente consentido em participar. A idade dos participantes variou de 22 a 64 anos ($\chi = 44,13$; $DP = 11,58$). 75,6% eram mulheres (401), 53,8% (285) eram funcionários permanentes, 28,4% (151) eram substitutos e 17,8% (94) tinham contrato temporário. A análise estatística foi realizada através do programa SPSS (*Statistical Package for the Social Sciences*, Versão 22), além dos programas EQS (*Structural Equation Modeling Software*, Versão 6.2) e FACTOR.

Resultados: Os resultados indicam que as propriedades psicométricas da TMMS-24 são adequadas e seu uso parece ser justificado. Por último, são apresentados percentis para interpretar os níveis de inteligência emocional em enfermeiros espanhóis.

Conclusão: Em conclusão, o instrumento tem várias aplicações potenciais para gerentes de enfermagem preocupados com o ambiente de trabalho de saúde e com enfermagem. Primeiro, o estudo apoia o uso da TMMS-24 no contexto de enfermagem na Espanha. Em segundo lugar, o estudo também apoia o uso da TMMS-24 para avaliar a IE em enfermeiros. Terceiro, a avaliação da prática de enfermagem atual, a partir de uma perspectiva de autoavaliação, pode determinar as necessidades de treinamento e avaliar a eficácia da formação e das intervenções para melhorar a IE. Em quarto lugar, a existência do instrumento e dos percentis facilita a interpretação das pontuações obtidas e permite uma rápida comparação com outras amostras de enfermeiros.

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Introduction

Emotional intelligence (EI) is a key skill for nurses in patient care, and it has important consequences for both, patients' therapeutic relationship⁽¹⁾ and the nurses themselves.⁽²⁾ EI allows nurses to recognise, understand and regulate emotions and those of others, to discriminate among them and to use this information to guide thoughts and actions.^(3,4)

This ability to regulate and understand the emotions has effects on physical and emotional well-being of nurses.^(5,6) It is positively related to lower levels of stress,⁽⁷⁾ greater organizational commitment⁽⁸⁾ and job satisfaction of professionals, decreasing levels of burn out⁽⁹⁾ and improving effective leadership behaviors.^(10,11) EI becomes very important in nurses, as they must be able to control their own emotions and correctly detect, interpret and handle the emotions of others, to identify the needs of the other person and to provide an individualized attention.⁽¹²⁾

These findings suggest a completely new approach for nurse managers to improve environments work regarding the quality and safety of patient care.⁽¹³⁾ EI not only promotes employees' emotional competence but also builds emotionally intelligent organizations.⁽¹⁴⁾

A model for assessing emotional intelligence in nursing

The ability model, developed by Mayer and Salovey,⁽³⁾ assumes that EI is a skill that involves three processes: perception, understanding and regulating emotions. This is one of the most used models for assessing emotional intelligence in a nursing context and with the most scientific support.⁽¹⁵⁻¹⁸⁾ To evaluate the EI considering this model the *Trait Meta-Mood Scale* (TMMS-24) was developed. Despite the fact that it has been used in different contexts,⁽¹⁹⁻²¹⁾ the studies in nursing are more reduced and have centred on students.⁽²²⁻²⁵⁾ These studies relate the levels of EI (TMMS-24) with different aspects such as death attitudes, depression, suicide risk and fear of death in nursing.⁽²³⁻²⁵⁾ Nevertheless, it has nev-

er been validated on Spanish nurses using confirmatory factor analysis (CFA).

In this context, the goal of our study is double. First to explore the psychometric properties of the TMMS-24 in a sample of Spanish nurses and second to provide some percentiles for interpreting EI levels in Spanish nurses.

Methods

Participants

The age of the participants ranged from 22 to 64 years ($M=44.13$; $SD=11.58$). 75.6% were women (401). 53.8% (285) had a permanent position, 28.4% (151) were substitutes, and 17.8% (94) had a temporary contract.

Measures

EI was evaluated using the TMMS-24 *Trait Emotional Meta-Mood Scale*, which was adapted and validated in Spain by Fernández-Berrocal.⁽²⁶⁾ The scale assesses meta-knowledge of three elements that constitute EI: (1) Emotional attention (8 items), which is the extent to which an individual tends to observe and think about his or her feelings and moods. (2) Emotional clarity (8 items), which evaluates one's understanding of his or her own emotional states, and (3) Emotional repair (8 items), which involves the individual's beliefs about the ability to regulate his or her feelings. All 24 items are scored on a scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). The TMMS subscales are reported to have adequate psychometric properties in previous studies (attention, $\alpha = 0.90$; clarity, $\alpha = 0.90$; repair, $\alpha = 0.86$),^(18,26) as well as in this study.

Data Collection

A correlational descriptive study design was used to evaluate the psychometric properties of the TMMS-24. This study was conducted in a sample of 530 nurses from 11 Spanish hospitals from the Valencian Community. The inclusion criteria were nurses with active employment status (temporary, interim, or permanent positions) at the selected

centres who had previously given their informed consent to participate. The data collection phase lasted from January 2016 to May 2016. The study has previously obtained the consent of the Research Ethics Committee of the University of Valencia, H1432032268924 and for each hospital. The completion of the instrument required approximately 15 minutes.

Data Analysis

The statistical analysis was conducted using SPSS (*Statistical Package for the Social Sciences*, Version 22) as well as EQS (*Structural Equation Modeling Software*, Version 6.2) and FACTOR.⁽²⁷⁾ First, the properties of the items were analysed. Subsequently, the internal validity of the questionnaire was analysed using exploratory and confirmatory factorial analysis. Then convergent validity was analysed using the results of the confirmatory factor analysis (CFA), while for discriminant validity, the average variance extracted test (AVE) was used.⁽²⁸⁾ The adequacy of

the CFAs was tested using the significance of chi-squared (χ^2) and of the robust Satorra-Bentler correction (S-B χ^2), and the coefficients of the robust indices of goodness of fit (the Non-Normed Fit Index (NNFI), the Comparative Fit Index (CFI), and the Incremental Fit Fix (IFI), values $\geq .90$ = good fit; the Root Mean-Square Error of Approximation (RMSEA) $\leq .08$ = good fit).⁽²⁸⁾ Finally, percentiles were calculated.

Results

Analysis of items

The properties of the items grouped in the original dimensions of the instrument were analysed. Table 1 shows the average of all the items, the standard deviation, the item-total correlation, and the Cronbach's alpha value if the item is deleted. The global reliability of the questionnaire and separated dimensions showed an acceptable coefficient.

Table 1. Analysis of the TMMS-24 items: Mean (M), standard deviation (SD), item-total correlation (r_{ix}), Cronbach's alpha if it eliminates the element ($\alpha-x$)

Complete questionnaire ($\alpha=0.81$)	M	SD	r_{ix}	$\alpha-x$
Emotional Attention: $\alpha=.81$				
1. Presto mucha atención a los sentimientos	4.22	0.84	0.46	0.80
2. Normalmente me preocupo mucho por lo que siento	3.96	0.93	0.51	0.79
3. Normalmente dedico tiempo a pensar en mis emociones	3.67	1.04	0.53	0.78
4. Pienso que merece la pena prestar atención a mis emociones y estado de ánimo	4.06	0.90	0.40	0.79
5. Dejo que mis sentimientos afecten a mis pensamientos	3.01	1.16	0.31	0.81
6. Pienso en mi estado de ánimo constantemente	2.44	1.14	0.48	0.80
7. A menudo pienso en mis sentimientos	3.13	1.07	0.46	0.78
8. Presto mucha atención a cómo me siento	3.10	1.16	0.44	0.78
Emotional Clarity: $\alpha=.87$				
9. Tengo claros mis sentimientos	3.96	0.99	0.35	0.86
10. Frecuentemente puedo definir mis sentimientos	3.79	0.98	0.46	0.85
11. Casi siempre sé cómo me siento	3.87	0.96	0.51	0.85
12. Normalmente conozco mis sentimientos sobre las personas	3.94	0.88	0.41	0.86
13. A menudo me doy cuenta de mis sentimientos en diferentes situaciones	3.91	0.90	0.37	0.86
14. Siempre puedo decir cómo me siento	3.56	1.01	0.48	0.85
15. A veces puedo decir cuáles son mis emociones	3.75	0.97	0.40	0.86
16. Puedo llegar a comprender mis sentimientos	3.88	0.94	0.46	0.85
Emotional Repair: $\alpha=.85$				
17. Aunque a veces me siento triste, suelo tener una visión optimista	3.85	1.10	0.46	0.83
18. Aunque me sienta mal, procuro pensar en cosas agradables	3.94	1.00	0.62	0.81
19. Cuando estoy triste, pienso en todos los placeres de la vida	3.43	1.14	0.43	0.83
20. Intento tener pensamientos positivos aunque me sienta mal	3.88	.99	0.58	0.82
21. Si doy demasiadas vueltas a las cosas, complicándolas, trato de calmarme	3.87	1.00	0.33	0.83
22. Me preocupo por tener un buen estado de ánimo	4.05	0.96	0.36	0.84
23. Tengo mucha energía cuando me siento feliz	4.48	0.76	0.21	0.85
24. Cuando estoy enfadado (enojado), intento cambiar mi estado de ánimo	3.95	0.89	0.33	0.83

Validity

After analysing the item properties, the internal validity of the instrument was verified using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The Kaiser-Meyer-Olkin (KMO=0.89) index and Bartlett's sphericity ($\chi^2=4316.9$; $df=231$; $p \leq 0.001$) were adequate, enabling the EFA and the CFA to be performed.

The EFA was performed according to the process recommended by Lloret-Segura using the unweighted least-squares method, the parallel analysis, and normalised direct Oblimin rotation. It was necessary to eliminate two items because they presented saturations lower than 0.40: item 1 and item 23. The EFA fixed to the three factors considers 22 items which present an adequate fit (RMCR =0.45 (<0.50); GFI index of 0.98 (>0.95)) and explains 53.56% of variance. Then we proceed with the CFA.

The initial model, which was composed of 22 items, did not show a good fit (S-B χ^2 (df)=702.77 (206); χ^2 (df) = 995.66 (206); RMSEA (CI) = .073 (0.67-.079); CFI = .83, NNFI = .81, IFI =.84). After the elimination of three items (5, 6 & 22), a 19 items model with good fit was obtained (S-B χ^2 (df)= 370.20 (149); χ^2 (df) = 533.11 (149); RMSEA (CI) = .057 (0.050-0.065); CFI = 0.91, NNFI = 0.90, IFI =.91; Emotional Attention: Confidence Interval of Cronbach's Alpha (CI α) = 0.80 (0.77-0.83), CR = 0.80, AVE = 0.45; Emotional Clarity: CI α = 0.87 (0.85-0.89), CR=0.87, AVE = 0.46; Emotional Repair: CI α = 0.85 (0.82-0.87), CR = 0.85, AVE = 0.49).

In addition, convergent and discriminant validity appeared adequate because the scale items were significantly correlated with their latent variables, the T values oscillated from 7.93 to 17.29 ($t > 1.96$) and were significant at the 0.05 level, and the AVE square root was higher than the correlation among the pairs of factors or dimensions (Table 2).

Table 2. Matrix of interfactorial correlations and AVE values of the TMMS-24

Factors	F1	F2	F3
Factor 1- Emotional Attention	0.67		
Factor 2- Emotional Clarity	0.38**	0.68	
Factor 3- Emotional Repair	0.24**	0.53**	0.70

** $p < 0.01$; square root of the AVE in the diagonal

EI levels in Spanish nurses

Regarding the EI of nurses, the dimension referring to clarity of feelings showed the highest score ($M = 3.84$; $SD = 0.69$), while the dimensions related to mood repair emotional reparation ($M = 3.82$; $SD = 0.77$) and attention to feelings ($M = 3.58$; $SD = 0.77$) showed lower averages.

Percentiles for interpreting EI levels in Spanish nurses

Finally, to facilitate the interpretation of the data obtained from the TMMS-24 on nurses, the 10, 20, 30, 40, 50, 60, 70, 80, and 90 percentiles were calculated considering the entire sample and as a function of gender (Table 3).

Table 3. Percentiles for interpreting EI levels

EI levels	Total			Women			Men		
	F1	F2	F3	F1	F2	F3	F1	F2	F3
10	2.6	3	2.83	2.6	3	2.83	2.6	2.87	2.66
20	3	3.25	3.16	3	3.25	3.16	3	3.37	3.2
30	3.2	3.50	3.50	3.2	3.5	3.33	3	3.5	3.5
40	3.4	3.62	3.66	3.4	3.62	3.66	3.4	3.75	3.66
50	3.6	3.87	3.83	3.6	3.87	3.83	3.6	3.87	3.83
60	3.8	4	4	3.8	4	4	3.8	4	4.16
70	4	4.12	4.33	4	4.12	4.33	4	4.22	4.20
80	4.2	4.50	4.5	4.2	4.37	4.66	4.20	4.5	4.50
90	4.6	4.87	4.83	4.6	4.87	4.83	4.68	4.75	4.90

F1 - Emotional Attention; F2 - Emotional Clarity; F3 - Emotional Repair

Discussion

The EI is a key skill for nurses because it has important benefits for nurses and patients themselves, it has been related with well-being^(5,6) and reduced job-stress,⁽⁷⁾ levels of burn out⁽⁹⁾ and effective leadership.^(10,11) One of the most used instruments to measure EI in a different context is the TMMS24,⁽¹⁹⁻²¹⁾ also in a nursing context,^(15-18,23-25) although it has never been validated on Spanish nurses using CFA. That's why one of the aims of this study was to test the psychometric properties of the TMMS-24 in nurses and to present percentiles for interpreting EI in the Spanish nursing context. The findings revealed that TMMS4-24 allows a valid and reliable measurement of EI in nurses. The result of the EFA was a three-factor model that accounted for 53.56% of the variance according to the structure proposed by the original authors.⁽²⁶⁾ Regarding the CFA,

to achieve a good model fit, five items were eliminated from the final model. In this manner, the final model of the TMMS-24 was composed of 19 items distributed into three dimensions: attention (5 items), clarity (8 items), and repair (6 items), as well the original structure.^(18,26) The scale also presents adequate convergent and discriminant validity. Similarly, in reference to the analyses of reliability these results are adequate and similar to those obtained in other studies.^(5,18,26)

The results also indicate that nurses have a medium level of EI. Regarding the factors of the TMMS-24, dimensions related to emotional clarity ($M = 3.84$; $DT=0.69$) and emotional repair ($M = 3.82$; $DT = 0.77$) are the most present in nurses, followed by attention ($M = 3.58$; $DT = 0.77$), presenting medium levels in all them. These lower levels on emotional attention dimension seem to be in line with previous studies,⁽¹⁷⁻¹⁹⁾ that suggest medium levels of attention to feelings are indicative of greater emotional efficiency. All these results seem to be similar with other published studies that used the same instrument, where nurses had medium levels in all dimensions, attention, clarity and repair,^(17,18) although the referenced studies use smaller samples.

Finally, an analysis was performed to determine percentiles for interpreting EI levels in Spanish nurses, considering the entire sample and as a function of gender. There are no other criterial values of TMMS-24 on nurses, so they are very important as they allow us to interpret results as well as detect possible areas for improvement. Despite the importance and novelty of the research several limitations were present in this study. The non-probabilistic sampling and the origin of the subjects (exclusively from the Valencian Community), would make it interesting to extend this study to other populations in Spain and in other Spanish-speaking countries. Another limitation is related to the use of self-reports to gather data; although self-reports are a typical tool in research, they can introduce bias through the phenomenon of social desirability.^(29,30) Therefore, it would be advisable to combine the results with other external objective measures. Hence, all of these limitations should be considered in future research.

Nevertheless, the research seems to be specially interesting as it presents a validation of TMMS-24 on Spanish nurses, and offers criterial values to interpret nurse EI considering a huge sample. Nurse managers can use TMMS-24 analyse the work situation and improve work environments, to increase the levels of emotional clarity and emotional repair and to decrease the levels of emotional attention, promoting benefits for nurses, patients and health organizations.

Conclusion

In conclusion, the instrument has several potential applications for nurse managers widely concerned about health work environment and nursing. First, the study supports the use of TMMS-24 in the Spanish nursing context. Second, the study also supports the use of TMMS-24 for assessing EI in nurses. Third, the assessment of current nursing practice from a perspective of self-report may lead to determine the training needs and to evaluate the effectiveness of training and interventions to improve EI. Fourth, the existence of the instrument and the percentiles facilitates the interpretation of scores and allows quick comparison with other samples of nurses.

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Collaborations

Giménez-Espert MC and Prado-Gascó VJ contributed conception and design, analysis and data interpretation, drafting the article or revising it critically for important intellectual content and final approval of the version to be published.

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