

# Measuring professional competencies of registered nurses and nursing students. A cross-sectional comparative study

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**Abstract.** *Background and Aim of the work:* Professional competence is essential in providing nursing care based on standards. This concept can be measured, among various instruments, with the Nurses' Professional Competence Scale Short Form (NPCS-SF). The main aim of this study was to explore the perceptions of Registered Nurses (RNs) and Student Nurses (SNs) of their competencies and investigate their differences in the development of nursing competencies using the Italian version of the Nursing Professional Competence Scale Short Form (NPCS-SF). *Methods:* A cross-sectional observational study design was accomplished. The research was based on a convenience sample of 328 RNs and SNs (response rate: 81.95%) recruited at the University of Our Lady of Good Counsel, Tirane, Albania and Tor Vergata University Hospital, Rome, Italy. *Results:* RNs averaged higher than SNs' ( $m = 86.11 \pm 9.53$  SD) in professional competencies development. The factor for which the mean was highest for RNs was 'ethics of nursing care' ( $m = 89.54 \pm 8.31$  SD). SNs scored the lowest in leadership and coordination of nursing care ( $m = 78.36 \pm 14.55$  SD). *Conclusions:* The factors that scored the highest and lowest on the scale were similar to the results of using NPCS-SF in other countries. The study results may indicate that specific training for RNs and SNs could be accomplished based on different competence factors that show low scores of the NPCS-SF. The NPCS-SF has also shown excellent reliability in the Italian context. Furthermore, these findings have implications for teaching competencies in educational institutions and further research. ([www.actabiomedica.it](http://www.actabiomedica.it))

**Key words:** nursing education, nurses' professional competence scale short form, observational study, professional competence, registered and student nurses.

## Background

The concept of competence has become an essential requirement in nursing education and practice (1). In recent years there has been a progressive transformation in nursing education at the European (EU) point due to the Bologna process, a joined development of the higher education system at the EU level, which has defined both university curricula and nursing competencies (2). The World Health Organization (WHO) (3,4) argues that nurses are a fundamental component of all healthcare systems worldwide; thus,

nurses' lack of professional competencies would adversely affect patient outcomes. The WHO delineated nurses' professional competence as a framework of skills that express knowledge, attitudes, and psychological elements produced by nursing and midwifery practices (5). Despite professional competence is an essential element in the delivery of nursing care (6) and refers to providing care based on professional standards (7), it does exist confusion in the reference literature about its definition, how it should be evaluated and implemented, and what specific competencies a modern nurse necessitates (8).

According to Nilsson (9), there is little consensus regarding the conceptual definition of professional competence in nursing practice. Indeed, the same authors have stated that nurses' professional competence and the acquisition of competencies are considered fundamental to the exercise of the profession, but the concept in nursing literature has not yet been clearly defined (9). Despite the lack of consensus, some essential elements of professional competence are implemented by nurses equally in practice and in their behaviour in different clinical settings (10).

Due to the increase in research-based knowledge and health care organisation, nursing care is constantly evolving; as a result, professional competence considerations have also transformed (11).

Nursing education is essential in training professionals to contribute to global health (12). The quality of national and international core nursing degree programmes must be constantly assessed to ensure that they meet the requirements of clinical environments and are appropriate for the development and transformation of society and healthcare systems (13). In each country, the health systems require nurses to have the appropriate knowledge to provide safe, high-quality patient care using the necessary competencies (14).

Although competencies requirements are defined in several international contexts, they have not been formally assessed to investigate whether nurses possess the required skills (13, 15). One reason for the slow progress in this area may be the absence of formal re-validation requirements of professional nursing competencies during nursing employment (16, 17). Lack of knowledge of nurses' competencies poses risks to the quality of care and patient safety (18).

There are different grading scales for assessing nursing competencies that have been developed in different countries, both for nursing students and nurses; some of these are the Nurse Competence Scale (NCS) (19), the Competency Inventory for Registered Nurses (CIRN) (20), the European Questionnaire Tool (EQT1 and EQT2) (21); and the Holistic Nursing Competence Scale (22). However, only a few of these tools evaluate evidence from a psychometric point of view in different cultural settings; instead, many authors have strongly argued that psychometric assessment should be accomplished every time a cultural adaptation is carried out in a specific national setting (23,24).

The scales described above measure generic competencies, while the Nurse Professional Competence Scale (NPCS) (9) measures professional competence as self-assessed by nurses and nursing students. The NPCS is based on specific nursing competencies requirements, as set out by both the guidelines developed by the Swedish National Council for Health and Welfare (25), the essential nursing competencies defined by (26) definitions and WHO (27) international standards.

The original NPCS scale included 88 elements across eight areas of expertise (9). The NPCS has been translated, validated, and used in several countries, such as Austria, Germany, Norway, Portugal, and Switzerland (28, 12); it has also been used in Australia (30) and Saudi Arabia (31) on both registered nurses (RNs) (32) and student nurses (SNs) (13).

In 2017, some of the same authors that developed the Nurse Professional Competence Scale (NPCS) (9) settled the Nurse Professional Competence Scale Short Form (NPCS-SF), consisting of 35 items, measuring six different areas of expertise: nursing care; value-based nursing care; medical and technical care; care pedagogy (e.g., education of patients, relatives, colleagues, and students); documentation and administration of nursing care and development; leadership and organisation of nursing care (28).

The NPCS-SF has been translated, validated, and used in Slovenia, China and Italy (29-30, 35).

This study aimed to explore the perceptions of RNs' and SNs' of their competencies and explore their differences in professional nursing competence development.

## **Aim**

To explore the perceptions of RNs and SNs of their professional competencies and investigate their differences in their development using the Italian version of the NPCS-SF (Authors).

## **Methods**

### *Study design*

A cross-sectional design was used to process data from the sample of RNs and SNs at a single time point.

The manuscript was written following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) protocol (33).

### *Sample and Participants*

A convenience sample from nursing degree courses at an Italian university in Tirane, Albania, Our Lady of Good Counsel, allowed SNs to be recruited while RNs were enrolled at Rome Tor Vergata University Hospital. Sample recruitment was accomplished between January and May 2021. The RNs were contacted through corporate mail. In particular, the authors distributed an invitation to participate in the study using the RN mailing list.

The variables collected from RNs and SNs included socio-demographic and NPCS-SF data. As criteria for inclusion, the SNs had to be enrolled in university courses, demonstrate full payment for university tuition, and have passed more than 80% of the overall university exams required by the university's nursing curriculum. Nurses who provided direct assistance to patients had to be employed full-time in clinical practice.

### *Instruments*

The NPCS has been translated, validated, and used in several countries, such as Austria, Germany, Norway, Portugal, and Switzerland (9, 7); it has also been used in Australia (30) and Saudi Arabia (31) on RNs (32) and SNs (13).

The NPCS-SF was translated from English to Italian in line with the cross-cultural linguistic recommendations of Beaton et al. (34).

The I-NPCS-SF is divided into four categories. The first category, *management of nursing documentation and pedagogical assistance* (F1; items 1–14), evaluates the perception concerning their management of nursing documentation and the pedagogical contribution nurses must develop and possess in clinical practice. The second category, *acts/medical and technical nursing assistance* (F2; items 15–23), evaluates the perception of the acts put into the care practice from a medical and a technical perspective. The third category, *leadership, and coordination of nursing care* (F3; items 24–29), assesses the development of

good leadership in coordinating care; this concept of leadership has become increasingly crucial in nursing over the years. The fourth category, *ethics of nursing care* (F4; items 30–35), considers perceptions of the impact of professional ethics on responsible behaviour and ethical professional practice on the quality of practice and how it can contribute to professional improvement.

The scale measures the abovementioned four areas of expertise on a 7-point Likert scale (To a very low degree = 1, To a low degree = 2, To a relatively low degree = 3, Neither high or low degree = 4, To a relatively high degree = 5, To a high degree = 6 and, To a very high degree = 7).

Each factor of the I-NPCS-SF has a score calculated using a formula application and the results of each factor for the areas of expertise. Raw scores of the items in a factor are summarised, divided by the highest possible score, and multiplied by 100.

### *Data analysis*

SPSS statistical software for Windows, version 24 (SPSS Inc., Chicago, USA) was used to analyse the data. Descriptive statistics, including means and standard deviations (SDs), frequency and percentage, were calculated. Inferential statistics, the independent sample *t*-test and one-way analysis of variance (ANOVA) were used to analyse the means between the groups. An independent sample *t*-test was used to compare the mean professional competence in dual-mode qualitative variables (gender and role). A one-way ANOVA was used to compare the mean professional competence in multi-mode qualitative variables (age groups). Pearson's correlation coefficient was calculated to evaluate the relationships between the factor scores of the I-NPCS-SF to assess whether the sample examined showed that they had the appropriate professional competencies based on their development process from SNs to RNs. A *p*-value of less than 0.05 was considered statistically significant. The internal consistency of each area of expertise and the total scale were calculated using Cronbach's alpha. Missing values were replaced with the obtained mean of the missing items.

### Ethical considerations

The Italian version of the NPC-SF (35), used in our study, has obtained the concession for its use by this research group, who has been previously contacted, through e-mail, by the first author of this article. The study was designed, conducted, registered, and reported consistently with the international ethical and scientific quality standards indicated by good clinical practice (GCP) and standard operating procedures (SOP). All participants were voluntarily involved and fully informed of the study's purpose. They were asked to provide written informed consent. The consent was provided in paper format and returned to the researchers before participating in the study. Participants were also informed of the confidentiality and anonymity of their responses during the data collection and analysis processes. All health care professionals were invited to participate anonymously after reading a fact sheet explaining the purpose of the study, the risks and benefits of the study and the rights of the participants. This study was ethically approved by the Centre of Excellence for Nursing Scholarship OPI Rome protocol number 2.21.28.

### Results

Using a snowballing method, a convenience sample of 449 registered nurses was recruited to participate in the study. The questionnaire was completed by 328 of 449 participants (response rate: 73.05%). The sample size was calculated based on a 95% confidence level with a 5% margin of error. The ages of the participants ranged from 19–56 years (mean 25.9 years  $\pm$  6.33 SD). The majority were women (76.8%). Participants were divided into RNs 160 (48.8%) and SNs 168 (51.2) (Table 1).

Cronbach's alpha for the areas of expertise of the I-NPC-SF ranged from 0.86–0.93 and was 0.97 for the whole scale (Table 2).

The professional competencies of the sample seemed to follow the competencies development process supported by statistically significant correlations between the partial scores (Table 3).

If the analysed sample demonstrated the ability to have appropriate professional competencies, they also demonstrated the appropriate competencies in the different stages of competence development from SNs to RNs.

**Table 1.** Socio demographic data (n=328)

		RN		SN		Total	
		N	%	N	%	N	%
<b>Gender</b>	<b>F</b>	128	80.0%	124	73.8%	252	76.8%
	<b>M</b>	32	20.0%	44	26.2%	76	23.2%
	<b>Total</b>	160	100.0%	168	100.0%	328	100.0%
<b>Age Classes</b>	<b>&lt;20</b>	0	0.0%	58	34.5%	58	17.7%
	<b>21-30</b>	103	64.4%	106	63.1%	209	63.7%
	<b>31-40</b>	47	29.4%	3	1.8%	50	15.2%
	<b>&gt;40</b>	10	6.3%	1	0.6%	11	3.4%
	<b>Total</b>	160	100.0%	168	100.0%	328	100.0%

**Table 2.** Cronbach's Alpha of the I-NPC-SF for factors (F) and total scale

Factor		Cronbach's Alpha
I-NPC-SF		
Management of the documentation of nursing and pedagogical assistance	<b>F1</b>	0.86
Acts/Medical and technical nursing assistance	<b>F2</b>	0.86
Leadership and coordination of nursing care	<b>F3</b>	0.92
Ethics of Nursing Care	<b>F4</b>	0.93
Total		0.97

**Table 3** Self-assessment of the Factors of the I-NPCS-SF of RNs and SNs (*t*-test)

								95% Confidence Interval of the Difference	
Factor I-NPCS-SF	Nurse Role	N	Mean	SD	F	p-value	t	Lower	Upper
F1	RN	160	86.59	10.003	0.950	0.331	1.775	-0.230	4.480
	SN	168	84.46	11.576					
F2	RN	160	85.92	10.555	0.034	0.855	1.912	-0.067	4.717
	SN	168	83.60	11.422					
F3	RN	160	82.40	12.266	1.507	0.220	2.709	1.106	6.968
	SN	168	78.36	14.556					
F4	RN	160	89.54	8.313	5.105	0.025	1.941	-0.027	4.019
	SN	168	87.54	10.168					
Total Mean	RN	160	86.11	9.533	1.010	0.316	2.336	0.414	4.828
	SN	168	83.49	10.716					

**Table 4.** Self-assessment of the Factors of the I-NPCS-SF and Gender (*t*-test)

								95% Confidence Interval of the Difference	
Factor I-NPCS-SF		N	Mean	SD	F	p-value	t	Lower	Upper
F1	F	252	85.49	11.094	2.588	0.109	-0.024	-2.838	2.768
	M	76	85.53	10.176					
F2	F	252	84.73	11.328	2.731	0.099	-0.019	-2.877	2.821
	M	76	84.75	10.156					
F3	F	252	79.63	14.251	4.018	0.046	-1.696	-6.510	0.481
	M	76	82.64	11.037					
F4	F	252	88.87	9.091	1.269	0.261	1.249	-0.878	3.931
	M	76	87.34	10.133					
Total Mean	F	252	84.68	10.559	3.755	0.054	-0.289	-3.023	2.248
	M	76	85.07	9.089					

Regarding the differences between the scores obtained with the administration of the I-NPCS-SF, the *t*-test did not show significant differences between the scores of RNs (mean = 86.11; SD = 9.533; confidence interval [CI = 0.414 ± 4.828; p = 0.316] and SNs (mean = 83.49; SD = 10.716); confidence interval [CI = 0.414 ± 4.828; p = 0.316] (Table 3). RNs had the highest scores and showed significantly different scores from SNs for factors of the I-NPCS-SF, particularly for F4 (*ethics of nursing care*) (p = 0.025).

The differences between the scores of the *t*-test regarding gender, in this case, did not show significant

differences between the total mean scores of the female gender (F, mean = 84.68; SD = 10.559; CI = -3.023 ± 2.248; p = 0.054) and male gender (M, mean = 85.07; SD = 9.089; CI = -3.023 ± 2.248; p = 0.054) (Table 4). Only one factor of the four categories of I-NPCS-SF showed significance, most notably F3 (*leadership and coordination of nursing care*) (p = 0.046) (Table 4).

With reference to the four categories, the ANOVA did not show significant differences in relation to age groups (age <20, mean = 82.35; SD = 9.786; CI = 79.781 ± 84.927; age 21–30; mean = 85.31; SD = 10.513; CI = 83.873 ± 86.740; age 31–40; mean

**Table 5.** Self-assessment of the Factors of the I-NPCS-SF and age classes (ANOVA)

Factor I-NPCS-SF	Age Classes	N	Mean	SD	95% Confidence Interval for Mean		F	p-value
					Lower	Upper		
F1	<20	58	83.73	10.653	80.925	86.527	0.651	0.583
	21-30	209	85.98	11.220	84.453	87.513		
	31-40	50	85.49	9.355	82.831	88.148		
	>40	11	85.71	12.194	77.522	93.906		
	Total	328	85.50	10.873	84.319	86.681		
F2	<20	58	83.25	9.925	80.642	85.861	0.505	0.679
	21-30	209	85.14	11.442	83.577	86.697		
	31-40	50	85.05	10.019	82.200	87.895		
	>40	11	83.41	14.115	73.923	92.888		
	Total	328	84.73	11.052	83.531	85.932		
F3	<20	58	76.35	12.817	72.985	79.725	2.343	0.073
	21-30	209	80.75	14.236	78.806	82.689		
	31-40	50	82.62	11.284	79.412	85.826		
	>40	11	82.90	12.636	74.412	91.389		
	Total	328	80.33	13.618	78.849	81.807		
F4	<20	58	86.08	10.683	83.275	88.893	2.140	0.095
	21-30	209	89.36	9.099	88.119	90.601		
	31-40	50	88.33	8.167	86.012	90.654		
	>40	11	86.15	10.147	79.330	92.964		
	Total	328	88.52	9.349	87.501	89.532		
Total Mean	<20	58	82.35	9.786	79.781	84.927	1.335	0.263
	21-30	209	85.31	10.513	83.873	86.740		
	31-40	50	85.37	8.896	82.844	87.901		
	>40	11	84.54	12.031	76.459	92.625		
	Total	328	84.77	10.225	83.658	85.880		

= 85.37; SD = 8.896; CI = 82.844 ± 87.901; age > 40; mean = 84.54; SD = 12.031; CI = 76.459 ± 92.625). Some factors of the I-NPCS-SF's four categories showed a slight significance, especially F3 (*leadership, and coordination of nursing care*) (p = 0.073) (Table 5).

## Discussion

This study explored the perceptions of Italian RNs and SNs regarding their professional competence using the I-NPCS-SF scale (33). In this investigation, the average professional competence of the RNs

[mean 86.11; SD 9.533] and SNs [mean 83.49; SD 10.716] was at a very good level. With its four factors, the I-NPCS-SF contained all six factors of the original NPCCS (9). The internal reliability of the subscales was good, and that of the overall scale was also excellent ( $\alpha = 0.97$ ). (Table 2)

Professional nursing competence, together with clinical competence, is one of the essential standards for ensuring the quality of care, and its analysis can lead to identifying areas of nursing that still require improvement and further teaching. The assessment of professional competence can be considered a fundamental predictor and influence the professional

development of nurses to provide safe, effective, and professional care.

The scores obtained by the four different factors ranged from 78.36–89.54 for both the RNs and SNs (Table 3) and were congruent with the results of using this tool in other countries (13, 30, 9, 7, 14).

Specifically, the factors for which RNs rated their competence to be highest were *ethics of nursing care* (F4 = 89.54) and *management of nursing documentation and pedagogical assistance* (F1 = 86.59). At the same time, those with the lowest ratings were *medical and technical nursing assistance acts* (F2 = 85.92) and *leadership and coordination of nursing care* (F3 = 82.40). The factors in which SNs rated their highest competence were *ethics of nursing care* (F4 = 87.54) and *management of the documentation of nursing and pedagogical assistance* (F1 = 84.46). Concomitantly, those with the lowest ratings were *leadership and coordination of nursing care* (F3 = 78.36) and *acts/medical and technical nursing assistance* (F2 = 83.60).

van de Mortel et al. (31), in their study, indicate that it would be appropriate to explore together the competencies of SNs with those of RNs; this could be useful in analysing the areas of competence with the lowest score for academic nurses as components to be addressed in nursing curricula. It would also be appropriate to assess the differences among RNs.

Specifically, regarding the professional competence of RNs and SNs, our results are in line with the results of several studies, which evaluated the professional competencies of nurses in Australia, China and Slovenia and showed that the professional competencies of RNs and SNs were above average (30, 29, 30).

This study suggests that ethics and management competencies are among the most relevant professional competencies for nurses in the current nursing and educational context and should be further explored, especially in some specific areas that are often overlooked, such as nursing care, adverse events, research, quality, and safety of care.

## Conclusion

The study results have implications for nursing care and education, research and management and clinical practice. The areas of competence with the

lowest scores highlighted for RNs and SNs have to be improved through continuous education. In fact, some specific training could be offered to RNs and SNs for the I-NPCS-SF factors that scored low. The I-NPCS-SF could also be used in further research nationwide or collaborative research with education providers, employers, and professional organisations worldwide. In terms of reliability, all areas of expertise and the whole scale have received good Cronbach's alpha values; hence, this investigation has further contributed to the validation of the NPCS-SF in Italy.

However, many challenges remain unclear within the concept of nursing competence, as this is a multi-dimensional, complex construct.

Limitations to the current study comprised the method of self-assessment by registered nurses and student nurses that could have influenced the study results by being self-referential. Besides, the study results may not be generalised to other contexts due to various external and internal factors affecting professional competencies. Besides, future research should better consider possible confounding factors and analyse them.

However, this is one of the first studies where professional competencies between RNs and SNs were compared, as advised by van de Mortel et al. (31).

**Conflict of Interest:** Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

## References

1. Blažun H, Kokol P, Vošner J. Research literature production on nursing competences from 1981 till 2012: A bibliometric snapshot. *Nurse Educ Today* 2015; 35(5): 673-9.
2. Rocco G, Affonso D, Caruso R, et al. Nursing in Albania: A catalytic force in transforming health professionals and health care. *J Nurs Scholar* 2021; 53(4): 479-89.
3. World Health Organization. The World Health Report 2006: working together for health. World Health Organization. Available from: <https://apps.who.int/iris/handle/10665/43432>. Accessed on June 07, 2022.
4. World Health Organization. State of the world's nursing 2020: investing in education, jobs and leadership. World Health Organization. Available from: <https://www.who.int/publications/i/item/9789240003279>. Accessed on June 07, 2022.

5. World Health Organization. Defining competent maternal and newborn health professionals: background document to the 2018 joint statement by WHO, UNFPA, UNICEF, ICM, ICN, FIGO and IPA: definition of skilled health personnel providing care during childbirth. Available from: <https://apps.who.int/iris/handle/10665/272817>. Accessed on June 07, 2022.
6. Lehane E, Leahy-Warren P, O’Riordan C, et al. Evidence-based practice education for healthcare professions: an expert view. *BMJ Evid-Based Med* 2019; 24(3): 103-08.
7. Ten Cate O. Competency-Based postgraduate medical education: Past, present and future. *GMS J Med Educ* 2017; 15, 34(5).
8. Notarnicola I, Petrucci C, De Jesus Barbosa MR, Giorgi F, Stievano A, Lancia L. Clinical competence in nursing: A concept analysis. *Prof Inf* 2016; 69(3): 174-81.
9. Nilsson J, Johansson E, Egmar AC, et al. Development and validation of a new tool measuring nurses self-reported professional competence—The nurse professional competence (NPC) Scale. *Nurse Educ Today* 2014; 34(4): 574-80.
10. Feo R, Kitson A, Conroy T. How fundamental aspects of nursing care are defined in the literature: A scoping review. *J Clin Nurs* 2018; 27(11-12): 2189-2229.
11. Karami A, Farokhzadian J, Foroughameri G. Nurses’ professional competency and organisational commitment: Is it important for human resource management? *PLoS One* 2017; 12(11): e0187863.
12. Nilsson J, Mischo-Kelling M, Thiekoetter A, et al. Nurse professional competence (NPC) assessed among newly graduated nurses in higher educational institutions in Europe. *Nordic J Nurs Res* 2019; 39(3): 159-67.
13. Gardulf A, Florin J, Carlsson M, et al. The Nurse Professional Competence (NPC) Scale: A tool that can be used in national and international assessments of nursing education programmes. *Nordic J Nurs Res* 2019; 39(3): 137-42.
14. Theander K, Wilde-Larsson B, Carlsson M, et al. Adjusting to future demands in healthcare: Curriculum changes and nursing students’ self-reported professional competence. *Nurse Educ Today* 2016; 37: 178-83.
15. Kleib M, Chauvette A, Furlong K, Nagle L, Slater L, McCloskey R. Approaches for defining and assessing nursing informatics competencies: a scoping review. *JBIM Evid Synth* 2021; 19(4): 794-841.
16. Blackburn J, Ousey K, Stephenson J. Nurses’ education, confidence, and competence in appropriate dressing choice. *Adv Skin & Wound Care* 2019; 32(10): 470-6.
17. Mlambo M, Silén C, McGrath C. Lifelong learning and nurses’ continuing professional development, a meta-synthesis of the literature. *BMC Nurs* 2021, 20(1): 1-13.
18. Karlsson AC, Gunningberg L, Bäckström J, Pöder U. Registered nurses’ perspectives of work satisfaction, patient safety and intention to stay—A double-edged sword. *J Nurs Manag* 2019; 27(7): 1359-65.
19. Meretoja R, Isoaho H, Leino-Kilpi H. Nurse competence scale: development and psychometric testing. *J Adv Nurs* 2004; 47(2): 124-33.
20. Liu M, Kunaiktikul W, Senaratana W, Tonmukayakul O, Eriksen L. Development of competency inventory for registered nurses in the People’s Republic of China: scale development. *Int J Nurs Stud* 2007; 44(5): 805-13.
21. Cowan DT, Wilson-Barnett J, & Norman IJ. A European survey of general nurses’ self assessment of competence. *Nurse Educ Today* 2007; 27(5): 452-8.
22. Takase M, Teraoka S. Development of the holistic nursing competence scale. *Nurs Health Sci* 2011; 13(4): 396-403.
23. Borsa JC, Damásio BF, Bandeira, DR. Cross-cultural adaptation and validation of psychological instruments: Some considerations. *Paidéia* 2012; 22: 423-32.
24. Lenz AS, Gómez Soler I, Dell’Aquila J, Uribe PM. Translation and cross-cultural adaptation of assessments for use in counseling research. *Meas Eval Couns Dev* 2017; 50(4): 224-31.
25. The National Board of Health and Welfare. Competence requirements for registered nurses. Stockholm. Sweden (Kompetensbeskrivning för legitimerad sjuksköterska. Socialstyrelsen, Stockholm, Sverige). 2017. Available from: <https://www.swenurse.se/download/18.9f73344170c003062317be/1584025404390/kompe%20tensbeskrivning%20legitimerad%20sjuksk%C3%B6terska%202017.pdf>. Accessed on June 07, 2022.
26. Cronenwett L, Sherwood G, Barnsteiner J, et al. Quality and safety education for nurses. *Nurs Outlook* 2007; 55(3): 122-31.
27. WHO. Global standards for the initial education of professional nurses and midwives. 2009. World Health Organization. Available from: [https://www.who.int/hrh/nursing\\_midwifery/hrh\\_global\\_standards\\_education.pdf](https://www.who.int/hrh/nursing_midwifery/hrh_global_standards_education.pdf). Accessed on June 07, 2022.
28. Nilsson J, Engström M, Florin J, Gardulf A, Carlsson M. A short version of the nurse professional competence scale for measuring nurses’ self-reported competence. *Nurse Educ Today* 2018; 71: 233-9.
29. Xu L, Nilsson J, Zhang, J, Engström M. Psychometric evaluation of Nurse Professional Competence Scale-Short-form Chinese language version among nursing graduate students. *Nurs Open* 2021, 8(6), 3232-3241.
30. Prosen M, Kvas A, Bošković S, Ličen S. Cross-cultural adaptation and psychometric evaluation of the Slovenian version of the nurse professional competence scale. *BMC Nurs* 2021, 20(1), 142.
31. van de Mortel TF, Nilsson J, Lepp M. Validating the Nurse Professional Competence Scale with Australian baccalaureate nursing students. *Collegian* 2021; 28(2): 244-51.
32. Halabi JO, Lepp M, Nilsson J. Assessing self-reported competence among registered nurses working as a culturally diverse workforce in public hospitals in the Kingdom of Saudi Arabia. *J Trans Nurs* 2021; 32(1): 69-76.

33. Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies. *Int J Surg* 2014; 12(12): 1495-99.
34. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine* 2000; 25(24): 3186-91.
35. Prendi E, Stievano A, Spada F, et al. Psychometric validation of the Nursing Professional Competence Scale among Italian nurses and nursing students. *J Nurs Measur* 2023. (in press)

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