

Evidence-Based Practice (EBP) implementation among nursing students: Italian validation of S-EBPQ.

Donato Longo¹, Alessio Gili², Noemi Ramacciati³, Rosita Morcellini^{2,4}, Nicola Ramacciati^{2,4}

¹Dipartimento di Emergenza e Accettazione, Ospedale Vito Fazzi, Lecce, Italy; ²Dipartimento di Medicina e Chirurgia, Università di Perugia, Italy; ³Dipartimento di Lettere, Lingue e letterature straniere, Università di Perugia, Italy; ⁴Direzione Formazione e Qualità, Azienda Ospedaliera S. Maria della Misericordia, Perugia, Italy; ⁵Dipartimento di Medicina e Chirurgia, Università di Perugia, Italy; ⁶Dipartimento di Medicina e Chirurgia, Università di Perugia, Italy; ⁷Dipartimento di Emergenza e Accettazione, Azienda Ospedaliera S. Maria della Misericordia, Perugia, Italy

Abstract. *Background and aim:* The use of Evidence-Based Practices in nursing has become essential for providing effective, safe, and personalized care. Nurses must learn the skill to use Evidence-Based Practice in universities, which represents the core of nursing education. Therefore, it appears necessary to evaluate students' learning after the training period and to identify the strengths and obstacles to the implementation of Evidence-Based Practice put to use. This study aims to validate the Italian version of the Student Evidence Based Practice Questionnaire. *Methods:* The questionnaire was translated into Italian according to the World Health Organization guidelines. Content validation was carried out. A study was conducted on a sample of 119 students. The questionnaire was administered at four different times during the training period. The data were evaluated using the ANOVA test for repeated measures, Cronbach's Alpha, and Pearson's Correlation Coefficient. *Results:* The Content Validity Index demonstrated values greater than 0.8 in all items and overall. Cronbach's Alpha showed values above 0.90 in the entire questionnaire. There was no correlation between the sex or age of the students and the score in the questionnaire. The mean scores gradually increased over the four administrations. *Conclusions:* The Student Evidence-Based Practice Questionnaire in the Italian version has proven to be a valid tool for assessing students' approach to Evidence-Based Practice.

Keywords: Evidence-Based Practice, nursing student, questionnaire, Italy

Introduction

The scientific research and the application of its results are now well established in nursing practice, as expressly emphasized also by the new Italian code of ethics for nurses (1). Today's challenge for nurses, as well as for all health professionals, is to offer effective, safe, and personalized care (2). The Evidence-Based Practice (EBP) allows to provide high-quality care, personalized for patients, based on the "here and now" principle (3), reduces costs, and ensures to keep pace with new technologies and skills (4,5). The knowledge obtained through the integration of clinician experiences, search results, and patient values (using Sack-

et's famous definition of EBM as far back as 1996) (6) can help nurses in their daily practice, especially in non-routine activities (7). Teaching the basics of EBP is fundamental to enable nurses to provide high-quality care, and it is important to pass on knowledge and build both skills and the attitude since the early years of university education for nurses (8). Of course, improving students' critical thinking skills about scientific evidence is a process that requires human and financial resources from universities, but it represents a starting point for the EBP use in future clinical situations (9). However, university education can help to promote the EBP application (10). Therefore, it is important to evaluate the level of competence reached by

students after a training period, to understand what are the variations that occur among students in the various aspects of EBP (knowledge, skills, aptitude), to produce evidence of teaching effectiveness itself and identify students' strengths and weaknesses regarding Evidence-Based Practice. A simple, inexpensive, easily applicable, and replicable method to achieve this goal is using a self-report questionnaire. To date, there are several validated tools specifically developed for nursing students for this purpose. However, many of these are focused mainly on some domains (e.g. knowledge or skills) or EBP steps (e.g. study evaluation), leaving out the other aspects (11). In a recent literature review carried out in the PubMed, Embase, and CINAHL databases, we highlighted that there are, to date, 13 different tools for assessing EBP (12). Among these, the most widespread are the Student Evidence-Based Practice Questionnaire (S-EBPQ) developed by Upton et al. (13) and the Evidence-Based Practice Evaluation Competence Questionnaire (EBP-COQ) designed by Ruzafa et al. (14). In Italy, a validation and linguistic-cultural adaptation of EBP-COQ was only recently published by Finotto and Garofalo (15). As stated by Italian researchers "content validity, the reliability of the internal consistency and the stability of reliability were sought. The criteria validation was not taken into account, because there are no specific standard instruments in the Italian context".(15, p.100). Therefore, it is useful to have more standard tools to measure EBP competence in Italian nursing students.

Aim of the study

The present study was conducted with the aim of carrying out the linguistic-cultural adaptation and validation of the Italian version of S-EBPQ.

Methods

Study design

A methodological study design was employed to translate the S-EBPQ into the Italian language and evaluate its validity and reliability.

Participants

Participants in this study were ten experts for the content validation of the Italian version of the S-EBPQ, 65 third-year students for facade validation, and 119 second-year students for the reliability assessment (Table 1.)

Instruments

The S-EBPQ is the revised version of the Evidence-Based Practice Questionnaire (EBPQ) developed by Dominic and Penney Upton in 2006 to measure the nurses' knowledge, skills, and attitude against the Evidence-Based Practice (16). The S-EBPQ consists of 21 items - as, in the validation study for nursing student adaptation, three of the original twenty-four were eliminated - divided into four subscales: *Retrieving and Reviewing Evidence* (7 items), *Frequency of Practice* (6 items), *Sharing and Applying EBP* (5 items), *Attitude* 3 (items). The Australian authors with a Principal Component Analysis demonstrated evidence for the S-EBPQ's construct validity. The explanatory power of the 4-factor model was 65%. The Convergent Validity was examined through a one-way between-groups MANOVA test, identifying significant differences between the average scores among nursing students of the three years of the Degree Course, notably, between students in years 1 and 3 ($p = .001$) and years 2 and 3 ($p = .007$) on the practice subscale, and between students of years 1 and 3 ($p = .012$) and of years 2 and 3 ($p < .001$) in the test recovery/revision subscale. Finally, Internal Reliability was measured through Cronbach's alpha, which was greater than 0.7

Table 1: Participants characteristics

Panel	Gender Male - Female n. (%)	Age (years) mean (SD)	Experience (years) mean (SD)	Total n.
Experts	6 (60.0) - 4 (40.0)	50.4 (9.3)	27.5 (7.8)	10
Students	17 (26.2) - 45 (73.8)	24.4 (5.4)	3 (0.1)	65
Students	29 (24.3) - 90 (75.7)	22.6 (4.3)	2 (0.0)	119

in all subscales.

The linguistic-cultural adaptation process

On 17 April 2019, the S-EBPQ authors authorized the use of their questionnaire for our study. The questionnaire was translated, according to WHO standards (17) from English to Italian by an Italian speaker, foreign languages and cultures graduate at the University of Perugia. After content validation steps, the Italian translation was subsequently back-translated by an English native speaker, Lecturer at the Nursing School of Perugia University, and collaborator at the Centro Linguistico di Ateneo (the University Linguistic Center of Perugia University). On 19 September 2019, the English lecturer sent the back-translation to the author of the S-EBPQ developer group. On 24 September 2019, Professor Penney Upton verified and confirmed the accuracy of the translation.

The validation process

The first Italian version of S-EBPQ was subjected to the content validation study to verify whether the questions adequately represented the concept's definition intended to convey (18,19). Following the approach proposed by Almanasreh and colleagues (20), a group of ten health experts was selected and asked to assess the relevance of the items, their clarity, and their definition. The questions in the questionnaire were evaluated by assigning a score ranging from 1 to 4 (1 = not relevant, 2 = not able to assess their relevance, 3 = relevant, but with small changes, 4 = relevant).

Moreover, it was administered to a sample of nursing students (third-year of Degree in Nursing) to assess its clarity, as suggested by Schiling and colleagues (21). Participants were asked to provide a dichotomous judgment - *Clear / Unclear* - for each item in the questionnaire.

Statistical methods

The data obtained were assessed by calculating the percentage, mean and standard deviation. The repeated measures ANOVA test was used to evaluate changes over time in S-EBPQ scores in the same group (22,23). As statistical significance, a probability of error of less than 5% was taken into account ($p < 0.05$). The internal consistency of the questionnaire was assessed through Cronbach's Alpha, considered the most used measure

to objectify the reliability of an instrument (24). In order to identify the presence of a correlation between the score obtained in the questionnaire and the age and sex of the students, the Pearson Correlation Index was calculated. Data were analyzed using Stata software.

Ethical considerations

The study was carried out with the approval of the Degree Course in Nursing of the University of Perugia.

Participation in the study was voluntary. The students' return of the completed questionnaire was considered as consent.

Results

The questionnaire assessments' results, done by the experts and third-year students, are shown in Tables 2 and 3.

The statistical analysis carried out on the data obtained from the questionnaire administration is shown in tables 4, 5, 6, 7, 8.

In the expert panel assessment, all questions in the tool scored 3 and 4, except for item 15 (Ability to determine how valid - close to the truth - the material is), and item 19 (Sharing ideas and information with colleagues) that received a score of 2 from one and two experts, respectively. To calculate the Item-Content Validity Index (I-CVI) has been assigned a value of 1 to 3-4 - provided by an expert panel - and a value of 0 to 1-2. These values have later been added and divided by the number of experts. The Scale-Content Validity Index/Universal Agreement (S-CVI/UA) has been calculated by attributing the value 1 to the items who have been judged from all experts with a score of 3 or 4, while the value 0 is attributed to the items who have been judged by at least one expert with a value of 1 or 2. The values obtained have been added up and divided by the number of items. Finally, the Scale-Content Validity Index/Average (S-CVI / Ave) has been calculated by dividing the sum of the I-CVI values by the number of items in the questionnaire.

The total score of the questionnaire in the first administration - considered the starting point of the study - showed an average in the results, over a range

Table 2: Content Validity Index scores

Subscale/item	I-CVI
Frequency of Practice	
1. Formulated a clearly answerable question	1
2. Tracked down the relevant evidence	1
3. Critically appraised. against set criteria	1
4. Integrated the evidence	1
5. Evaluated the outcomes of your practice	1
6. Shared this information with colleagues	1
Attitude	
7. I resent having my clinical practice questioned	1
8. Evidence-Based Practice is a waste of time	1
9. I stick to tried and trusted methods	1
Retrieving and Reviewing Evidence	
10. Research skills	1
11. Converting your information needs	1
12. Awareness of major information types	1
13. Knowledge of how to retrieve evidence	1
14. Ability to analyze critically	1
15. Ability to determine how valid	0.9
16. Ability to determine how useful	1
Sharing and Applying EBP	
17. Ability to identify gaps	1
18. Ability to apply information	1
19. Sharing of ideas and information with colleagues	0.8
20. Dissemination of new ideas	1
21. Ability to review your own practice	1
“Scale-level Content Validity Index based on the Universal Agreement method: The proportion of items on the scale that achieve a relevance scale of 3 or 4 by all experts. Universal agreement (UA) score is given as 1 when the item achieved 100% experts in agreement, otherwise the UA score is given as 0” (18, p. 52)	S-CVI/UA 0.90
“Scale-level Content Validity Index based on the Average method: The average of the I-CVI scores for all items on the scale” (18, p. 52)	S-CVI/Ave 0.99

Table 3: Experiential panel assessment

Subscale/item	Clear n. (%)	Not clear n. (%)
Frequency of Practice		
1. Formulated a clearly answerable question	56 (86.2)	9 (13.8)
2. Tracked down the relevant evidence	58 (89.2)	7 (10.8)
3. Critically appraised. against set criteria	53 (81.5)	12 (18.5)
4. Integrated the evidence	57 (87.7)	8 (12.3)
5. Evaluated the outcomes of your practice	57 (87.7)	8 (12.3)
6. Shared this information with colleagues	57 (87.7)	8 (12.3)
Attitude		
7. I resent having my clinical practice questioned	56 (86.2)	9 (13.8)
8. Evidence-Based Practice is a waste of time	58 (89.2)	7 (10.8)
9. I stick to tried and trusted methods	56 (86.2)	9 (13.8)
Retrieving and Reviewing Evidence		
10. Research skills	57 (87.7)	8 (12.3)
11. Converting your information needs	53 (81.5)	12 (18.5)
12. Awareness of major information types	56 (86.2)	9 (13.8)
13. Knowledge of how to retrieve evidence	57 (87.7)	8 (12.3)
14. Ability to analyze critically	56 (86.2)	9 (13.8)
15. Ability to determine how valid	59 (90.8)	6 (9.2)
16. Ability to determine how useful	62 (95.4)	3 (4.6)
Sharing and Applying EBP		
17. Ability to identify gaps	59 (90.8)	6 (9.2)
18. Ability to apply information	60 (92.3)	5 (7.7)
19. Sharing of ideas and information with colleagues	62 (95.4)	3 (4.6)
20. Dissemination of new ideas	61 (93.8)	4 (6.2)
21. Ability to review your own practice	64 (98.5)	1 (1.5)

Table 4: Questionnaire scores by time administration

Administration	S-EBPQ				S-EBPQ Total
	subcategories	Attitude	Retrieving/ Reviewing	Sharing/ Applying	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	
Time ₁	5.54 (0.66)	5.82 (0.51)	4.13 (0.35)	5.08 (0.21)	4.89 (0.73)
Time ₂	4.33 (0.47)	5.75 (0.52)	4.26 (0.13)	5.12 (0.21)	4.87 (0.70)
Time ₃	4.86 (0.37)	5.92 (0.43)	4.92 (0.09)	5.29 (0.12)	5.25 (0.49)
Time ₄	5.13 (0.24)	5.88 (0.28)	4.98 (0.12)	5.44 (0.11)	5.46 (0.40)

Note: Time₁ = Baseline S-BPQ administration; Time₂ = End of the theoretical lessons; Time₃ = After the “remote” mode internship; Time₄ = After the “on the field” mode internship

Table 5: Cronbach's Alpha

Subscale	Cronbach's Alpha			
	Time ₁	Time ₂	Time ₃	Time ₄
Frequence of use	0.83	0.83	0.83	0.87
Attitude	0.46	0.61	0.62	0.76
Retrieving/Reviewing	0.87	0.90	0.92	0.92
Sharing/Applying	0.76	0.87	0.83	0.87
Total	0.90	0.91	0.96	0.94

Note: Time₁ = Baseline S-BPQ administration; Time₂ = End of the theoretical lessons; Time₃ = After the “remote” mode internship; Time₄ = After the “on the field” mode internship

Table 6: Pearson's Correlation Coefficient for Age

Subscale	Pearson's Correlation Coefficient (p < 0.05)			
	Time ₁	Time ₂	Time ₃	Time ₄
Frequence of use	- 0.08	- 0.11	- 0.04	- 0.02
Attitude	- 0.06	- 0.16	- 0.03	0.10
Retrieving/Reviewing	- 0.06	- 0.01	0.05	0.16
Sharing/Applying	0.00	0.05	- 0.08	0.10
Total	- 0.06	0.00	- 0.02	0.10

Note: Time₁ = Baseline S-BPQ administration; Time₂ = End of the theoretical lessons; Time₃ = After the “remote” mode internship; Time₄ = After the “on the field” mode internship

Table 7: Pearson's Correlation Coefficient for Gender

Subscale	Pearson's Correlation Coefficient (p < 0.05)			
	Time ₁	Time ₂	Time ₃	Time ₄
Frequence of use	0.08	0.20	- 0.12	0.09
Attitude	- 0.17	- 0.07	0.11	- 0.08
Retrieving/Reviewing	0.02	- 0.23	0.06	0.12
Sharing/Applying	- 0.07	- 0.14	0.06	- 0.04
Total	0.00	0.21	0.01	0.05

Note: Time₁ = Baseline S-BPQ administration; Time₂ = End of the theoretical lessons; Time₃ = After the “remote” mode internship; Time₄ = After the “on the field” mode internship

Table 8: ANOVA Repeated measures

Item	F _(3,354)	P value
1. Formulated a clearly answerable question	4,01	0,008
2. Tracked down the relevant evidence	18,42	< 0,001
3. Critically appraised. against set criteria	26,24	< 0,001
4. Integrated the evidence	17,59	< 0,001
5. Evaluated the outcomes of your practice	9,68	< 0,001
6. Shared this information with colleagues	4,39	0,005
Subscale: Frequency of Practice	21,41	< 0,001
7. I resent having my clinical practice questioned	0,33	0,802
8. Evidence-Based Practice is a waste of time	0,92	0,432
9. I stick to tried and trusted methods	3,55	0,014
Subscale: Attitude	1,42	0,236
10. Research skills	27,72	< 0,001
11. Converting your information needs	13,42	< 0,001
12. Awareness of major information types	25,61	< 0,001
13. Knowledge of how to retrieve evidence	30,71	< 0,001
14. Ability to analyze critically	38,19	< 0,001
15. Ability to determine how valid	26,02	< 0,001
16. Ability to determine how useful	17,57	< 0,001
Subscale: Retrieving and Reviewing Evidence	42,52	< 0,001
17. Ability to identify gaps	4,30	0,005
18. Ability to apply information	6,72	< 0,001
19. Sharing of ideas and information with colleagues	0,26	0,852
20. Dissemination of new ideas	3,59	0,014
21. Ability to review your own practice	3,92	0,009
Subscale: Sharing and Applying EBP	5,02	0,002

from 1 to 7, of 5.84 (SD 0.72); in particular, 4.48 (SD 0.65) in the “*Frequency of practice of EBP*” subscale, 5.76 (SD 0.79) in the “*Aptitude*” subscale, 4.10 (SD 0.36) in the subscale “*Retrieving/Reviewing*” and 5.04 (SD 0.23) in the “*Sharing and Applying*” subscale. The questionnaire reliability was demonstrated by calculating Cronbach’s Alpha, which gave an overall value of 0.92. In the “*Attitude*” subscale, 77.4% of the participants declared that they accepted judgments on their clinical practice; 73% expressed that they consider Evidence-Based Practice as essential to the professional practice;

despite this, only 47.4% of students reported to have changed their procedure following the evidence found. The “*Retrieving/Reviewing*” subscale highlighted the “Transformation of information’s needs into research questions” as the item that got the highest score (average 4.68), while the lowest score (average 3.67) was obtained from the item “Knowledge of how to collect evidence”, for which 16.8% of students reported not being able to collect evidence. For the “*Sharing and Applying*” subscale, 53.3% of participants said they share ideas and information with colleagues, and only

7.3% do not disseminate new ideas about care with colleagues.

At the second administration, carried out in January 2020, after the training period with theoretical lessons, the mean questionnaire score was 4.89 (SD 0.69); in particular, the average score in the subgroup "*Frequency of practice*" was 4.35 (SD 0.44), "*Aptitude*" 5.77 (SD 0.51), "*Retrieving/Reviewing*" 4.32 (SD 0.13), "*Sharing and Applying*" 5.11 (SD 0.20). Cronbach's Alpha was 0.92.

The third administration of the questionnaire was carried out in the first week of October 2020. In this step, students were asked to complete the evaluation of their approach to EBP, in its various aspects, taking into account the internship experience carried out in "remote" mode, introduced due to the COVID-19 pandemic emergency. In this administration, the collected data showed an increase in the mean scores in all subgroups of the questionnaire. The mean scores reported were: mean questionnaire score 5.37 (SD 0.52); subgroup "*Frequency of use of EBP*" 5.12 (SD 0.38), "*Aptitude*" 6.13 (SD 0.43), "*Retrieving and Reviewing*" 4.93 (SD 0.10), "*Sharing and Applying*" 5.31 (SD 0.14). Not statistically significant correlations were found between the questionnaire results and the age and sex of the students (Pearson index $R = -0,02$ and $R = 0,00$, respectively). The overall Cronbach's Alpha obtained from the questionnaire was 0,98.

The fourth administration of the Italian S-EBPQ took place in the last week of October 2020, at the end of the internship carried out "on the field" mode. 119 students (29 male and 90 female) out of 150, took part in the questionnaire, corresponding to 79.3% of the total students involved. The final sample of the study considers only the questionnaires completed by the students in all 4 phases. At this stage, the mean questionnaire score was 5.46 (SD 0.40); in particular, the mean of the score in the subgroup "*Frequency of use of EBP*" was 5.13 (SD 0.24), "*Aptitude*" subgroup mean score was 5.88 (SD 0.28), for "*Retrieving and Reviewing*" 4.98 (SD 0.12) and 5.44 (SD 0.11) in "*Sharing and Applying*" subscale. Compared to the other three administrations of the questionnaire, there was a general increase in the average score. It was registered a slight decline between the first and fourth administration for item 1 (Frequency of use of EBP: Formulated

a clearly answerable question) and item 18 (Sharing and Applying EBP: Ability to apply the information). Not even in this phase did the Pearson Correlation Index show a statistically significant relationship between the questionnaire (respectively $R = 0.10$ and $R = 0, 05$). The overall Cronbach's Alpha of the questionnaire was 0.94, exceeding the value of 0.70 in all subgroups of the instrument.

Discussion

Based on the data collected, the I-CVI was 1, except for item 15 that obtained 0.9, and item 19 that gained 0.8. Overall, the content validity index for the whole questionnaire was 0.9. This data is similar to that reported also by Finotto et al. and Zhang et al. who carried out the validation study respectively of the questionnaire EBP-COQ and S-EBPQ (15,25). The data provided allowed to consider as good validity of the questionnaire, as stated by Polit and colleagues (26), that determine as good validity of the tool when the CVI exceed a value I-CVI of 0.78 and a value S-CVI/Ave of 0.90. As showed in table 3 each item of the Italian version of S-EBPQ was considered *clear* by over 80% of the experiential panel composed of third-year students, highlighting its good face validity; this result is close to that reported in the study by Finotto and colleagues (15).

The study-sample was tested on 119 students of the degree course in Nursing at the University of Perugia. The students attended the second academic year 2019/2020.

Students were asked to express their opinion through a numerical value on a Likert scale from 1 to 7. It was done in four stages over a time-lapse of one year, in order to highlight the occurrence of significant changes following participation in training activities: the questionnaire was administered before the lessons of the "Evidence-Based Nursing" module (to establish a baseline), at the end of these, after the internship period carried out in "remote" mode and following that carried out "on the field". The Pearson's Index, in all four administrations, has shown that the age and the gender of the students are not variables that significantly influence the Evidence-Based Practice ap-

proach. However, it must be considered that most of the students that composed the sample belong to the same age group (21-25 years) and the same gender (females). In each of the four administrations of the S-EBPQ tool, the average score was increasingly growing - demonstrating the positive effects of the training activities on students, as also reported in other similar studies (27-31).

In particular, a noticeable increase was recorded after the "remote" training activity. Issues, such as critical thinking and nursing planning, were expressly and in greater depth addressed through a digital training Advanced Simulation System called "Florence" (developed by I-CEA Zanichelli) dedicated, in specific, to nursing. This Advanced Simulation System has made it possible to implement teaching activities with training interventions aimed to develop skills such as the resolution of clinical cases and the planning of care processes.

The average score of the questionnaire increased in the subgroup "*Frequency of use of EBP*". This increase was recorded between the first and third administration, and between the first and fourth one - that is when the students were able to practice direct nursing care to the patient. On the contrary, a deflection was recorded between the first and second administration (carried out after the students followed the theoretical lessons on EBP): this may indicate how students have a wrong perception about their practice and their ability to use research (this overestimation was also found in the study by Zeleniková et al. (32)) and how they become aware of their gaps with increasing knowledge on Evidence-Based Practice. In all administrations, the participants expressed difficulties in critically evaluating the evidence found; the score related (item 1) has always gradually decreased.

Regarding the "*Aptitudes*" subgroup, the average scores in the different measurements were virtually unchanged, demonstrating that the predisposition to use EBP is an intrinsic aspect of students, but, at the same time, hard to increase through the university teaching program. No statistically significant differences were found even in the study by Rojjanasrirat et al. (29). in which it was used the EBPQ questionnaire. In our study, students expressed in all measurements the acceptance of judgments on their practice; a slightly

lower score was recorded in relation to the change in practice following the new evidence found, thus showing difficulty or resistance to the changing compared to practices carried out "by habit". However, the "*Aptitudes*" subgroup was the one in which the value of Cronbach's Alpha was lower than the other subgroups of the S-EBPQ, as it had already happened during the validation study carried out by the authors of the tool (13). This particular result may be caused by how the questions were displayed. Indeed, they were less intuitive than the other items of the tool.

Besides, the variations in the average scores of the subgroup "*Aptitudes*", are no significant changes in the ANOVA test.

In the "*Retrieval and Review*" aspect of the instrument, scores were gradually significantly increased. Despite this, in all phases of the study, the students expressed difficulties in research skills; this aspect could represent the greatest resistance source for EBP implementation in care practice and constitutes an aspect that requires more time to devote to during university training. In other studies, the students report that they cannot find the necessary information on the internet (33) and they have difficulty to generate a PICO question (34).

The "*Sharing and Application*" subscale reported an improvement in the average score across all administrations, recording statistically significant increases. The most significant changes have occurred with the fourth administration of the S-EBPQ, indicating that the formative training context "on the field" turns out to be a great sharing environment for applying the skills acquired through research. However, the students reported difficulties in using the information in specific cases, indicating the need to increase the ability to adapt the evidence found to patients.

Overall, the questionnaire showed a strong structure; all the analyzes carried out to define the face validity, the content validity, and the internal consistency returned very high values, demonstrating data similar or better to those of other tools present to date (12).

Conclusion

The present study highlighted some limita-

tions. At first, a limitation is the self-report feature of the questionnaire. Furthermore, the request to enter the student's registration number may have led some students to doubt the guarantee of anonymity and decide not to participate in the study (reducing the sample size) or to provide a self-assessment with higher than reality. However, it was impossible to find a different way of tracking the responses between the various steps of the study. Another limit is the lack of a size-study of the sample to generalize the study's results; despite this, considering the high level of response to the questionnaire compared to students involved, it is possible to attribute the sample a good external validity.

Concluding, the tool for this study was researched through a literature review, and chosen based on the indications provided in the Systematic Review - performed by Cardoso and colleagues (35). Furthermore, the S-EBPQ was chosen among the different tools available because it is one of the most used by scholars and researchers (36,37), as evidenced by its cultural adaptation and translation into various languages (25,38). Another aspect - to which reference should be made for future insights - is the low value of Cronbach's Alpha recorded in the Aptitudes subgroup - in the early stages of the study. Carrying out an analysis of the items involved might be useful for improving the S-EBPQ instrument. Finally, future studies may assess any correlations between the questionnaire answers and the results of examinations in the subjects involved by the Evidence-Based Nursing.

References

- 1.FNOPI. Il Codice deontologico delle professioni infermieristiche. Approvato dal Comitato centrale della Federazione e dal Consiglio nazionale degli Ordini delle Professioni infermieristiche riuniti a Roma nella seduta del 12 e 13 aprile 2019. available at: <https://www.fnopi.it/norme-e-codici/deontologia/#1571846131365-8f70c763-6358> (accessed 19 dicembre 2020)
- 2.King R, Taylor B, Talpur A, Jackson C, Manley k, Ashby N, Tod A, et al. Factors that optimise the impact of continuing professional development in nursing: A rapid evidence review. *Nurse Educ Today*. 2020; 104652. doi: 10.1016/j.nedt.2020.104652.
- 3.Emanuel V, Day K, Diegnan L, Pryce-Miller M. Developing evidence-based practice among students. *Nurs Times*. 2011;107(49-50):21-3.
- 4.Robinson KA, Brunnhuber K, Ciliska D, Juhl CB, Christensen R, Lund H. Evidence-Based Research Network. What evidence-based research is and why is it important? *J Clin Epidemiol*. 2020;23:S0895-4356(20)31095-7. doi: 10.1016/j.jclinepi.2020.07.020.
- 5.Ramacciati N. Health Technology Assessment in nursing: a literature review. *Int Nurs Rev*. 2013;60(1):23-30. doi: 10.1111/j.1466-7657.2012.01038.x.
- 6.Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ*. 1996;312:71-72.
- 7.McKinney I, DelloStritto RA, Branham S. Nurses' Use of Evidence-Based Practice at Point of Care: A Literature Review. *Crit Care Nurs Q*. 2019;42(3):256-264. doi: 10.1097/CNQ.0000000000000266.
- 8.Melnyk BM, Fineout-Overholt E, Stillwell SB, Williamson KM. Evidence-based practice: step by step: the seven steps of evidence-based practice. *Am J Nurs*. 2010;110(1):51-3. doi: 10.1097/01.NAJ.0000366056.06605.d2.
- 9.Reale MC, Riche DM, Witt BA, Baker WL, Peeters MJ. Development of critical thinking in health professions education: A meta-analysis of longitudinal studies. *Curr Pharm Teach Learn*. 2018;10(7):826-833. doi: 10.1016/j.cptl.2018.04.019.
- 10.Belowska J, Panczyk M, Zarzeka A, Iwanow L, Cieslak I, Gotlib J. Promoting evidence-based practice - perceived knowledge, behaviours and attitudes of Polish nurses: a cross-sectional validation study. *Int J Occup Saf Ergon*. 2020;26(2):397-405. doi: 10.1080/10803548.2018.1489993.
- 11.Albarqouni L, Hoffmann T, Glasziou P. Evidence-based practice educational intervention studies: a systematic review of what is taught and how it is measured. *BMC Med Educ*. 2018;18(1):177. doi: 10.1186/s12909-018-1284-1
- 12.Longo D, Ramacciati N. Gli strumenti per valutare la pratica basata sulle prove di efficacia tra gli studenti in infermeristica: una revisione narrativa. *Scenario*. 2021;38(1):22-30
- 13.Ruzafa-Martinez M, Lopez-Iborra L, Moreno-Casbas T, Madrigal-Torres M. Development and validation of the competence in evidence based practice questionnaire (EBP-COQ) among nursing students. *BMC Med Educ*. 2013;13:19. doi: 10.1186/1472-6920-13-19.
- 14.Upton P, Scurlock-Evans L, Upton D. Development of the Student Evidence-based Practice Questionnaire (S-EBPQ). *Nurse Educ Today*. 2016;37:38-44. doi: 10.1016/j.nedt.2015.11.010.
- 15.Finotto S, Garofalo E. Validazione per il contesto italiano dell'Evidence Based Practice Evaluation Competence Questionnaire (EBP-COQ) [Italian Validation of Evidence Based Practice Evaluation Competence Questionnaire (EBP-COQ)]. *Prof Inferm*. 2020;73(2):98-105. Italian. doi: 10.7429/pi.2020.732098.
- 16.Upton D, Upton P. Development of an evidence-based practice questionnaire for nurses. *J Adv Nurs*. 2006 Feb;53(4):454-8. doi: 10.1111/j.1365-2648.2006.03739.x.

17. World Health Organization (WHO) (2016) Process of translation and adaptation of instruments. Available at: http://www.who.int/substance_abuse/research_tools/translation/en/ (accessed 30 October 2016).
18. Rutherford-Hemming T. Determining Content Validity and Reporting a Content Validity Index for Simulation Scenarios. *Nursing Education Perspectives*. 2015;36(6):389-393. doi: 10.5480/15-1640.
19. Yusoff MSB. ABC of content validation and content validity index calculation. *Education in Medicine Journal*. 2019;11(2):49-54. doi.org/10.21315/eimj2019.11.2.6
20. Almansreh E, Moles R, Chen TF. Evaluation of methods used for estimating content validity. *Res Social Adm Pharm*. 2019;15(2):214-221. doi: 10.1016/j.sapharm.2018.03.066.
21. Schiling LS., Dixon JK., Knaf KA., Grey M, Ives B, Lynn MR. Determining Content Validity of a Self-Report Instrument for Adolescent Using a Heterogeneous Expert Panel. *Nursing Research*. 2007;56(5):361-366. doi: 10.1097/01.NNR.0000289505.30037.91
22. Park E, Cho M, Ki C-S. Correct Use of Repeated Measures Analysis of Variance. *Korean J Lab Med*. 2009;29:1-9 doi: 10.3343/kjlm.2009.29.1.1
23. Mishra P, Singh U, Pandey CM, Mishra P, Pandey G. Application of Student's t-test, Analysis of Variance, and Covariance. *Annals of Cardiac Anaesthesia*. 2019;22:407-411. doi: 10.4103/aca.ACA_94_19
24. Tavakol M, Dennick R. Making sense of Cronbach's alpha. *International Journal of Medical Education*. 2011;2:53-55. doi:10.5116/ijme.4dfb.8dfd
25. Zhang YP, Liu WH, Yan YT, Zhang Y, Wei HH, Porr C. Developing Student Evidence-Based Practice Questionnaire (S-EBPQ) for undergraduate nursing students: Reliability and validity of a Chinese adaptation. *J Eval Clin Pract*. 2019;25(4):536-542. doi: 10.1111/jep.12897.
26. Polit DF, Beck CT, Owen SV. Is the CVI an Acceptable Indicator of Content Validity? Appraisal and Recommendations. *Research in Nursing & Health*. 2007;30:459-467. doi: 10.1002/nur.20199
27. Leach MJ, Hofmeyer A, Bodridge A. The impact of research education on student nurse attitude, skill and uptake of evidence-based practice: a descriptive longitudinal survey. *Journal of Clinical Nursing*. 2015;25:194-203
28. Ruzafa-Martinez M, Lopez-Iborra L, Barranco DA, Ramos-Morcillo AJ. Effectiveness of an evidence-based practice (EBP) course on the EBP competence of undergraduate nursing students: A quasi-experimental study. *Nurse Education Today*. 2016;38:82-87
29. Rojjanasrirat W, Rice J. Evidence-based practice knowledge, attitudes, and practice of online graduate nursing students. *Nurse Education Today*. 2017;53:48-53
30. Mena-Tudela D, González-Chorda VM, Cervera-Gash A, Marcia-Soler ML, Orts-Cortes MJ. Effectiveness of an Evidence-Based Practice educational intervention with second-year nursing students. *Revista Latino-Americana de Enfermagem*. 2018;26:e3026
31. Cosme S, Milner KA, Wonder A. Benchmarking of Prelicensure Nursing Students' Evidence-Based Practice Knowledge. *Nurse Educator*. 2018;43(1):50-53
32. Zeleniková R, Beach M, Ren D, Wolff E, Sherwood PR. Graduate nursing students' evaluation of EBP courses: A cross-sectional study. *Nurse Education Today*. 2014;35:265-270
33. Brown CE, Wickline MA, Glaser D. Predictors of knowledge, attitude, use and future use of evidence-based practice among baccalaureate nursing students at two universities. *Nurse Education Today*. 2010;30:1-33
34. Zeleniková R, Gurková E, Ziaková K, Tomagová M, Jarosová D, Fineout-Overholt E. Psychometric Properties of the Slovak and Czech Version of the Evidence-Based Practice Belief and Implementation Scales. *Worldviews on Evidence-Based Nursing*. 2016;13(2):139-152
35. Cardoso D, Santos E, Cardoso ML, Oliveira CR, Rodrigues MA, Ap stolo J. Instruments for measuring undergraduate nursing students' knowledge, attitudes and skills in evidence-based practice: a systematic review protocol. *JBI Database System Rev Implement Rep*. 2017;15(8):1979-1986. doi: 10.11124/JBISRIR-2016-003218.
36. Scurlock-Evans L, Upton P, Rouse J, Upton D. To embed or not to embed? A longitudinal study exploring the impact of curriculum design on the evidence-based practice profiles of UK pre-registration nursing students. *Nurse Educ Today*. 2017;58:12-18. doi: 10.1016/j.nedt.2017.07.011.
37. Beccaria L, Beccaria G, McCosker C. A Confirmatory Factor Analysis of the Student Evidence-Based Practice Questionnaire (S-EBPQ) in an Australian sample. *Nurse Educ Today*. 2018;62:69-73. doi: 10.1016/j.nedt.2017.12.010.
38. Park JE, Hwang JI. Psychometric Evaluation of the Korean Version of the Student Evidence-Based Practice Questionnaire (S-EBPQ). *Asian Nurs Res (Korean Soc Nurs Sci)*. 2020, 20:S1976-1317(20)30092-X. doi: 10.1016/j.anr.2020.10.003.

Correspondence:

Received: 30 May 2021

Accepted: 30 November 2021

Donato Longo, RN, BSN

Emergency Department, ICU

Address: Via Don Luigi Sturzo 19, 73010 Surbo (LE), Italy

Phone: +39 327 3093756

E-mail: longo.dona2568@gmail.com