

## Evidence-Based Practice nurses' competency: Spanish National Survey and establishment of a scale of the EBP-COQ-Prof©

### Abstract

**Aims:** To discover the level of Evidence-Based-Practice competency of Spanish nurses, to develop a scale for using the EBP-COQ-Prof© and to analyze the influence of different variables on the level of competency.

**Background:** The Evidence-Based-Practice competency has previously been assessed using a wide variety of instruments, although these have methodological limitations and lack associated scales that allow for the interpretation of the score obtained.

**Method:** Observational, cross-sectional, national study. Using an online questionnaire, data were obtained between January-March 2020 from nurses working in the National Health System. An ANOVA was performed along with multiple regression analyses. The T-score and percentiles were calculated to obtain the EBP-COQ-Prof© use scale.

**Results:** 2942 nurses participated. The score for the Evidence-Based-Practice competency was 130.29 (Standard Deviation 17.55). The multiple regression analysis showed a model comprised of 8 variables that explained 33% of the variance.

**Conclusions:** The Spanish nurses have a moderate level of Evidence-Based-Practice competency. The scale classifies the subjects into 3 levels: low, moderate and high competency.

**Implications for Nursing Management:** The scale proposed for the EBP-COQ-Prof© could be utilized to facilitate the diagnosis of Evidence-Based-Practice competency, to monitor and plan individual and collective strategies to improve this competency.

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3 **Keywords:** Evidence-based practice; competence; nurse; questionnaire, Implementation;  
4 setting norms; scale; survey.  
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## 8 **BACKGROUND**

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10 The use of Evidence-Based Practices (EBP) in clinical practice is fundamental for  
11 improving health outcomes (Coster et al., 2018), the quality of care, and patient safety  
12 (Melnik, Gallagher-Ford, Troseth, et al., 2014). International organizations, such as the  
13 National Academy of Medicine of the United States, and the World Health Organization  
14 (WHO), consider EBP as a core competency for all the health professionals, including  
15 nurses (McClellan et al., 2008; World Health Organization. Regional Office for Europe,  
16 2015).  
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18 In order to rely on professionals who are competent in EBP, health organizations must  
19 understand and apply standards and competency frameworks that include all the EBP  
20 steps (Doležel et al., 2020; Melnik, Gallagher-Ford, Long, et al., 2014), and must also  
21 have available validated and reliable instruments that can be used to measure the level of  
22 EBP competency of the nurses (Saunders & Vehviläinen-Julkunen, 2018). If these  
23 instruments were accompanied by national reference scales of EBP competency of nurses,  
24 this would help the national health services with the interpretation of the results obtained  
25 for their particular sample (Kendall et al., 1999).  
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27 The interest in understanding the level of EBP competency of nurses and their associated  
28 factors has increased in the past few years. An overview of systematic reviews, which  
29 included 59,382 nursing, medicine, physiotherapy, and occupational therapy  
30 professionals from 24 countries, concluded that the attitudes and beliefs of the  
31 professionals towards EBP were positive, and in general, higher than knowledge and  
32 skills, while their use in clinical practices always obtained lower scores (Saunders et al.,  
33 2019). These findings coincided with results from studies conducted with nurses from  
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3 European countries, including Spain (de Pedro-Gómez et al., 2011; Patelarou et al., 2017;  
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5 Pétré et al., 2018; Solís-Muñoz, 2015).

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7 Another systematic review with the participation of 18,355 nurses from 14 countries  
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9 pointed out that nurses did not feel prepared for EBP, independently of their functions,  
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11 clinical contexts or country (Saunders & Vehviläinen-Julkunen, 2016).

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17 The EBP competency of nurses has been associated with aspects related to the nursing  
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19 professionals themselves, with a positive relationship being observed for younger nurses  
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21 with higher levels of education (Belowska et al., 2018; Melnyk et al., 2018) and EBP  
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23 training (Skela-Savič et al., 2016), as well as factors related with their work environments  
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25 such as EBP mentoring and EBP culture (Melnyk et al., 2018).

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28 However, some concerns should be specified. On the one hand, most of the studies were  
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30 conducted at the local level with limited sample sizes, and therefore may only show partial  
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32 results or results that are not representative of health services at the national level. On the  
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34 other hand, the EBP competency has been measured through the use of a wide variety of  
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36 instruments, which limits their comparison. Some questionnaires are general in nature,  
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38 and measure various dimensions of EBP (attitudes, knowledge/skill, utilization), while  
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40 others measure a specific dimension (Saunders et al., 2019). **These instruments** are not  
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42 supported by any current EBP competency framework for the development of its content  
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44 validity (Leung et al., 2014; Ruzafa-Martínez et al., 2020), and show certain  
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46 methodological deficiencies in their validation (Leung et al., 2014). Also, they do not  
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48 have associated scales that allow for the interpretation of the score obtained by each  
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50 subject (or group of subjects) as related to other subjects from the population they belong  
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52 to. In general, the interpretation of the scores obtained after the application of the  
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3 instruments has been based on the minimum and maximum score of the scale, which  
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5 could result in decontextualized interpretations, and is not very operational.  
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8 Recently in Spain, the **Evidence Based Practice Competency Questionnaire, Professional**  
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10 **version** (EBP-COQ-Prof©) was developed, a questionnaire validated in Spanish that  
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12 evaluates the EBP competency starting with the framework of competencies for general  
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14 practice nurses by Melnyk (2014). It was designed to measure the attitude, knowledge,  
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16 skills, and utilization of EBP of nurses, and it had an adequate validity and reliability  
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19 [REDACTED] In order to advance the knowledge obtained until now, in  
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21 the present study, the main objective proposed was to discover the level of EBP  
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23 competency of the nurses who work at the public health centers of the National Health  
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25 System (NHS) of Spain through the EBP-COQ-Prof© questionnaire, and to develop a  
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27 scale to be used in the Spanish context. Likewise, the influence of specific  
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29 sociodemographic and professional variables on the level of EBP competency of the  
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31 Spanish nurses was analyzed.  
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## 34 35 **METHOD**

### 36 37 **Design and setting**

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39 National, observational and cross-sectional study stratified into the 17 Autonomous  
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41 Communities of Spain.  
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### 43 44 **Study subjects and sample selection**

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46 The study population was composed by Spanish nurses who worked in public health  
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48 centers belonging to the Spanish NHS, a total of 174,320 nurses (Ministerio de Sanidad,  
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50 2019). The inclusion criteria were: nurses who were active in public health centers  
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52 affiliated to the NHS, with a minimum experience of 1 year, who worked at a hospital or  
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54 primary care center and with any type of contract.  
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3 To calculate the sample size, a formula was utilized to estimate the mean of the  
4 population, utilizing a stratified design with proportional assignment. For its calculation,  
5 a standard deviation of 0.92 was assumed, as obtained in a previous study [REDACTED]  
6 [REDACTED] with a confidence level of 95% and an error not greater than 0.075,  
7 thereby indicating that 813 subjects should be selected. Having in mind the proportion of  
8 nurses in the 17 Autonomous Communities, the sample was distributed in the following  
9 manner: Catalonia, 133, Andalusia, 122, Madrid, 110, Valencia, 78, Basque Country and  
10 Galicia, 50, Castile and Leon, 47, Castile-La Mancha, 37, Canary Islands, 35, Aragon,  
11 32, and 7 other communities with at least 30 subjects. This implied a sample size of 904  
12 nurses. A stratified convenience sampling method was conducted according to the  
13 Autonomous Communities to obtain the sample size needed.

### 24 **Variables and instruments**

25 An online form was created comprised of two sections:

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27 1) Data on the health professional, which included the following sociodemographic  
28 variables: age, sex; education variables: Degree year, training on EBP, highest level of  
29 nursing education; and professional variables: setting (urban/rural) and context of care  
30 (hospital/primary care), employment status, type of contract, years of professional  
31 experience, nursing student tutoring, number of articles read in the last month, access to  
32 the Internet at work, use of the Internet and other digital tools to access scientific  
33 information, the place where they habitually accessed the Internet to search information  
34 related to their professional practice, and working or not in a Best Practice Spotlight  
35 Organization® (BPSO®) center: health centers that participate in the international  
36 program of the Registered Nurses Association of Ontario (RNAO), for the  
37 implementation of Clinical Practice Guidelines.

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3 2) Competency questionnaire on Evidence-Based Practices, Professional version “EBP-  
4 COQ-Prof©” [REDACTED] This instrument has an adequate validity  
5 and reliability, with a final model of 4 factors with 35 items, a Confirmatory Factor  
6 Analysis (CFA) fit index values of  $\chi^2 = 1935.92$  (df = 554;  $p < 0.001$ ),  $\chi^2/df=3.49$ , CFI =  
7 0.932, TLI = 0.927, and RMSEA = 0.093(90% CI= 0.097–0.108). Cronbach’s  $\alpha$  for each  
8 factor ranged from 0.817 (factor III) to 0.948 (factor II). The 35 items were organized  
9 into 4 factors: factor I: Attitude (8 items, with a range of scores from 8-40), Factor II:  
10 Knowledge (11 items, range 11-55), factor III: Skills (6 items, range 6-30), and factor IV:  
11 Utilization (10 items, range 10-50). The items were answered using a Likert scale ranging  
12 from 1 to 5 (a greater score indicates a greater competency). The overall score of the level  
13 of EBP competency had a range between 35 and 175 points.

#### 24 **Data collection procedure**

25 The data collection was performed online from January to March, 2020, utilizing a  
26 national collaborative campaign named #Evidencer. The campaign asked for the  
27 participation of the nurses from the entire country through the social networks and  
28 professional schools, trade unions and scientific associations.

#### 29 **Data analysis**

30 The data were analyzed having in mind the dimensions of the EBP-COQ-Prof©  
31 instrument. A univariate and descriptive analysis was performed, with central tendency  
32 measurements (mean and standard deviation). To create the EBP-COQ-Prof© scale, the  
33 mean scores of the dimensions and the total scores were calculated and transformed to a  
34 T-scale with a mean of 50 and standard deviation of 10, following a normal distribution,  
35 as well as its corresponding scale in percentiles, both of which are widely used in Health  
36 Sciences (Kendall et al., 1999).

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3 Afterwards, a bivariate analysis was conducted through a one-way ANOVA to discover  
4 the relationship between the EBP competency and the nursing professional variables.  
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6 Those that were significant were included in multivariate models (multiple linear  
7 regression) to determine the influence of the variables analyzed on the EBP competency.  
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9 Also, a graphical analysis of the mean scores obtained according to the EBP-COQ-Prof©  
10 items, calculated using a range between 1 and 5 and desegregated according to  
11 educational level of the nurses (Bachelor, Master, Clinical Nurse Specialist and PhD). In  
12 the statistical analysis, a level of significance of 5% ( $p \leq 0.05$ ) was considered. The  
13 analysis was conducted with the SPSS program v. 26.0.

### 24 **Ethical Considerations**

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26 The study was approved by the Ethics Committee of the University of [REDACTED] (ID:  
27 2540/2019). The professionals were invited to participate voluntarily through the online  
28 questionnaire. They were informed about the objectives of the study, clarifying that their  
29 participation was completely anonymous and that submitting the questionnaire granted  
30 their consent for participating in the study.

## 37 **RESULTS**

### 40 **Sample description**

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42 The final sample was composed of 2,942 nurses from all 17 Autonomous Communities  
43 of Spain, well above the optimum sample size calculated. Table 1 shows the main  
44 characteristics of the participants, who had an average age of 41.8 (SD=9.8); 79.3%  
45 (n=2333) were women, with an average work experience of 17.9 years (SD=10.0).

### 51 **EBP competency of the nurses in Spain and the EBP-COQ-Prof © scale**

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53 The mean score of the level of EBP competency of the Spanish nurses was 130.28  
54 (SD=17.55). The results according to the dimensions revealed, for the dimension attitude,  
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3 a mean score of 36.89 (SD 3.43); for knowledge, 37.54 (SD 9.27); for skills, 22.94 (SD  
4 3.61), and for the dimension utilization, a mean score of 32.90 (SD 6.31) (Table 2).

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7 The scaling of each of the dimensions and the EBP-COQ-Prof© total was defined by T-  
8 scores and percentiles (Table 2). This scale allows the direct scores obtained to be  
9 assigned to their corresponding percentile and T-scores, facilitating their interpretation  
10 and comparison between dimensions even when the dimensions have different score  
11 ranges. For their use, once the direct EBP-COQ Prof© scores were obtained from the  
12 sample studied, these were placed in the score range of the scale, after which the  
13 percentile or T-score that corresponded to it could be found, as shown in Table 2. When  
14 the direct scores had decimals, the  $\leq 0.5$  values were assigned to the lower percentile or  
15 T-score, and the values  $> 0.5$  were assigned to the greater percentile or T-score. The scale  
16 also classified the subjects into 3 levels of competency: low, if they were found between  
17 percentiles 1-25; moderate, between percentiles 26 and 75; and high if between  
18 percentiles 76 and 100.

### 35 **Explanatory model of the Evidence-Based Practice competency**

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37 Table 3 shows the models obtained after the multiple regression, for the total EBP-COQ-  
38 Prof© score. Model 8 explained 33% ( $R^2 = 0.33$ ) of the variance. In this case, the Durbin-  
39 Watson D confirmed the validity of the model ( $D = 1.89$ ). The t test detected an association  
40 between all the variables included in the model, with a probability of error below 0.05.  
41 These were: number of articles read in the past month, training in EBP, having a Master's  
42 degree, having a PhD degree, years after the end of the Bachelor's in Nursing Degree, a  
43 BPSO® center, tutoring of undergraduate nursing students, and having a Specialized  
44 Nursing degree. The indicators of tolerance and the variance inflation factor (VIF)  
45 indicated the absence of co-linearity between the variables.

### 58 **EBP competency and level of education**



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3 The results of the comparison between the mean scores obtained for the dimensions and  
4 the total score obtained in the EBP-COQ-Prof©, according to the level of education of  
5 the nurses, allow us to explain the overall results and demonstrates the usefulness of the  
6 scale (Table 4). In a general manner for all the dimensions and the overall EBP  
7 competency, lower mean scores were observed for nurses with a Bachelor's degree as  
8 compared to nurses with higher levels of post-graduate education (Masters, Clinical  
9 Nurse Specialist and PhD), especially in the dimensions of knowledge and skills. More  
10 specifically in the level of EBP competency, the Bachelor's degree nurses were found in  
11 the 25<sup>th</sup> percentiles, indicating that they had a low level of competency, as 75% of the  
12 nurses obtained higher scores. As the level of education increases, so does the level of  
13 EBP competency, until reaching the 80<sup>th</sup> percentile for nurses with a PhD, who have a  
14 high level of competency, as only 20% of the nurses obtained higher scores. Lastly, figure  
15 1 shows the mean scores of the EBP-COQ Prof© items with scores ranging from 1 to 5,  
16 from lower to higher, and desegregated according to the level of education of the nurses.  
17 These findings show a generalized pattern, where in most of the items, the responses of  
18 the nurses with a PhD degree always obtained a higher score (more competent), followed  
19 by the ones from clinical nurse specialist, Masters, and lastly Bachelors. However, this  
20 trend disappears and it is even inverted in some of the items related with the use of the  
21 EBP in work environments.

## 22 **DISCUSSION**

23 Our study relied on the high participation of nurses from the Spanish NHS, overcoming  
24 the sample size needed, globally and according to Autonomous Community. This is a  
25 national study for measuring EBP competency, with the largest sample of nurses until the  
26 present (Saunders & Vehviläinen-Julkunen, 2016; Ubbink et al., 2013). The  
27 sociodemographic and professional profile of the participants coincided with the Spanish  
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nurses who work in public health centers (Ministerio de Sanidad, 2019), and was similar to other countries (Belowska et al., 2018; Melnyk et al., 2018). It should be highlighted that the sample had a high proportion of nurses with postgraduate degrees (Masters and PhD), higher than previous studies conducted in Spain and in other countries (de Pedro-Gómez et al., 2011; Melnyk et al., 2018; Patelarou et al., 2017; Solís-Muñoz, 2015). This increasing trend has been observed in the past few years in Spain (Esteban-Sepúlveda et al., 2019).

### **EBP competency of Spanish nurses and associated factors**

Our results, interpreted in the most common manner, according to the minimum and maximum scores, showed higher mean scores for attitude (36.89 in a 8-40 range), followed by the dimension skills (22.94 in a 6-30 range), and lower scores for knowledge (37.54 in an 11-55 range), and utilization (32.90 in a 10-50 range), which implies a global competency score of 130.28 (range between 35-175), with these results in agreement with other studies (Saunders et al., 2019; Solís-Muñoz, 2015). The behavior of the dimension attitude was striking, as the results were grouped around the highest scores. This behavior was also observed in previous studies that utilized the instruments that assess the attitude towards EBP (Upton et al., 2014). Studies about organizations have linked social desirability, defined as the tendency to provide an answer to the items just as one would answer to social pressures or norms, to a high score in the attitude dimension (Salgado, 2005). The main effect of social desirability is that one tends to exaggerate the scores, and one of the strategies utilized to reduce its effects is the use of specific scales (Salgado, 2005). In this way, despite the direct scores being higher, as found for attitude, the relative position offered by the scale contextualized it with its reference group.

The educational level of the nurses was one of variables associated with EBP competency, and the analysis according to dimensions and items of the EBP-COQ-Prof© allowed us

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3 to obtain interesting findings. In first place, as already pointed out in previous studies, the  
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5 higher the postgraduate training, the greater the level of knowledge, skills and EBP  
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7 utilization (Belowska et al., 2018; Melnyk et al., 2018). Our findings also allowed us to  
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9 assess the behavior at the global level, as well as according to dimensions of EBP  
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11 competency, placing the Bachelor's degree nurses in lower percentiles and T-scores,  
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13 which gradually increased following a Master's, Clinical Nurse Specialist, and PhD path.  
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15 The differences according to education level were more important in the knowledge and  
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17 skills dimensions, where the nurses with a PhD were placed in the 90<sup>th</sup> and 80<sup>th</sup>  
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19 percentiles, respectively, decreasing in the dimension utilization to the 60<sup>th</sup> percentile.  
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24 The analysis of the items provides an answer for this discrepancy. Independently of the  
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26 level of education of the nurses, differences in the mean score of some items related with  
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28 the dimension utilization, were not found. These items were related with the use of EBP  
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30 at work, meaning, in the context where the care was provided. The context is a  
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32 determining factor in the different models found for the implementation of knowledge  
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34 (Clavijo-Chamorro et al., 2020; Nilsen, 2015). And it has already been documented that  
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36 a conducive environment for EBP favors its application by health professionals (Melnyk,  
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38 2014; Skela-Savič et al., 2016). It should be asked, then, if having nurses who are highly  
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40 prepared for EBP in environments that are not conducive to its application, blocks their  
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42 capacity and competency, with the result that the excellence in care provided is not  
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44 reached. It is necessary to generate debate and to place the focus of attention on the  
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46 improvement of work environments for the implementation of EBP, and on the  
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48 development of policies that favor the success of the EBP implementation programs.  
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53 This idea is supported by another novel finding from our study, namely, the positive  
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55 influence on the EBP competency of the nurses working in centers that participate in the  
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57 BPSO® program. These centers work on the implementation of Clinical Practice  
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3 Guidelines through a systematic method, where barriers and facilitators are analyzed, and  
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5 where implementation strategies adapted to the context are provided (Ortuño-Soriano et  
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7 al., 2020).

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10 Our findings showed other factors that have an influence on the EBP competency of  
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12 nurses. It was observed that there was a positive relationship with the frequency of reading  
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14 of scientific articles, with this relationship being negative with the number of years after  
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16 the completion of the Bachelor's Nursing degree, coinciding with previous research  
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18 studies (Pérez-Campos et al., 2014; Pericas-Beltran et al., 2014). Also, as previous studies  
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20 have shown (Upton et al., 2014) EBP training was revealed to be a positive factor,  
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22 although the influence of EBP training programs on the improvement of the levels of the  
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24 real application of EBP in clinical practice is not entirely clear (Ramos-Morcillo et al.,  
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26 2015). Another novel finding was the relationship of being a tutor in the practical training  
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28 of undergraduate nursing students with the level of EBP competency, perhaps because  
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30 we are dealing with health professionals who are affiliated to university health centers  
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32 and who are involved in the academic and research training of health professionals. Also,  
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34 the nursing students could be a source of pressure for the tutor, as they could be helping  
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36 their tutors to question specific practices and to find and analyze research results, as  
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38 shown in other studies (Stone & Rowles, 2007).

#### 44 45 **Standardization of the EBP-COQ-Prof© scale**

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47 The EBP-COQ-Prof© is a robust instrument, based on theoretical assumptions, with good  
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49 psychometric properties and validated in a Spanish healthcare environment [REDACTED]  
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51 [REDACTED] Its application to an important, homogeneous and representative  
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53 sample of Spanish nurses has allowed us to propose a scaling system for each of the  
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55 dimensions, and the questionnaire as a whole. This scaling, conducted for the first time  
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57 in an instrument that assesses the EBP of nurses (Leung et al., 2018; Saunders &  
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3 Vehviläinen-Julkunen, 2018), allows us, through the use of the EBP-COQ-Prof©, to  
4 make inferences with respect to the scores found, and facilitates the interpretation of the  
5 questionnaire results through the use of percentiles and T-scores. Therefore, it helps with  
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10 objectivizing the level of EBP competency of an individual or the group of nurses who  
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12 were studied with respect to the competency of Spanish nurses as a whole, and not only  
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14 through the use of the mean score. Thus, this instrument can be utilized for the evaluation  
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16 of professional competencies of the nurses, a fundamental component of the processes of  
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18 quality improvement in a given health organization (Numminen et al., 2013).

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21 In future research studies, the EBP-COQ Prof© and its scale could be used for diagnosing  
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23 the EBP competency at the individual and group levels, the development of interventions  
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25 according to areas of improvement identified in the diagnostic phase, the comparison of  
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27 competency according to the level of postgraduate training, or for monitoring the changes  
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29 in competency after training interventions.  
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### 32 33 ***Limitations***

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35 The main limitation of the study is the manner in which the participants were selected, as  
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37 a randomized sampling method could not be utilized, and the administration of the  
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39 questionnaire was performed online. This could condition the profiles of the health  
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41 professionals who participated. However, these aspects were tried to be minimized  
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43 through the stratification according to Autonomous Communities and the use of multiple  
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45 strategies for the selection of the participants, by inviting them to participate through  
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47 different electronic means to reach the maximum number of nurses possible.  
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### 50 51 ***Conclusions***

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53 The Spanish nurses have a level of EBP competency with high scores on attitude,  
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55 moderate ones in skills and lower ones in knowledge and utilization of the EBP. The  
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57 factors that influenced EBP competency were linked to the individual: frequency of  
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3 reading of scientific articles, training in EBP, level of education and number of years after  
4 the end of the Nursing Degree, and the context: tutoring of undergraduate students and  
5 working in a BPSO® center. The nurses with higher levels of education showed high  
6 levels of competency in knowledge and skills, and lower levels in the utilization of EBP.  
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8 The scale proposed for the EBP-COQ-Prof© could be used to facilitate the diagnosis of  
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10 EBP competency in specific collectives of Spanish nurses, as well as to monitor and plan  
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12 individual and collective strategies to improve this competency.  
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### 19 **Implications for Nursing Management**

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21 The evaluation of the EBP competency of frontline nurses is a fundamental element for  
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23 improving clinical practice. The use of tools that measure the level of EBP competency  
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25 along with national scales will facilitate the nurse managers and human resources  
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27 departments in the health services' ability to diagnose and monitor this competency in a  
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29 robust, simple and contextualized manner. Thus, this will allow nursing management to  
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31 better direct the focus of the interventions for improving the competency of nurses, as  
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33 they will understand in which EBP dimension we find a greater number of deficiencies.  
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39 Furthermore, the health services that aspire to increase the EBP competency of the  
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41 nurses can rely on strategic elements such as the hiring of nurses with high levels of  
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43 academic training, the implementation of continuous training programs that are specific  
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45 to EBP and, the development of strategies to increase the frequency of reading scientific  
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47 articles. Besides, the nurses who have a PhD had the greatest EBP competencies, and  
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49 therefore they are the ideal health professionals for dealing with aspects related with the  
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51 management and implementation of the EBP. Also important are measures that favor  
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53 changes in the work environment as well as the participation in systematic  
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55 implementation programs of evidence, and the collaboration with universities through  
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57 the tutoring of nursing students.  
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# Figure 1. EBP-COQ Prof© items scores by educational level

● Bachelor 
 ● Master 
 ● Clinical Nurse Specialist 
 ● Doctoral 
 ● All



**Table 1. Sociodemographic and professional variables of the sample (N=2942)**

	<b>M</b>	<b>SD</b>
Age (years)	41,8	9,8
Years since completing the Nursing degree (years)	20,1	10,0
Professional experience (years)	17,9	10,0
	<b>n</b>	<b>%</b>
Sex		
Male	609	20,7
Female	2333	79,3
Educational Level		
Bachelor	1374	46,70
Master	1119	38,03
Clinical Nurse Specialist	261	8,87
Doctoral	188	6,40
Employment status		
Eventual	654	22,3
Interim	701	23,8
Permanent	1587	53,9
Type of contract		
Full time	2663	90,5
Part time	279	9,5
Setting		
Urban (> 50,000 inhabitants)	2022	68,7
Suburban (between 10,000 and 50,000 habitants)	651	22,1
Rural (<10,000 habitants)	269	9,1
Context of care		
Hospital	2062	70,1
Primary care	880	29,9
Training on EBP n (%)		
None	464	15,8
< 40 hours	761	25,9
40 - 150 hours	860	29,2
> 150 hours	857	29,1
Number of articles read in the last month		
0	588	20,0
1 and 3	1241	42,2
> 3	1113	37,8
Working at a BPSO® center		
Yes	635	21,6
No	2307	78,4
Undergraduate nursing students tutor		
Yes	1451	49,3
No	1491	50,7
Use of the Internet and other digital tools to access scientific information		
Yes	2423	82,4
No	519	17,6
Access to the Internet at work		
Yes	2667	90,7
No	275	9,3
Place where access the Internet most frequently to consult information		
Home	2284	77,6
Work	658	22,4

M: Mean; SD: Standard Deviation;

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Table 2. Mean scores of the EBP dimensions and total competency and the EBP-COQ Prof© scale on percentiles and T-scores among Spanish Nurses

	Attitude			Knowledge			Skills			Utilization			Total		
<b>Mean</b>	36.89			37.54			22.94			32.90			130.28		
<b>SD</b>	3.43			9.27			3.61			6.31			17.55		
<b>min-max scores</b>	8-40			11-55			6-30			10-50			35-175		
<b>Competency Level</b>	<b>PC</b>	<b>DS</b>	<b>T</b>	<b>PC</b>	<b>DS</b>	<b>T</b>	<b>PC</b>	<b>DS</b>	<b>T</b>	<b>PC</b>	<b>DS</b>	<b>T</b>	<b>PC</b>	<b>DS</b>	<b>T</b>
Low	1	8-26	18	1	11-14	25	1	6-13	23	1	17-21	25	1	35-85	24
	5	27-31	33	5	15-22	33	5	14-16	31	5	22-24	33	5	100-106	33
	10	32	36	10	23-24	35	10	17-18	36	10	25-28	38	10	107-118	37
	25	33-35	45	25	25-32	44	25	19-21	45	25	29-31	44	25	119-126	43
Moderate	40	36-37	50	40	33-36	48	40	20-22	47	40	32	49	40	127-131	48
	50	38	53	50	37-38	50	50	23	50	50	33	50	50	132-135	51
	-	-	-	60	39-41	54	60	24	53	60	34-35	53	60	136-139	53
	-	-	-	70	42-43	56	-	-	-	70	36	55	70	140-141	55
High	75	39	56	75	44	57	75	25	56	75	37	56	75	142-144	57
	-	-	-	80	45	58	80	26	58	80	38-40	58	80	145-151	58
	-	-	-	90	46-49	62	90	27-28	61	90	41-42	63	90	152-157	62
	-	-	-	95	50-52	66	95	29	67	95	43-49	66	95	158-174	66
	100	40	59	100	53-55	69	100	30	70	100	50	77	100	175	75

SD: Standard Deviation; DS: Direct Scores; PC: Percentile; T: T-scores

Table 3. Stepwise multiple linear regression model in Evidence-Based Practice (n=2943).

Model	R	R <sup>2</sup>	corrected R <sup>2</sup>	Std. Error of Estimations	Change Statistics			Durbin-Watson
					Change in R <sup>2</sup>	Change in F	Sig. of change in F	
1	0.46	0.21	0.21	14.99	0.212	638.24	0.000	
2	0.54	0.29	0.29	14.21	0.080	266.78	0.000	
3	0.55	0.30	0.30	14.09	0.013	43.04	0.000	
4	0.56	0.31	0.31	14.03	0.006	19.72	0.000	
5	0.56	0.32	0.31	13.98	0.006	20.01	0.000	1.89
6	0.57	0.32	0.32	13.91	0.004	23.75	0.000	
7	0.57	0.33	0.32	13.87	0.004	13.65	0.000	
8	0.57	0.33	0.33	13.85	0.003	10.34	0.001	

  

Model 8	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity	
	B	Std. Error	Beta			Tol	VIF
(Constant)	113.75	0.89		128.21	0.000		
Number of articles read	7.45	0.43	0.32	17.13	0.000	0.84	1.19
Training in EBP	4.30	0.30	0.27	14.28	0.000	0.81	1.23
Master degree	3.30	0.61	0.10	5.42	0.000	0.89	1.13
PhD degree	5.03	1.14	0.08	4.41	0.000	0.91	1.10
Years after Nursing degree	-0.15	0.03	-0.09	-5.18	0.000	0.90	1.12
BPSO® center	3.16	0.65	0.08	4.88	0.000	0.99	1.02
Nursing students tutor	2.29	0.60	0.07	3.83	0.000	0.91	1.10
Clinical Nurse Specialist degree	2.92	0.91	0.06	3.21	0.001	0.96	1.04

Tol: tolerance. VIF: variance inflation factor. BPSO: Best Practice Spotlight Organization.



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Table 4. Comparison of the dimensions and total EBP-COQ-Prof © according nurses' educational level

	n	%	Attitude				Knowledge				Skills				Utilization				Total			
			M	SD	PC	T	M	SD	PC	T	M	SD	PC	T	M	SD	PC	T	M	SD	PC	T
1 Bachelor	1374	46,70	36,31 <sup>2-3-4</sup>	3,68	40	50	33,86 <sup>2-3-4</sup>	8,77	40	48	22,00 <sup>2-3-4</sup>	3,61	40	47	32,40 <sup>2-4</sup>	6,02	40	49	124,58 <sup>2-3-4</sup>	16,98	25	43
2 Master	1119	38.03	37,30 <sup>1</sup>	3,10	40	50	39,60 <sup>1-3-4</sup>	8,53	60	54	23,47 <sup>1-4</sup>	3,45	50	50	33,11 <sup>1-4</sup>	6,57	50	50	133,50 <sup>1-4</sup>	16,53	50	51
3 CNS	261	8,87	37,45 <sup>1</sup>	3,18	40	50	41,08 <sup>1-2-4</sup>	7,48	60	54	23,67 <sup>1-4</sup>	3,09	60	50	33,39	6,19	50	50	135,60 <sup>1-4</sup>	15,10	60	53
4 PhD	188	6,40	37,91 <sup>1</sup>	2,99	50	53	47,30 <sup>1-2-3</sup>	6,10	90	62	25,54 <sup>1-2-3</sup>	2,94	80	58	34,57 <sup>1-2</sup>	6,54	60	53	145,34	14,35	80	58
Total	2942	100,0	36,89	3,43	40	50	37,54	9,27	50	50	22,94	3,61	50	50	32,90	6,31	50	50	130,28	17,55	40	48

CNS= Clinical Nurse Specialist; M= Mean; SD= Standard Deviation; PC= Percentile; T= T-scores. <sup>1,2,3,4 y 5</sup> indicates the category of nurses' educational level with which it has statistically significant differences (p<0,000) in the pairwise analysis of the Games-Howell post-hoc comparison test.