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Article

Evidence-Based Practice Competency of Registered Nurses in the Greek National Health Service

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Abstract: Nurses' competency towards Evidence-based Practice (EBP) has been extensively investigated by several studies worldwide. However, factors affecting the competence of Greek nurses working in the NHS have not been fully investigated in terms of EBP. Thus, this study aimed to explore the impact of individual qualifications of nurses on their competence towards EBP. Data from 473 registered nurses working in 10 hospitals of in the Greek National Health Service (NHS) were collected between October and December 2022 using a convenience-sampling method in a cross-section design. The Greek version of the 35-item (5-point Likert scale) Evidence-Based Practice Competency Questionnaire for Professional Registered Nurses (EBP-COQ Prof) was used to assess the competence level of nurses focusing on the attitudes, skills, and knowledge as well as the utilization of EBP in clinical practice. One-way ANOVA and Pearson coefficient tests were applied to compare possible differences among variables (two or more groups) as appropriate. A multi-factorial regression model was applied to explore participants' qualifications, including demographics (MSc degree, gender, English language knowledge, etc.) as independent variables, and to control for potential confounding effects toward EBP competency. P-values <0.05 were considered statistically significant. The mean age of 473 participants (402 women and 71 men) was 44.7 ± 9.2 years old. The mean value of competence subscales was found as follows: attitudes 3.9 ± 0.6 , knowledge 3.7 ± 0.6 , skills 3.1 ± 0.8 , and utilization 3.4 ± 0.7 . A multivariate regression analysis revealed that associates of "Master's degree" ($t=3.039$, $p=0.003$), "Writing an academic article" (3.409 , $p=0.001$), "Working in a University clinic" (2.203 , $p=0.028$) and, "Computer Skills" (2.404 , $p=0.017$) are positively affecting 'Attitudes', 'Knowledge', 'Skills' and 'Utilization'. Respectively. The research data suggest that nurses working in Greek NHS are limited in competence towards EBP in comparison to other European countries. Therefore, Vocational, Educational and Training programs tailored to EBP enhancement are crucially important.

Keywords: Evidence-based practice; nurses; competency; attitude; knowledge; skills; utilization

1. Introduction

Evidence-based practice (EBP) results in improved healthcare quality and health outcomes, enhances the reliability of healthcare and reduces variations in care and costs [1-4]. Nurses' competency is defined as "an expected and measurable level of nursing performance that integrates knowledge, skills, abilities, and judgment, based on established scientific knowledge and expectations in nursing practice" [1,5]. For this reason, researchers stress the need for cultivating nurses' EBP competencies even from the undergraduate level and focus on designing educational programs and digital tools for undergraduate and postgraduate students and professional nurses as well [6-13]. In this direction, health organizations aim to reach a high level of practice and the best quality patient outcomes while they highlight the necessity to evaluate nurses' EBP in order to provide evidence-based, high-quality, and cost-effective care [1]. Healthcare systems and hospitals should provide the proper equipment and educational support in order to develop EBP competencies in their clinicians and nurses [14].

An increasing number of different scales have been used to evaluate nurses' EBP across Europe. One of those, the EBP-COQ Prof by the Spanish National Survey [15], showed that it could be a beneficial tool when evaluating factors such as levels of education and years of training post-degree, along with active scientific interest such as reading articles and attending seminars. These factors were considered to enhance and develop EBP competency [16]. However, a systematic review by Saunders et al. (2019) has stated that EBP competencies alone are not sufficient and cannot be used exclusively in order to reach a high level of EBP in healthcare practice [17]. The same review concludes that competency assessment should be used as an aspect of the development and evaluation of clinical practice as well as that there is a need for validated tools in order to measure EBP competency that can be more accurate than mere self-assessments [17].

Based on an updated literature review, in a European context, a consensus of experts from the Czech Republic, Greece, Italy, Poland, Slovenia, and Spain, 24 EBP competencies and 120 learning outcomes for general nurses and advanced practice nurses were identified in order to conclude a common tool that can be used in order to assess nursing competency, which it will be used for educational intervention and the integration of EBP into daily clinical practice [10].

According to the literature, there seems to be a lack of validated questionnaires in Greek health systems. Major strategies to evaluate nurses' competency are required so as to focus on training programs and practices in order to improve everyday health practice. There has been an attempt by Patelarou et al. (2021) to translate and validate the EBP-COQ questionnaire to evaluate EBP competency in nursing students [18].

In a recent study conducted by Schetaki et al. (2022) in Greece [19], as precisely defined by Melnyk [2], it was shown that the EBP-COQ Prof questionnaire, translated and validated in Greek, is able to measure and evaluate the competency of nurses in the National Health System (NHS) in Greece. This was confirmed in terms of knowledge, skills, and attitude but also in the utilization of EBP in their daily clinical settings.

The purpose of this study is to measure and evaluate the competence of NHS nurses in Greece using the valid questionnaire EBP-COQ Prof [19] as well as assessing the variables that can influence that competence in terms of EBP.

2. Materials and Methods

2.1. Aim

The aims of this study were: a) to investigate the practice, attitude, knowledge, and skills of Greek nurses towards EBP, and b) to determine relationships between the EBP competency and nurses' demographic characteristics (personal and professional factors).

2.1.2. Study Design and Sample

The study was a cross-sectional survey and utilized a descriptive study design to investigate Greek nurses' practice, attitude, knowledge, and skills towards EBP and the demographic factors associated with them. A convenience sample was recruited from nurses employed by ten hospitals in Greece (4 from Athens and 6 from the island of Crete). The sample was recruited from different types of nursing units with the following inclusion criteria: 1) registered nurse as professional role, 2) age > 18 years, and 3) ability to read in Greek.

2.1.3. Data Collection Tools

The study used two tools to collect data – the Evidence-Based Practice Competency Questionnaire for Professional Registered Nurses (EBP-COQ Prof) and a demographic survey which was developed specifically for the purposes of the present study.

The EBP-COQ Prof was developed and psychometrically-tested to measure Spanish-speaking nurses' attitudes towards evidence-based practice [20]. Schetaki et al. (2022) translated the EBP-COQ Prof into Greek, establishing the scale's validity and reliability for Greek nurses (Cronbach- α : Attitudes (8 items; $\alpha = 0.89$), Knowledge (11 items; $\alpha = 0.94$), Skills (6 items; $\alpha = 0.82$), and Utilization

(10 items; $\alpha = 0.87$) [19]. The EBP-COQ Prof scale consists of 35 items that attempt to assess the competence of nursing staff by focusing on the attitudes, skills, and knowledge around EBP, as well as the utilization of EBP in clinical practice. These 35 items are in the form of a 5-point Likert scale (1 corresponding to totally disagree, 2 to disagree, 3 to neither agree nor disagree, 4 to agree, and 5 to agree completely), with higher scores indicating a higher positive attitude towards EBP.

In order to determine factors that are associated with different attitudes about EBP, we developed a form to gather personal and professional information from each of the subjects (age, biological sex, possession of a master’s degree, years of nursing experience, writing academic/professional nursing articles in the last 5 years, level of English language knowledge, level of computer knowledge).

2.1.4. Ethical Consideration

This research was reviewed and approved by the Hellenic Mediterranean University Ethics Committee (No 28/18.01.21). This survey was carried out in full compliance with the new General Data Protection Regulation (GDPR) [EU 2016/679] 25.5.2018 on sensitive personal data. Prior to its implementation, the relevant licenses were secured by the respective services. The data collected were anonymous; their use was made solely for the purposes of the survey and for access to them by the lead researcher. The participants consented in writing, having been fully informed that the procedure was anonymous, that their personal data and answers would be used exclusively for research purposes, and that at any time, they would be able to leave.

2.1.5. Data Analysis

We performed the statistical analysis using SPSS version 25.0 (SPSS Inc., Chicago, IL, USA) [21]. Continuous variables were expressed as mean \pm standard deviation (sd) and categorical variables were expressed as absolute numbers (n) and percentages (n%). Normality of the variables was tested by the Shapiro-Wilks test, and through the study “Normal Q-Q plot”, “Detrended Normal Q-Q plot”, and “Box Plot”. For all tests, statistical differences were determined to be significant at $p < 0.05$. We used the independent t-test when are interested to compare two group means, and One-way ANOVA to compare of more than two group means. To correlate two continuous variables, we used the Pearson coefficient. To correlate a continuous variable with an ordinal variable, we used the Point Biserial coefficient. For the purposes of the analysis of confounding factors associated with EBP-COQ Prof subscales, we used a multiple linear regression model. In the univariate analysis, the criterion for the initial entry of variables into multiple regression models was $p < 0.25$.

3. Results

3.1. Descriptive analysis

The study sample consists of 473 participants (402 women and 71 men), average age 44.7 years (SD = 9.2). The average time of nursing experience is 17.3 years (SD = 10.1), and one hundred seventy-one (36.5%) were working in a university clinic.

One hundred eighteen nurses (25.0%) held a Master’s degree, and fifty-three (11.2%) they had written at least one academic or professional nursing article in the last 5 years. Twenty nurses (4.3%) had no knowledge of English at all and eighty-six (18.3%) had excellent knowledge. Three nurses (0.6%) had no knowledge of computer at all and one hundred nineteen (25.4%) had excellent knowledge [Table 1].

Table 1. Characteristics of sample.

	N	N %
Biological sex		
Male	71	15.0%
Female	402	85.0%

Age (mean ± sd)	44.7 ± 9.2	
Master's degree		
No	354	75.0%
Yes	118	25.0%
Writing academic/professional nursing articles in the last 5 years		
No	420	88.8%
Yes	53	11.2%
English language knowledge		
Not at all	20	4.3%
Moderate	108	23.0%
Good	255	54.4%
Excellent	86	18.3%
Computer knowledge		
Not at all	3	0.6%
Moderate	83	17.7%
Good	264	56.3%
Excellent	119	25.4%
Work in a university clinic		
No	297	63.5%
Yes	171	36.5%
Years of nursing experience (mean ± sd)	17.3 ± 10.1	

As for the EBP-COQ Prof, the mean of Attitudes was 3.9 (SD = 0.6), Knowledge was 3.1 (SD = 0.8), Skills was 3.7 (SD = 0.6), and Utilization was 3.4 (SD = 0.7) [Figure 1].

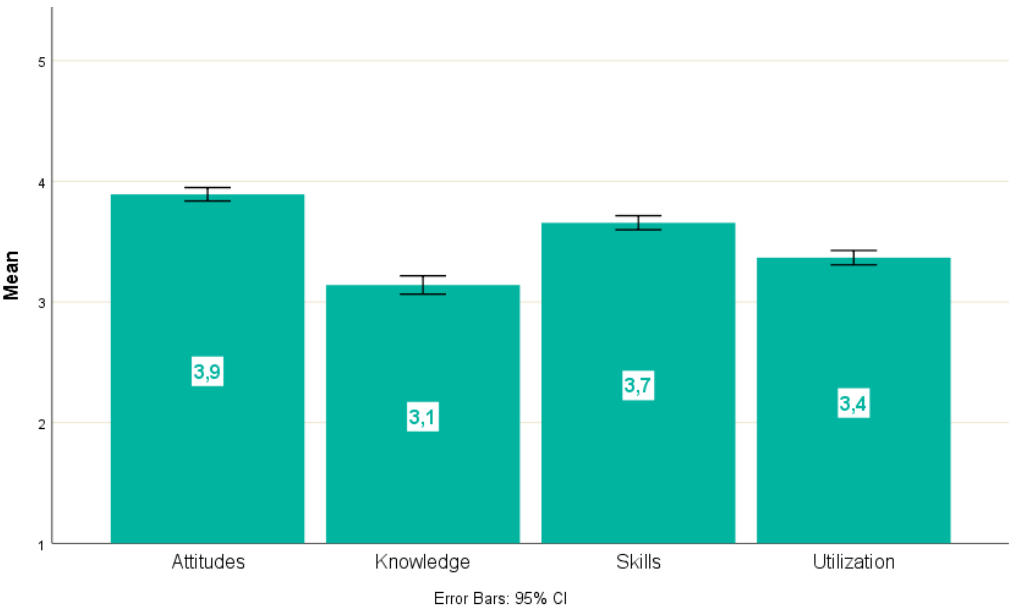


Figure 1. Mean value of EBP-COQ Prof (Attitudes, Knowledge, Skills, and Utilization).

The subscales Attitudes (8 items; $\alpha = 0.89$), Knowledge (11 items; $\alpha = 0.94$), Skills (6 items; $\alpha = 0.82$), and Utilization (10 items; $\alpha = 0.87$) were found to be highly reliable.

3.1.1. Correlations of EBP-COQ Prof subscales

3.1.1.1. Bivariate analysis

The **Table 2** summarizes the results of the correlations of the subscales of the EBP-COQ Prof questionnaire with the studied factors. According to the results, older ages correspond to higher values of Skills' ($r = 0.153$, $p = 0.001$) and Utilization's ($r = 0.132$, $p = 0.004$) subscale. The level of Attitudes ($t = -4.86$, $p < 0.001$), Knowledge ($t = -9.17$, $p < 0.001$), Skills ($t = -5.29$, $p < 0.001$), and Utilization ($t = -3.29$, $p < 0.001$) were statistically significant higher for nurses who have a master's degree than nurses who haven't. Moreover, the level of Attitudes ($t = -3.87$, $p < 0.001$), Knowledge ($t = -6.50$, $p < 0.001$), and Skills ($t = -4.00$, $p < 0.001$) were statistically significant higher for nurses who have written at least one academic or professional nursing article in the last 5 years than nurses who haven't. higher level of computer knowledge corresponds to higher values of Attitudes' ($rpb = 0.138$, $p = 0.003$), Knowledge ($rpb = 0.290$, $p < 0.001$), Skills' ($rpb = 0.161$, $p < 0.001$), and Utilization's ($rpb = 0.113$, $p = 0.015$) subscale. More years of nursing experience corresponds to higher values of Skills' ($r = 0.179$, $p < 0.001$) and Utilization's ($r = 0.140$, $p = 0.002$) subscale. The level of Attitudes ($t = -3.25$, $p = 0.001$), Knowledge ($t = -3.72$, $p < 0.001$), Skills ($t = -2.88$, $p = 0.004$), and Utilization ($t = -4.32$, $p < 0.001$) were statistically significant higher for nurses who works in a university clinic. English language knowledge were significant higher in the level of attitude ($rpb=469$, $p = 0.012$), knowledge ($rpb=469$, $p < 0.001$), and skills ($rpb=469$, $p = 0.012$) subscale. The findings revealed no significant correlation between biological sex and EBP-COQ Prof subscales.

Table 2. Correlations of the subscales of the EBP-COQ Prof questionnaire with the studied factors.

	Attitudes	Knowledge	Skills	Utilization
Age	$r(473) = -0.026$, $p = 0.814$	$r(473) = -0.011$, $p = 0.814$	$r(473) = 0.153$, $p = 0.001$	$r(473) = 0.132$, $p = 0.004$
Biological sex	$t(471) = -1.448$, $p = 0.148$	$t(471) = 1.857$, $p = 0.064$	$t(471) = 0.045$, $p = 0.964$	$t(471) = -0.616$, $p = 0.538$
Possession of a master's degree	$t(470) = -4.862$, $p < 0.001$	$t(470) = -9.169$, $p < 0.001$	$t(470) = -5.289$, $p < 0.001$	$t(470) = -3.294$, $p < 0.001$
Writing academic/professional nursing articles in the last 5 years	$t(471) = -3.870$, $p < 0.001$	$t(471) = -6.496$, $p < 0.001$	$t(471) = -4.003$, $p < 0.001$	$t(471) = -1.939$, $p = 0.053$
Level of English language knowledge	$rpb(469) = 0.116$, $p = 0.012$	$rpb(469) = 0.257$, $p < 0.001$	$rpb(469) = 0.116$, $p = 0.012$	$rpb(469) = 0.064$, $p = 0.169$
Level of computer knowledge	$rpb(469) = 0.138$, $p = 0.003$	$rpb(469) = 0.290$, $p < 0.001$	$rpb(469) = 0.161$, $p < 0.001$	$rpb(469) = 0.113$, $p = 0.015$
Years of nursing experience	$r(466) = 0.010$, $p = 0.822$	$r(466) = -0.003$, $p = 0.951$	$r(466) = 0.179$, $p < 0.001$	$r(466) = 0.140$, $p = 0.002$
Work in a university clinic	$t(466) = -3.253$, $p = 0.001$	$t(466) = -3.718$, $p < 0.001$	$t(466) = -2.883$, $p = 0.004$	$t(466) = -4.324$, $p < 0.001$

3.1.1.2. Multivariable analysis

The multiple regression model statistically significantly predicted the subscale Attitudes, $F(6, 457) = 7.163$, $p < .001$, adj. $R^2 = 0.074$. The variables "Master's degree" ($p = 0.003$), "Work in a university clinic" ($p = 0.008$), and "Writing academic/professional nursing articles in the last 5 years" ($p = 0.024$) added statistically significantly to the prediction. Regression coefficients and standard errors are presented in **Table 3**.

Table 3. Multiple regression results for Attitudes.

Model Dependent variable = Attitudes	Unstandardized Coefficients		t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error			Lower Bound	Upper Bound
(Constant)	3.322	.178	18.642	.000	2.972	3.672
Biological sex	.148	.078	1.905	.057	-.005	.300
Master's degree	.210	.069	3.039	.003	.074	.347
Writing academic/professional nursing articles in the last 5 years	.211	.093	2.271	.024	.028	.393
English language knowledge	.007	.046	.151	.880	-.083	.097
Computer knowledge	.075	.051	1.469	.142	-.025	.175
Work in a university clinic	.153	.058	2.647	.008	.039	.266

The multiple regression model statistically significantly predicted the subscale Knowledge, $F(6, 457) = 23.306$, $p < .001$, adj. $R^2 = 0.224$. The variables "Master's degree" ($p < 0.001$), "Writing academic/professional nursing articles in the last 5 years" ($p = 0.001$), "Computer knowledge" ($p = 0.002$), and "Work in a university clinic" ($p = 0.006$) added statistically significantly to the prediction. Regression coefficients and standard errors are presented in detail in Table 4.

Table 4. Multiple regression results for Knowledge.

Model Dependent variable = Knowledge	Unstandardized Coefficients		t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error			Lower Bound	Upper Bound
(Constant)	2.551	.223	11.436	.000	2.112	2.989
Biological sex	-.102	.097	-1.055	.292	-.293	.088
Master's degree	.533	.087	6.148	.000	.363	.703
Writing academic/professional nursing articles in the last 5 years	.396	.116	3.409	.001	.168	.625
English language knowledge	.067	.057	1.164	.245	-.046	.180
Computer knowledge	.195	.064	3.058	.002	.070	.321
Work in a university clinic	.201	.072	2.789	.006	.059	.343

The multiple regression model statistically significantly predicted the subscale Skills, $F(7, 449) = 9.598$, $p < .001$, adj. $R^2 = 0.117$. The variables "Computer knowledge" ($p = 0.002$), "Master's degree" ($p = 0.011$), "Writing academic/professional nursing articles in the last 5 years" ($p = 0.019$), and "Work in a university clinic" ($p = 0.028$) added statistically significantly to the prediction. Table 5 presents the regression coefficients and standard errors.

Table 5. Multiple regression results for Skills.

Model Dependent variable = Skills	Unstandardized Coefficients		t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error			Lower Bound	Upper Bound
(Constant)	2.820	.253	11.124	.000	2.322	3.318
Age	.004	.007	.564	.573	-.009	.016
Master's degree	.185	.073	2.541	.011	.042	.329

Writing academic/professional nursing articles in the last 5 years	.226	.096	2.351	.019	.037	.415
English language knowledge	.005	.048	.100	.921	-.089	.098
Computer knowledge	.169	.055	3.098	.002	.062	.276
Years of nursing experience	.011	.006	1.898	.058	.000	.023
Work in a university clinic	.133	.060	2.203	.028	.014	.251

The multiple regression model statistically significantly predicted the subscale Utilization, $F(7, 449) = 6.299$, $p < .001$, adj. $R^2 = 0.075$. The variables "Work in a university clinic" ($p < 0.001$) and "Computer knowledge" ($p = 0.017$) added statistically significantly to the prediction. Regression coefficients and standard errors can be found in Table 6.

Table 6. Multiple regression results for Utilization.

Model Dependent variable = Utilization	Unstandardized Coefficients		t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error			Lower Bound	Upper Bound
(Constant)	2.457	.265	9.264	.000	1.936	2.978
Age	.011	.007	1.544	.123	-.003	.024
Master's degree	.113	.076	1.487	.138	-.036	.263
Writing academic/professional nursing articles in the last 5 years	.093	.101	.922	.357	-.105	.290
English language knowledge	-.010	.050	-.207	.836	-.108	.088
Computer knowledge	.137	.057	2.404	.017	.025	.249
Years of nursing experience	.003	.006	.407	.684	-.010	.015
Work in a university clinic	.243	.063	3.856	.000	.119	.367

4. Discussion

In this study, the Greek version of the EBP-COQ Prof questionnaire was used, which consists of 35 statements and is a reliable tool [19], to investigate the competency of the nurses of the national health system in Greece (NHS) in terms of attitude, skills, knowledge as well as the utilization of EBP in daily clinical practice. The study was conducted using a convenience sample of 473 nurses working in 10 hospitals. The mean age of 473 participants (402 women and 71 men) was 44.7 ± 9.2 years old. Our results show that the nursing staff presents a positive attitude with a mean of 3.9 ($SD = 0.6$) and skills of 3.7 ($SD = 0.6$), as it presents lower values in utilization with 3.4 ($SD = 0.7$) and knowledge with 3.1 ($SD = 0.8$). The factors influencing these variables are "Master's degree" ($t=3.039$, $p=0.003$), "Writing an academic article" (3.409, $p=0.001$), "Working in a University clinic" (2.203, $p=0.028$) and, "Computer Skills" (2.404, $p=0.017$).

However, in research conducted in Spain by Ramos et al. (2021), using the same questionnaire in Spanish version [15,16], the majority of nurses showed a higher mean for attitude, followed by skills, and lower for the dimensions of knowledge and utilization. These findings are similar to our study, but there is a difference in the dimension of knowledge which is higher than utilization [16]. Perhaps this is due to the high percentage of participants with master and doctoral degrees in Spain study. According to the results of other research, it seems that nurses worldwide lack EBP readiness. Although there is a positive attitude and recognize the significance of the value of EBP [22-25], on the other hand, there is a lack of competency, knowledge, and skills for implementation towards EBP [6,22,26,27]. In China, in 2019, a survey of manager nurses reported a positive attitude towards EBP but rarely implemented it due to lack of knowledge [28]. According to Saunders et al. (2017) due to this lack of knowledge, it was not able to recognize when EBP was being used in clinical practice [29]. Another common finding of many studies, as in the present one, is the low implementation of EBP

[29-35]. Unexpectedly, the research findings by Aynalem et al. (2021) showed that 48.9% of the participants had an unfavorable attitude toward EBP, and 21.6% stated that they did not wish to use EBP in their clinical practice [30]. A negative attitude was also seen in other studies [36,37].

The present study studied the variables related to attitude, knowledge, skills, and utilization in terms of EBP. Regarding age, it seems not to have any significant correlation with our subscales. In contrast, in a previous study, it was stated that participants younger than 30 years old had a significant correlation with the competency of EBP ($t=2.163$, $P<0.05$) [38].

In our study, a factor that significantly affects the subscales is the level of education. Based on the findings, the higher the educational level, the higher the subscale score. Therefore, nurses who possess master's or doctorate degrees have a positive attitude and better knowledge and skills than those who possess a bachelor's degree. This is also confirmed in previous studies from the literature [6,16,37,39]. Nevertheless, surprisingly to the result of a study conducted in Saudi Arabia, the level of education does not have a positive influence in terms of attitude, knowledge, and utilization [40].

This study revealed that nursing staff with a higher level of computer skills corresponds to higher values of knowledge, Skills', and utilization subscale. The results of the present study share a number of similarities with Patelarou et al. (2021), who showed that nursing students who had good computer skills were found to influence their perceptions of EBP positively, the median value in the VAS scale was (median=7.0) [18]. In addition to other research in the literature, it can distinguish that the use and accessibility of a computer significantly affect the utilization of EBP [30,41].

Our survey has no correlation between the years of nursing experience and subscales, Tomotaki et al. (2020) stated that the years of working experience are not necessary to have a correlation with EBP competency [6]. Farokhzadian et al. (2015) support the idea that the working experience helps to be confident using EBP in daily clinical practice [36]. However, this study has not confirmed previous research that stated that nursing staff with fewer years of professional experience had better utilization of EBP [30]. Remarkably, a negative correlation was reported, in the survey conducted by Heydari et al. (2014), revealing that the working experience affects the knowledge, skills, and utilization negatively of EBP [37].

Another parameter that is related to and affects our variables is the level of attitude, knowledge, skills, and utilization, which is statically significantly higher for nurses who work in a university clinic than nurses not working in a clinic. This concurs well with previous findings in the literature that show a significant difference depending on the type of hospital and wards where the nurses work [37,38].

According to our study results, the attitude, knowledge, and skills level was statistically higher for nurses who have written at least one academic or professional nursing article in the last five years than those who have not. The results of this study are consistent with previous studies that stated that there was a positive correlation with the competency of EBP. Spanish researchers found that reading scientific articles increased the competency of EBP [16]. Tomotaki et al. (2020) found that those conducting research are positively related to attitude, knowledge, and skills toward EBP [6]. Moreover, Yoo et al. (2019) showed that involvement in the research positively affects the utilization of the EBP [39]. In addition, the research of Alqahtani et al. (2020) showed a positive correlation between knowledge and conducting research [40].

Our results show that the English language level had not any significant correlation with attitude, knowledge, skills, and utilization. At this point, Patelarou et al. (2021) revealed in their study that the higher the knowledge of the English language, the less perception there is toward EBP (median=8.0 on the VAS scale) [18].

The analysis did not identify any significant differences in the variables that can affect the biological sex regarding attitude, knowledge, skills, and utilization. These findings are in complete agreement with the study conducted by Heydari et al. (2014) [37]. The most surprising is that the survey conducted by Patelarou et al. (2021) stated that men had higher mean values regarding knowledge and skills in EBP (28.2 ± 4.3) compared with women (26.1 ± 5.3) [18].

5. Strengths and limitations of the study

It is noteworthy that no other scale has been used in the Greek language that can investigate and assess the competence of nurses in the NHS toward EBP. This is the first study revealing results about Greek nurses' attitudes, skills, knowledge and utilization. The questionnaire is self-administered, and therefore there should be a degree of caution as to the validity of the responses, but a sufficiently large sample and convenience sampling tend to eliminate this disadvantage.

6. Conclusion

The study reveals that Greek NHS nurses have a positive attitude, moderate levels of skills and lower levels of utilization and knowledge. The factors influencing these variables are educational level, writing an academic article in the last five years, level of computer knowledge as well as the type of clinic they work. The limited literature in the Greek area around the specific subject confirms the requirement for further research in order to identify the needs. For this reason, educational programs should be developed that will aim at continuous training to enhance and improve the appropriate culture and guarantee a favorable climate towards EBP.

Author Contributions: Conceptualization, S.S. and A.P.; methodology, A.P.; formal analysis, S.S. and A.P.; investigation, data curation, S.S., K.G., and A.P.; writing-original draft preparation, S.S., E.P., and A.P.; writing-review and editing, S.S., E.P., K.G., C.K. and A.P.; supervision, A.P. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: This research has been approved by the Hellenic Mediterranean University Ethics Committee. Respondents were informed by an information sheet about the purpose of the research, asking them to give their full consent for participation. The whole research respects the dignity of the participants, protects their privacy and anonymity, and ensures an adequate level of confidentiality. The data were used only for the purpose of the present study.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

Public Involvement Statement: No public involvement in any aspect of this research.

References

1. Melnyk, B. M., Gallagher-Ford, L., Zellefrow, C., Tucker, S., Thomas, B., Sinnott, L. T., & Tan, A. (2018). The First U.S. Study on Nurses' Evidence-Based Practice Competencies Indicates Major Deficits That Threaten Healthcare Quality, Safety, and Patient Outcomes. *Worldviews on evidence-based nursing*, **2018**, 15(1), 16–25. <https://doi.org/10.1111/wvn.12269>
2. Melnyk, B. M., Gallagher-Ford, L., Long, L. E., & Fineout-Overholt, E. (2014). The establishment of evidence-based practice competencies for practicing registered nurses and advanced practice nurses in real-world clinical settings: proficiencies to improve healthcare quality, reliability, patient outcomes, and costs. *Worldviews on evidence-based nursing*, **2014**, 11(1), 5–15. <https://doi.org/10.1111/wvn.12021>
3. Sackett, D. L., Rosenberg, W. M., Gray, J. M., Haynes, R. B., & Richardson, W. S. Evidence based medicine. *BMJ: British Medical Journal*, **1996**, 313(7050), 170.
4. Kim, S. C., Ecoff, L., Brown, C. E., Gallo, A. M., Stichler, J. F., & Davidson, J. E. Benefits of a Regional Evidence-Based Practice Fellowship Program: A Test of the ARCC Model. *Worldviews on evidence-based nursing*, **2017**, 14(2), 90–98. <https://doi.org/10.1111/wvn.12199>
5. American Nurses Association, "Nursing. Scope and standards of practice," Washington, 2010, p. 3rd ed.
6. Tomotaki, A., Fukahori, H., & Sakai, I. Exploring sociodemographic factors related to practice, attitude, knowledge, and skills concerning evidence-based practice in clinical nursing. *Japan journal of nursing science : JJNS*, **2020**, 17(1), e12260. <https://doi.org/10.1111/jjns.12260>
7. Patelarou, A. E., Mechili, E. A., Ruzafa-Martinez, M., Dolezel, J., Gotlib, J., Skela-Savič, B., Ramos-Morcillo, A. J., Finotto, S., Jarosova, D., Smodiš, M., Mecugni, D., Panczyk, M., & Patelarou, E. Educational

- Interventions for Teaching Evidence-Based Practice to Undergraduate Nursing Students: A Scoping Review. *International journal of environmental research and public health*, **2020**, 17(17), 6351. <https://doi.org/10.3390/ijerph17176351>
8. Patelarou, A. E., Kyriakoulis, K. G., Stamou, A. A., Laliotis, A., Sifaki-Pistolla, D., Matalliotakis, M., Prokopakis, E., & Patelarou, E. Approaches to teach evidence-based practice among health professionals: an overview of the existing evidence. *Advances in medical education and practice*, **2017**, 8, 455–464. <https://doi.org/10.2147/AMEP.S134475>
 9. Gorsuch, C. R. P. F., Gallagher Ford, L., Koshy Thomas, B., Melnyk, B. M., & Connor, L. Impact of a Formal Educational Skill-Building Program Based on the ARCC Model to Enhance Evidence-Based Practice Competency in Nurse Teams. *Worldviews on evidence-based nursing*, **2020**, 17(4), 258–268. <https://doi.org/10.1111/wvn.12463>
 10. Dolezel, J., Zelenikova, R., Finotto, S., Mecugni, D., Patelarou, A., Panczyk, M., Ruzafa-Martínez, M., Ramos-Morcillo, A. J., Skela-Savič, B., Gotlib, J., Patelarou, E., Smodiš, M., & Jarosova, D. Core Evidence-Based Practice Competencies and Learning Outcomes for European Nurses: Consensus Statements. *Worldviews on evidence-based nursing*, **2021**, 18(3), 226–233. <https://doi.org/10.1111/wvn.12506>
 11. Fiset, V. J., Graham, I. D., & Davies, B. L. (2017). Evidence-Based Practice in Clinical Nursing Education: A Scoping Review. *The Journal of nursing education*, **2017**, 56(9), 534–541. <https://doi.org/10.3928/01484834-20170817-04>
 12. Kyriakoulis, K., Patelarou, A., Laliotis, A., Wan, A. C., Matalliotakis, M., Tsiou, C., & Patelarou, E. Educational strategies for teaching evidence-based practice to undergraduate health students: systematic review. *Journal of educational evaluation for health professions*, **2016**, 13, 34. <https://doi.org/10.3352/jeehp.2016.13.34>
 13. Skela-Savič, B., Gotlib, J., Panczyk, M., Patelarou, A. E., Bole, U., Ramos-Morcillo, A. J., Finotto, S., Mecugni, D., Jarosova, D., Patelarou, E., Dolezel, J., & Ruzafa-Martínez, M. Teaching evidence-based practice (EBP) in nursing curricula in six European countries-A descriptive study. *Nurse education today*, **2020**, 94, 104561. <https://doi.org/10.1016/j.nedt.2020.104561>
 14. Melnyk B. M. Breaking Down Silos and Making Use of the Evidence-Based Practice Competencies in Healthcare and Academic Programs: An Urgent Call to Action. *Worldviews on evidence-based nursing*, **2018**, 15(1), 3–4. <https://doi.org/10.1111/wvn.12271>
 15. Ruzafa-Martínez, M., Fernández-Salazar, S., Leal-Costa, C., & Ramos-Morcillo, A. J. Questionnaire to Evaluate the Competency in Evidence-Based Practice of Registered Nurses (EBP-COQ Prof©): Development and Psychometric Validation. *Worldviews on evidence-based nursing*, **2020**, 17(5), 366–375. <https://doi.org/10.1111/wvn.12464>
 16. Ramos-Morcillo, A. J., Fernández-Salazar, S., Leal-Costa, C., & Ruzafa-Martínez, M. Evidence-based practice nurses' competency: Spanish national survey and establishment of a scale of the EBP-COQ-Prof©. *Journal of nursing management*, **2021**, 29(4), 794–804. <https://doi.org/10.1111/jonm.13220>
 17. Saunders, H., Gallagher-Ford, L., Kvist, T., & Vehviläinen-Julkunen, K. Practicing Healthcare Professionals' Evidence-Based Practice Competencies: An Overview of Systematic Reviews. *Worldviews on evidence-based nursing*, **2019**, 16(3), 176–185. <https://doi.org/10.1111/wvn.12363>
 18. Patelarou, A., Schetaki, S., Giakoumidakis, K., Lialiou, P., & Patelarou, E. Validation of the Evidence-Based Practice Competence Questionnaire for Nursing Students: A Cross-Sectional Study in Greece. *Nursing reports (Pavia, Italy)*, **2021**, 11(4), 765–774. <https://doi.org/10.3390/nursrep11040073>
 19. Schetaki, S., Patelarou, E., Giakoumidakis, K., Trivli, A., Kleisaris, C., & Patelarou, A. Translation and Validation of the Greek Version of the Evidence-Based Practice Competency Questionnaire for Registered Nurses (EBP-COQ Prof©). *Nursing reports (Pavia, Italy)*, **2022**, 12(4), 693–707. <https://doi.org/10.3390/nursrep12040069>
 20. Ruzafa-Martínez, M., Fernández-Salazar, S., Leal-Costa, C., & Ramos-Morcillo, A. J. Questionnaire to Evaluate the Competency in Evidence-Based Practice of Registered Nurses (EBP-COQ Prof©): Development and Psychometric Validation. *Worldviews on evidence-based nursing*, **2020**, 17(5), 366–375. <https://doi.org/10.1111/wvn.12464>
 21. Field, A. *Discovering statistics using IBM SPSS statistics*. Sage, **2013**.
 22. Saunders, H., & Vehviläinen-Julkunen, K. The state of readiness for evidence-based practice among nurses: An integrative review. *International journal of nursing studies*, **2016**, 56, 128–140. <https://doi.org/10.1016/j.ijnurstu.2015.10.018>

23. Patelarou, A. E., Laliotis, A., Brokalaki, H., Petrakis, J., Dafermos, V., & Koukia, E. Readiness for and predictors of evidence base practice in Greek healthcare settings. *Applied nursing research : ANR*, **2017**, 35, 64–70. <https://doi.org/10.1016/j.apnr.2017.02.003>
24. Patelarou, A. E., Dafermos, V., Brokalaki, H., Melas, C. D., & Koukia, E. The evidence-based practice readiness survey: a structural equation modeling approach for a Greek sample. *JBHI Evidence Implementation*, **2015**, 13(2), 77-86.
25. Patelarou, A. E., Patelarou, E., Brokalaki, H., Dafermos, V., Thiel, L., Melas, C. D., & Koukia, E. Current evidence on the attitudes, knowledge and perceptions of nurses regarding evidence-based practice implementation in European community settings: a systematic review. *Journal of community health nursing*, **2013**, 30(4), 230–244. <https://doi.org/10.1080/07370016.2013.838501>
26. Patelarou, A. E., Katsouli, K., Stamou, A., Vivilaki, V., Koukia, E., Sifaki-Pistolla, D., & Patelarou, E. (2017). Attitudes, knowledge, and perceptions of psychiatric nurses about evidence-based practice. *Archives of Hellenic Medicine/Arheia Ellenikes Iatrikes*, **2017**, 34(5).
27. Ahmad Mahmoud Saleh Jordanian nurses' knowledge of Evidence-Based Practice Ahmad Mahmoud Saleh . *Rawal Medical Journal*, **2023**, 48 (1), 224-227. doi:10.5459/rmj.202212201044706
28. Chen, L., Wu, Y., Zhou, C., Li, X., & Zhao, H. Value, knowledge and implementation on evidence-based practice among nurse managers in china: A regional cross-sectional survey. *Journal of nursing management*, **2020**, 28(1), 139–147. <https://doi.org/10.1111/jonm.12907>
29. Saunders, H., & Vehviläinen-Julkunen, K. Nurses' Evidence-Based Practice Beliefs and the Role of Evidence-Based Practice Mentors at University Hospitals in Finland. *Worldviews on evidence-based nursing*, **2017**, 14(1), 35–45. <https://doi.org/10.1111/wvn.12189>
30. Aynalem, Z. B., Yazew, K. G., & Gebrie, M. H. Evidence-based practice utilization and associated factors among nurses working in Amhara Region Referral Hospitals, Ethiopia. *PloS one*, **2021**, 16(3), e0248834. <https://doi.org/10.1371/journal.pone.0248834>
31. Dalheim, A., Harthug, S., Nilsen, R. M., & Nortvedt, M. W. Factors influencing the development of evidence-based practice among nurses: a self-report survey. *BMC health services research*, **2012**, 12, 367. <https://doi.org/10.1186/1472-6963-12-367>
32. Koschel, A., Cross, M., Haines, H., Ervin, K., Skinner-Louis, D., & Carbone, D. Research and evidence-based practice in a rural Victorian cohort. *Australian Journal of Advanced Nursing*, **2012**, 30(2), 13-19.
33. Mozafarpour, S., Sadeghizadeh, A., Kabiri, P., Taheri, H., Attaei, M., & Khalighinezhad, N. Evidence-based medical practice in developing countries: the case study of Iran. *Journal of evaluation in clinical practice*, **2011**, 17(4), 651–656. <https://doi.org/10.1111/j.1365-2753.2011.01642.x>
34. Paudel, K., & Isabel, L. Perceived Barriers To Use of Evidence-Based Practices Among Nurses of A Teaching Hospital. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, **2018**, 7(2), 29-35.
35. Stokke, K., Olsen, N. R., Espehaug, B., & Nortvedt, M. W. Evidence-based practice beliefs and implementation among nurses: a cross-sectional study. *BMC nursing*, **2014**, 13(1), 8. <https://doi.org/10.1186/1472-6955-13-8>
36. Farokhzadian, J., Khajouei, R., & Ahmadian, L. Evaluating factors associated with implementing evidence-based practice in nursing. *Journal of evaluation in clinical practice*, **2015**, 21(6), 1107–1113. <https://doi.org/10.1111/jep.12480>
37. Heydari, A., Mazlom, S. R., Ranjbar, H., & Scurlock-Evans, L. A study of Iranian nurses' and midwives' knowledge, attitudes, and implementation of evidence-based practice: the time for change has arrived. *Worldviews on evidence-based nursing*, **2014**, 11(5), 325–331. <https://doi.org/10.1111/wvn.12052>
38. Fu, L., Su, W., Ye, X., Li, M., Shen, J., Chen, C., Guo, Q., Ye, L., & He, Y. Evidence-Based Practice Competency and Related Factors Among Nurses Working in Public Hospitals. *Inquiry: a journal of medical care organization, provision, and financing*, **2020**, 57, 46958020927876. <https://doi.org/10.1177/0046958020927876>
39. Yoo, J. Y., Kim, J. H., Kim, J. S., Kim, H. L., & Ki, J. S. Clinical nurses' beliefs, knowledge, organizational readiness and level of implementation of evidence-based practice: The first step to creating an evidence-based practice culture. *PloS one*, **2019**, 14(12), e0226742. <https://doi.org/10.1371/journal.pone.0226742>
40. Alqahtani, N., Oh, K. M., Kitsantas, P., & Rodan, M. Nurses' evidence-based practice knowledge, attitudes, and implementation: A cross-sectional study. *Journal of clinical nursing*, **2020**, 29(1-2), 274–283. <https://doi.org/10.1111/jocn.15097>

41. Pérez-Campos, M. A., Sánchez-García, I., & Pancorbo-Hidalgo, P. L. Knowledge, Attitude, and Use of Evidence-Based Practice among nurses active on the Internet. *Investigacion y educacion en enfermeria*, **2014**, 32(3), 451–460. <https://doi.org/10.17533/udea.iee.v32n3a10>

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