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Assessment of Self-efficacy and Outcome Expectations in Evidence-based Activities for Nurses in a Newly Opened Hospital

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ABSTRACT

Background: There may be a lack of self-efficacy or confidence in some nurses in the use of evidence-based practice (EBP) especially in a new hospital with nurses who are early in their careers. The aim of this study was to measure self-efficacy and outcomes expectations of nurses in the area of EBP in a new non-replacement hospital on the Magnet® designation journey.
Methods: The study design was a cross-sectional survey using a 28-item questionnaire measuring the total level of self-efficacy in undertaking the 5 steps of EBP of direct patient care nurses.
Results: 66 surveys were returned with 6(9%) men and 60(91%) women. Years of experience and certification showed no significant differences in confidence. For all but one subscale, the median level of confidence increased as the education level increased. For total self-efficacy (p=.021) and the subscales of problem identification (p=.044), finding evidence (p=0.17), appraising evidence (p=.042), applying evidence (p=.034), and outcome expectation (p=.039) those with higher education had higher self-efficacy. Similarly, those with either research training, EBP training or literature review training all had higher self-efficacy scores than those without training. Some subscales had lower median scores than others, indicating that, nurses in general were less confident in their EBP capacities.
Discussion: As expected, all subscales showed significantly higher median confidence in the groups with EBP training, literature search training, and computer training compared to the groups without training. Consideration, as part of an orientation to a practice setting, should be made to training and education about EBP.

Keywords*: evidence-based practice, clinical nurses, self-efficacy*

INTRODUCTION

Evidence-based practice (EBP) in nursing is the integration of the best evidence, clinical expertise, and patient values and preferences with the goal of creating the best clinical outcomes (Grove, Burns, & Gray, 2013). Specifically, EBP works to stabilize and standardized healthcare practices within the context of science and best evidence resulting in high quality care (Stevens, 2013). Thus, by integrating EBP into the culture of a healthcare organization, such as a hospital, one is able to meet the demands of safety and continuous quality improvement. Yet, the ability to enculturate EBP comes not only from an organization's desire to meet these demands but the confidence or self-efficacy of direct patient care providers' ability to identify best research evidence and critically appraisal this evidence within the context of her or his clinical expertise and the individualized patient preferences.

Successful integration of EBP into the daily practices of direct patient care providers often lacks consistency due to their self-efficacy or confidence in their ability to implement EBP (Abrahamson, Arling, & Gillette, 2013). Alarmingly, previous research has

found that the reduction in self-efficacy in EBP starts at the first step of seek out best research evidence which then directly results in the lack of ability to apply evidence to practice (Abrahamson, Arling, & Gillette, 2013). Additional research has found that the hindering of EBP is compounded by direct patient care providers' inability to not only seek out best research evidence but their ability to appropriately evaluate the evidence once received (Tansey, Bezyak, Chan, Leahy, & Lui, 2014). Yet, bachelor and master prepared nurses, when assessed on their beliefs about EBP and their ability to implement it, gave higher scores to their ability to implement EBP compared to those with lower nursing education (Kaplan, Zeller, Damitio, Culbert, & Bayley, 2014). This variation and relationship of self-efficacy and education suggest that further research on their influence to direct patient care nurses' ability to apply EBP is valuable especially for a new hospital or one starting the journey of Magnet® designation both of which have a potential blank canvas regarding enculturating EBP. Therefore, the aim of this study was to explore self-efficacy and outcomes expectations of nurses in the area of EBP in a new non-replacement hospital on the Magnet® designation journey. As a secondary aim, this study contributes to further testing of the psychometric properties of the Self-efficacy in Evidence Based Practice (SE-EBP) and Outcomes Expectancy for Evidence Based Practice (OE-EBP).

METHODS

The study design was a descriptive correlational cross-sectional survey study using a 28-item questionnaire (Self-efficacy in Evidence Based Practice) designed to measure the total level of self-efficacy of the respondents in undertaking the 5 steps of EBP along with 6 subscales. Data was collected from an acute care community hospital in Southeast Florida on the Magnet® journey. The study population was direct patient care nurses in medical-surgical, intensive care, mother/baby, emergency department, and surgical services. In addition, this study was approved by the institution's IRB and participants were provided the questionnaire along with a cover letter.

The Self-efficacy in Evidence Based Practice (SE-EBP) and Outcomes Expectancy for Evidence Based Practice (OE-EBP), used to assess EBP self-efficacy, had two parts: the first part made up of 28 items combined into 5 different factors aimed at determining how confident the respondents were with various aspects of EBP (Chang & Crowe, 2011). The second part made up of 8 items grouped into a single factor aimed at determining how confident the various aspects of EBP would lead to specific outcomes (Chang & Crowe, 2011). All items were rated in an ordinal scale varying from 0 to 10 and anchored with the terms "Not confident at all" on the 0 side and "Extremely confident" on the 10 side (Chang & Crowe, 2011). Furthermore, total possible scores range from 0 to 260 (Chang & Crowe, 2011).

Original psychometric testing of the SE-EBP included content validity, construct validity, and internal consistency. Chang and Crowe (2011) estimated the construct validity through factor analysis with a Kaiser-Meyer-Olkin of 0.94, which was above the cut-off of 0.6. Internal consistency showed excellent reliability for the SE-EBP at 0.97 overall (Kline, 1999). In addition, the subscales of the SE-EBP were also in the excellent range at 0.91 for identifying problem, 0.96 for searching for the evidence, and 0.96 for implementing the evidence.

Although both SE-EBP and OE-EBP were created with the diverse aspects of evidence-based practice (five underlining factors), a preliminary exploratory factor analysis (results not shown here), in this study, did not support evidence of multiple dimensions for the OE-EBP section, indicating the theoretical justification for using one single score for that section. On the other hand, the preliminary exploratory factor analysis done on SE-EBP (results not shown here), did support evidence of multiple dimensions suggesting that the use of the five sub scores would be more appropriate for analysis of internal consistency and validity. Therefore, internal consistency was measured for each subscale for the SE-EBP section of the tool and for the total score for the OE-EBP section of the tool.

Data analysis included descriptive statistics of the demographics, 5 subscales of the SE-EBP, and the OE-EBP. Pairwise Pearson R correlational analyses were conducted to explore the relationships between the subscales of the SE-EBP and the OE-EBP. The level of significance was set at $p < 0.05$. In addition, all scores were compared using the Wilcoxon sign rank tests and the level of significance was adjusted to $p < 0.03$ using a Bonferroni correction to compensate for multiple tests. For the secondary aim of contributing to the psychometric testing of the SE-EBP and OE-ESP, internal consistency for reliability and comparative analysis, using Kruskal-Wallis or Wilcoxon rank as appropriate, to explore differences in demographics to support validity were conducted.

RESULTS

A total of 66 surveys were collected. Table 1 gives the descriptive statistics for the demographics and control variables. Specifically, there were a majority of nurses between 25-34 years old (47%) with 47(72.3%) of the sample having a BSN as their highest nursing degree. Regarding training 59(90.8%) reported receiving computer training and 43(65.2%) reported training in EBP.

Table 1

Descriptive statistics for demographic and control variables

Variable		% (n)	Missing values
Females		91.9% (60)	
Age group			
	Less than 25	1.5% (1)	
	25-34	47.0% (31)	
	35-44	31.8% (21)	
	45-54	18.2% (12)	
	55 and more	1.5% (1)	
Years of nursing experience			
	Less than 2	3.0% (2)	
	2-5	30.3% (20)	
	6-10	28.8% (19)	
	11-15	19.7% (13)	
	More than 15	18.2% (12)	
Highest nursing degree			
	Diploma	9.2% (6)	1 (1.5%)
	Certificate	7.7% (5)	
	BSN	72.3% (47)	
	MSN or higher	10.8% (7)	
Certification		42.4% (28)	
Training EBP		65.2% (43)	
Training research design		47.6% (30)	3 (4.6%)
Training literature searches		58.7% (37)	3 (4.6%)
Training use of computers		90.8% (59)	1 (1.5%)

The first subscale of the self-efficacy section, identified as *problem identification*, had a mean (± standard deviation) of 7.2 ±2.4 and a median of 8. The second subscale of the self-efficacy section, identified as *finding evidence*, had a mean (± standard deviation) of 7.3 ±2.4 and a median of 7.9. The third subscale of the self-efficacy section, identified as *appraising evidence*, had a mean (± standard deviation) of 6.5 ±2.4 and a median of 6.8. The fourth subscale of the self-efficacy section, identified as *applying evidence*, had a mean (± standard deviation) of 6.6 ±2.4 and a median of 6.9. Finally, the fifth subscale of the self-efficacy section, identified as *evaluating practice*, had a mean (± standard deviation) of 6.2 ±2.5 and a median of 7. The total score of the *outcome expectation* (OE-SEB) section had a mean (± standard deviation) of 7.0 ±2.6 and a median of 7.9. Table 2 summarizes the descriptive statistics for the various subscale scores.

The correlations between the subscales were very high and statistically significant ($p < 0.01$) (See Table 3). With an average correlation of $r = 0.865$ varying between $r = 0.787$ and $r = 0.943$. All correlation coefficients were significantly greater than 0. This indicates the subscales were very closely related to each other.

Table 2

Descriptive statistics for subscale scores (n = 66)

Subscale	Mean	SD	Median
Problem identification	7.22	2.36	8.0
Finding evidence	7.30	2.44	7.9
Appraising evidence	6.51	2.41	6.8
Applying evidence	6.64	2.37	6.9
Evaluating practice	6.24	2.53	7.0
Outcome expectation	6.97	2.58	7.9

Table 3

Pairwise correlations between subscale scores (n = 66)

	Problem Identification	Finding evidence	Appraising evidence	Applying evidence
Problem Identification				
Finding evidence	0.814*			
Appraising evidence	0.859*	0.863*		
Applying evidence	0.856*	0.819*	0.943*	
Evaluating practice	0.851*	0.787*	0.938*	0.916*

* $p < 0.01$

A comparison of the subscales scores is shown in Table 4. The results indicate that the two dimensions with which the nurses seem the most confident (highest median scores) are *problem identification* and *finding evidence*. Those two subscales do not show significant differences (mean+/-standard deviation of *problem identification* were 7.22±2.36 and *finding evidence* 7.30±2.44, z = 0.646, p = 0.518). The scale with the lowest score was the *evaluating practice* subscale (6.24±2.53) and that score was significantly lower than all other dimension score. The two subscales of *appraising evidence* (6.51±2.41) and *applying evidence* (6.64±2.37) have lower scores than *problem identification* and *finding evidence* but higher scores than *evaluating practice* (6.24±2.53).

Having previous training in EBP, research, or literature searching showed a higher level of self-efficacy in EBP. Table 5 gives the descriptive statistics

Table 2

Pairwise comparisons of median scores between subscales

	Problem Identification	Finding evidence	Appraising evidence	Applying evidence	Evaluating practice
Finding evidence	z = 0.646 p = 0.518				
Appraising evidence	z = 4.030 p < 0.001	z = 4.443 p < 0.001			
Applying evidence	z = 3.521 p < 0.001	z = 3.548 p < 0.001	z = 1.214 p = 0.225		
Evaluating practice	z = 5.275 p < 0.001	z = 4.770 p < 0.001	z = 2.235 p = 0.025	z = 3.237 p < 0.001	
Outcome expectation	z = 1.088 p = 0.277	z = 1.772 p = 0.076	z = 3.039 p = 0.002	z = 1.510 p = 0.131	z = 4.559 p < 0.001

for those without EBP training (n = 23) and those with EBP training (n = 43) on each of the subscale scores as well as the results of the Wilcoxon rank test to compare the medians of the 2 groups. As expected, all subscales showed significantly higher median confidence in the group with EBP training compared to the group without training (p<.001). Table 6 gives the descriptive statistics for those without research training (n = 33) and those with research training (n = 30) on each of the subscale scores as well as the level of significance of the comparison between groups. As expected, all subscales showed significantly higher median confidence in the group with research training compared to the group without such training (p<.001). Table 7 gives the descriptive statistics for those without literature searching training (n = 26) and those with literature searching training (n = 37) on each of the subscale scores as well as the level of significance of the comparison between groups. As expected, all subscales showed significantly higher median confidence in the group with literature searching training compared to the group without such training (p<.001).

Table 5

Differences on the subscale scores according to EBP training status

Subscale	No EBP training (mean±SD, median)	EBP training (mean±SD, median)	Test	p-value
Problem identification	5.7±2.7 6.0	8.1±1.6 8.4	z = 3.768	<0.001
Finding evidence	5.6±2.6 5.6	8.2±1.8 8.6	z = 4.044	<0.001
Appraising evidence	5.0±2.5 5.6	7.3±2.0 7.9	z = 3.576	<0.001
Applying evidence	5.1±2.1 5.3	7.5±2.0 8.0	z = 4.049	<0.001
Evaluating practice	4.7±2.4 4.8	7.1±2.2 7.8	z = 3.749	<0.001
Total self-efficacy	5.2±2.3 5.7	7.7±1.8 8.0	z = 4.092	<0.001
Outcome expectation	5.3±2.5 5.0	7.9±2.1 8.6	z = 4.062	<0.001

Table 6

Differences on the subscale scores according to research training status

Subscale	No research training (mean±SD, median)	Research training (mean±SD, median)	Test	p-value
Problem identification	6.0±2.5 6.0	8.5±1.3 8.8	z = 4.370	<0.001
Finding evidence	5.9±2.4 6.0	8.7±1.5 9.2	z = 4.687	<0.001
Appraising evidence	5.2±2.3 5.6	7.8±1.8 8.1	z = 4.387	<0.001
Applying evidence	5.3±2.2 5.5	8.1±1.8 8.6	z = 4.548	<0.001
Evaluating practice	4.9±2.3 5.0	7.6±2.2 8.3	z = 4.103	<0.001
Total self-efficacy	5.5±2.2 6.0	8.2±2.3 8.4	z = 4.873	<0.001
Outcome expectation	5.6±2.6 5.8	8.2±1.9 8.8	z = 4.154	<0.001

Table 7

Differences on the subscale scores according to literature searching training status

Subscale	No literature searching training (mean±SD, median)	Literature searching training (mean±SD, median)	Test	p-value
Problem identification	5.7±2.6 6.0	8.2±1.6 8.6	z = 4.112	<0.001
Finding evidence	5.4±2.4 5.6	8.5±1.5 9.0	z = 4.860	<0.001
Appraising evidence	5.0±2.4 5.3	7.5±1.5 7.9	z = 3.996	<0.001
Applying evidence	5.1±2.1 5.4	7.6±2.0 8.0	z = 4.125	<0.001
Evaluating practice	4.9±2.3 5.0	7.1±2.3 8.0	z = 3.610	<0.001
Total self-efficacy	5.2±2.3 5.7	7.9±1.7 8.1	z = 4.538	<0.001
Outcome expectation	5.3±2.6 5.1	8.0±2.0 8.8	z = 4.235	<0.001

SE-EBP and OE-EBP Psychometric Testing

The first subscale of the self-efficacy section (problem identification) comprised the first 5 items. The Cronbach alpha for this subscale was very high ($\alpha = 0.962$). The second subscale of the self-efficacy section (finding evidence) comprised items 6 to 13. The Cronbach alpha for this subscale was very high ($\alpha = 0.970$). The third subscale of the self-efficacy section (appraising evidence) comprised the items 14 to 20. The Cronbach alpha for this subscale was very high ($\alpha = 0.976$). The fourth subscale of the self-efficacy section (Applying evidence) comprised the items 21 to24. The Cronbach alpha for this subscale was very high ($\alpha = 0.972$). The fifth subscale of the self-efficacy section (evaluating practice) comprised the items 25 to 28. The Cronbach alpha for this subscale was very high ($\alpha = 0.979$). The total score of the Outcome expectation (OE-SEB) section comprised all the items of the section. The Cronbach alpha for this subscale was very high ($\alpha = 0.990$). Furthermore, it should be pointed out that all the subscales of the tool showed a left asymmetry, indicating a possible ceiling effect of the instrument. The distribution of the *problem identifica -tion* subscale is shown in Figure 1 as an example.

None of the scale scores showed significant gender differences, age group differences, nursing experience differences or certification differences. On the other hand, there were significant differences between groups of various education levels. We grouped the categories for nursing education level into 1) Diploma or certificate, 2) BSN and 3) MSN or higher (Diploma or certificate, n = 11, BSN, n = 47 and MSN or higher, n = 7). Table 8 gives the descriptive statistics for the scores by the nursing education groups on each of the subscale scores as well as the Kruskal-Wallis test comparing nursing education groups. When a Kruskal-Wallis chi-square was significant, pairwise comparisons were done at the $p<0.03$ level of significance to determine which groups differed significantly. For all subscales except the "Evaluating practice" scale, the median level of confidence increased as the education level increased. For "Problem identification", and "Appraising evidence", although the Kruskal-Wallis test indicated there were significant differences between the groups, the pairwise comparisons were not significant at the $p<0.03$ level of significance. For "Finding evidence", the pairwise comparisons between the 3 groups indicated that all 3 groups had significantly different scores, the more educated groups having larger median scores. For "Applying evidence", the pairwise comparisons between the 3 groups indicated that the most educated group (MSN or higher) had significantly larger median scores than those with a Diploma or a Certificate.

DISCUSSION

This study strongly suggests that in terms of delivering EBP-centered care, higher education levels in nursing and targeting training assist in ensuring self-efficacy in best nursing practices. This finding is in line with the findings of Chang and Crowe (2011) but not

Figure 1

Distribution of Problem identification subscale (n = 66)

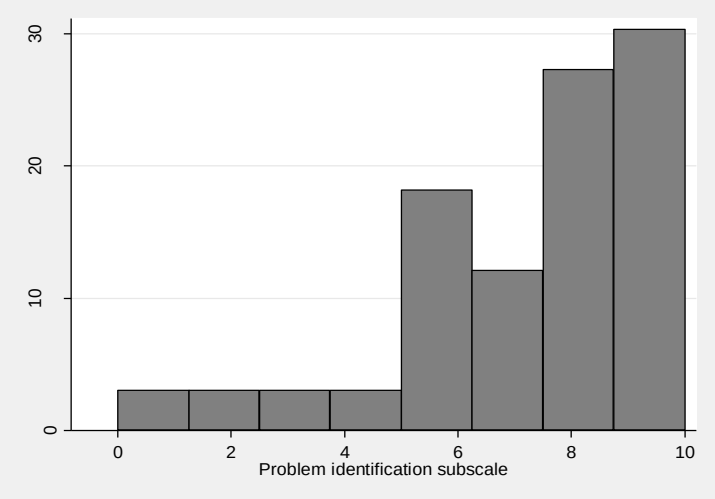

Table 8

Education differences on the subscale scores

Subscale	Dip. or Cert. (mean±SD, median)	BSN (mean±SD, median)	MSN or higher (mean±SD, median)	Test	p-value
Problem identification	6.1±2.8 6.0	7.3±2.2 8.0	8.7±1.6 9.4	$\chi^2_{2df} = 6.252$	0.044
Finding evidence	5.8±2.6 6.3	7.4±2.4 8.0	9.0±1.6 9.5	$\chi^2_{2df} = 8.146$	0.017
Appraising evidence	5.3±2.7 6.6	6.5±2.3 6.9	8.4±1.8 8.6	$\chi^2_{2df} = 6.322$	0.042
Applying evidence	5.4±2.5 5.3	6.7±2.3 7.0	8.4±1.9 9.0	$\chi^2_{2df} = 6.762$	0.034
Evaluating practice	5.2±2.8 4.5	6.3±2.4 7.0	7.7±2.5 9.0	$\chi^2_{2df} = 4.888$	0.087
Total self-efficacy	5.6±2.5 6.1	6.9±2.2 7.0	8.5±1.7 9.0	$\chi^2_{2df} = 7.699$	0.021
Outcome expectation	5.5±3.0 6.0	7.1±2.4 8.0	8.5±2.0 9.8	$\chi^2_{2df} = 6.515$	0.039

supported in the validation of other self-efficacy tools (Duprez et al., 2016) when comparing Master prepared nurses. On a daily basis, nurses make hundreds of decisions pertaining to the way in which any given patient will be cared for. These decisions need to have a strong foundation in and reflect EBP as evidenced by Chang and Crowe (2011). Nurses with educational backgrounds including bachelor's degree or higher (in nursing) are more equipped to effectively implement EBP. Much of the focus of higher learning is directed towards sifting through scholarly databases to instill a sense of what quality evidence is and where it comes from. For this reason, and similarly to what Chang and Crowe (2011) conclude, the orientation process at a Magnet designated hospital should and needs to recognize and supplement what the new-hire RN already understands or does not understand regarding EBP implementation. The 28-item questionnaire serves as a framework that can be used to assimilate new-hire nurses into the culture of an EBP-centered clinical setting. "Appraising evidence", "Applying evidence" and "Evaluating practice" ranked amongst the lowest self-efficacy scores in this study. Therefore, it can be hypothesized that if nurses were better equipped

through targeted training as to what quality EBP information looks like, and where to find it, and how to apply it, this could potentially help in bridging the gap between scholarly literature and the everyday clinical practice setting, and in doing so result in better outcome for patients.

CONCLUSION

Evidence-based practice nursing cannot be applied if it is not sought out in the first place. The educational process of a nurse does not end when a diploma is obtained and should continue within the framework of evidence-based guidelines and best practices. But this information needs to be accessible and of the highest quality. In the end, a self-efficacy questionnaire built in to the orientation process will serve to highlight where the institution can best serve its nursing population in instilling EBP guidelines.

DECLARATION OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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