Original Research Article

Pediatric Nurses' Knowledge, Perceived Barriers and Motivators Related To Evidence Based Nursing at University Children Hospitals, Egypt

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ABSTRACT

Background: Evidence based practice (EBP) is aimed at integration of best research evidence with clinical expertise, and patient values in making clinical decisions about their care. In order to improve the use of EBP in pediatric nursing there is a need for good understanding of the awareness, knowledge and attitude and perceived barriers and motivators that might affect its implementation.
Aim: to identify the pediatric nurses' knowledge, perceived barriers and motivators related to use of EBN at the University Children Hospitals in Egypt.
Materials & Methods: a descriptive cross-sectional research design on a sample of 121 bachelor-degree nurses working in the study setting. A self-administered questionnaire was used to collect data regarding nurses' knowledge and perceived barriers and motivators to practicing EBN.
Results: The results showed that the nurses' knowledge about EBP and their awareness about its resources were very low. The category of barriers with the highest score was organization (median=2.20), while the lowest was communication (median=1.8). The scores of motivators were higher than those of the barriers. Multivariate analysis showed that a higher qualification is a positive predictor of nurse's knowledge score. As for the barriers perception score, the knowledge score was a negative predictor, while working at Ain-shams hospital is a positive predictor.
Conclusion: the pediatric nurses in the study settings have a lack of experience with research and EBN, and deficient knowledge especially among those with lower qualification. The organization-related barriers are the most perceived.

Key words: Pediatric nurse, Evidence-based-Nursing, Barriers, Motivators, Evidence based practice (EBP).

INTRODUCTION

Evidence based practice (EBP) is recognized as a gold standard for quality health care and patient outcomes currently and in the future. [1-3] It can be described as the integration of best research evidence with clinical expertise, and patient values in making clinical decisions about their care. [4,5] Awareness of the latest scientific evidence and the ability to critically appraise literature and assess its applicability has been identified as integral to the application of EBP. [6,7]

The concept of evidence-based medicine (EBM) first appeared about two decades before in an attempt to reduce the gap between evidence and practice. [8] This evolution led to a new era in evidence-based nursing (EBN) that is necessary to achieve the development potentials of the nursing sciences. [9] In pediatric clinical practice, EBN is a key strategy to improve health care as it provides a framework for clinical problem solving which allows pediatric nurses to keep up-to-date with current best evidence in their practice. [10]

In order to improve the use of EBN in pediatric nursing there is a need for good understanding of the awareness, knowledge and attitude of health professionals as well as perceived barriers that might affect its implementation. [11] A number of studies have identified a range of barriers including lack of research skills and lack of confidence to implement change [12-16] in addition to organization-related barriers such as lack of organizational support, lack of motivation, and lack of leadership among managers. [17-20] On the other hand, other factors may foster the use of EBP such as educational interventions [14,21-23] that help in acquiring skills and in changing attitudes. [23] The creation of a culture enhancing the incorporation of EBN in the daily practice is also an essential motivating factor. [24-26]

Even though EBN has become a popular and mandatory tool in improving quality of care, there is still room for improvement in its implementation in clinical pediatric practice. [11] This is of special importance given that there is evidence that its use in daily practice is limited, [17] and 30-40% of the patients do not receive care based on research findings. [17] The situation is even worse in developing countries where the utilization of research in service is still suboptimal. [12-14] There is a paucity of research in these countries to identify the factors that interfere with the ability of pediatric nurses to base their practice on research evidence. Therefore this study was carried out to identify the pediatric nurses' knowledge, perceived barriers and motivators related to use of EBN at the University Children Hospitals in Egypt.

MATERIALS AND METHODS

Design and setting: A descriptive cross-sectional research design was used in carrying out this study at the Children Hospitals affiliated to Mansoura and Ain-shams universities in Egypt.

Sample: The study sample consisted of 121 bachelor-degree nurses working in the study setting: 81 from Mansoura hospital and 40 from Ain-shams hospital. The only eligibility criterion was having a bachelor degree in nursing or a higher qualification. The sample size was large enough to identify any barrier with a frequency rate of 20% with 5% absolute error at 95% level of confidence using the Epi-Info software package with population correction and compensation for a non-response rate of about 10%. Nurses were recruited through convenience sampling according to the eligibility criteria.

Tools of data collection: The researchers prepared a self-administered questionnaire to collect data regarding nurses' knowledge, perceived barriers and motivators to practicing EBN, in addition to basic personal characteristics such as age, sex, nursing qualification, and department.

The knowledge section of the questionnaire was developed based on McColl A et al. [27] The first parts included questions addressing knowledge about some research and statistical terms such as "relative Risk", "Number needed to treat", etc. The response was on a 4-point scale: "It would not be helpful to me to understand," "Don't understand but would like to," "Some understanding, and "Yes, I understand and

could explain to others." These were scored 1 to 4 respectively, and means, standard deviations, and medians were computed. The second part asked about nurse's awareness of some resources and databases for research such as "Pubmed," "Cochrane database," etc. The response was on a 4-point scale: "Unaware," "Aware but not used," "Read,"and "Used to help in clinical decision making." These were scored similar to the first part. The third part involved questions about nurse's experience with research, the use of different types of resources on a 5-point scale from "not at all" to "many times daily," the participation in research activities on a 4-point scale from "not at all" to ">3 times." It also asked about the availability of information resources at the workplace, and lastly a general question about familiarity with EBP.

The second section of the questionnaire consisted of a scale for nurse's perception of barriers to EBP adopted from Funk SG. [28] It consisted of 38 barriers and 12 motivating factors on a 4-point scale "to no extent," "to a little extent," "to a moderate extent," and "to a great extent." These are respectively scored from 1 to 4 so that a higher score indicates higher perception of barriers or motivators. The barriers are classified into four categories: a) Characteristics of the adopter of research (9 items such as "The nurse sees little benefit for self"; b) Characteristics of the organization (16 items such as "The facilities are inadequate for implementation"); c) Characteristics of the innovation or research (7 items such as "The research has not been replicated"); and d) Characteristics of the research communication (6 items such as "The research is not relevant to the nurse's practice"). The facilitator or motivators were categorized into a) Communication (2 items such as "Improving availability/accessibility of research reports") and b) Organization (10 items such as "Improving research knowledge").

Pilot study: A pilot study was carried out on 10 nurses to obtain information regarding clarity of the wording and presentation of the questionnaire, and time needed for completing the form. Since no alterations were needed according to pilot study results, the pilot study participants were included in the main study sample. The pilot study served to assess the reliability of the scales used through measuring their internal consistency. They proved to have high reliability with Cronbach alpha coefficients 0.91 for the knowledge scale, 0.96 for the barriers scale, and 0.85 for the motivator scale.

Procedure: Once official permission was granted from the administration of the hospitals, the researchers started the data collection process. They contacted each potential nurse to explain the purpose and nature of the study. Those who gave their consent were handed the forms to be filled in; this took 25-30 minutes. To ensure a high response rate, the filled forms were collected in the same setting. The fieldwork was done three days per week over a 2-month period from 15 June to 15 August 2013.

Ethical considerations: The study was approved by the ethical review committee at the Faculty of Nursing at Mansoura and Ain-shams universities. Permission to conduct the study was obtained from the study site authorities. A verbal consent was obtained from each nurse after informing her/him about the rights to refuse or withdraw, and about the confidentiality of the information obtained.

Statistical Methods:

Data entry and statistical analysis were done using SPSS 18.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard

deviations, median and interquartile range for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the developed tools through their internal consistency. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of the knowledge and barriers' perception scores, multiple linear regression analysis was used after testing for normality, and homoscedasticity, and analysis of variance for the full regression models were done. Statistical significance was considered at p-value <0.05.

RESULTS

The study sample included a majority of female nurses (92.6%), with age range 21 to 47 years (Table 1). All nurses were having a bachelor degree and 6.7% of them had a higher degree in nursing. Slightly more than two thirds of the sample was from intensive care units (61.2%), while the lowest percentage was from nursing administration (5.8%).

Table 1: Socio-demographic characteristics of nurses in the study sample (n=121)

	Frequency	Percent
Gender:		
Female	112	92.6
Male	9	7.4
Age:		
<30	61	50.4
30+	60	49.6
Range	21.0-47.0	
Mean±SD	29.9±5.8	
Median	29	
Nursing qualification:		
Bachelor	113	93.3
Higher	8	6.7
Department:		
Medical-surgical	23	19.0
Intensive care	74	61.2
Nursing administration	7	5.8
Others (emergency, dialysis)	17	14.0

According to Table 2, very low percentages of the nurses were often/ regularly looking for information in different types of sources, especially in journal articles and hospital library (2.5%). As for nurses' participation in research, only approximately one-fourth reported such activities. Concerning the availability of resources, only less than one third (28.1%) reported the availability of online resources. Overall, only 21.5% of the nurses reported familiarity with EBP.

Table 2: Overall experience with research and evidence as reported by nurses in the study sample (n=121)

	Often/ regularly		Score (max=4)				
	No.	%	Mean	SD	Median	1st qrt	3rd qrt
Looking for information in:							
Reference text/ manual	7	5.8	0.8	1.0	1.0	0.0	1.0
Research report	5	4.1	0.6	0.9	0.0	0.0	1.0
Journal article	3	2.5	0.4	0.8	0.0	0.0	1.0
Hospital library	3	2.5	0.3	0.7	0.0	0.0	0.0
Research activities:							
Participated in research	27	22.3	0.8	0.9	0.0	0.0	1.0
Participated in guideline development	28	23.1	0.8	1.0	1.0	0.0	1.0
Participated in solution of research problems	25	20.7	0.8	0.9	0.0	0.0	1.0
Availability or resources:							
Print material	61	50.4	1.2	0.9	2.0	0.0	2.0
Online resources	34	28.1	0.9	0.9	1.0	0.0	2.0
Other information resources	46	38.0	1.0	0.9	1.0	0.0	2.0
Overall familiarity with EBP	26	21.5	2.0	1.3	2.0	1.0	3.0

Table 3 illustrates that the nurses' knowledge about EBP was very low. The percentages of nurses who reported understanding of the different related terms ranged between 20.7% for meta-analysis to 46.3% for clinical effectiveness. The median score for understanding all terms was 2,

corresponding to "Don't understand but would like to."

<p style="text-align:center">Table 3: Knowledge about Evidence Based Practice (EBP) terms as reported by nurses in the study sample (n=121)</p>

	Understand		Score (max=4)				
	No.	%	Mean	SD	Median	1stqrt	3rdqrt
Relative risk	44	36.4	2.3	1.0	2.0	2.0	3.0
Absolute risk	38	31.4	2.2	0.9	2.0	2.0	3.0
Systematic review	33	27.3	2.2	0.9	2.0	2.0	3.0
Odds ratio	37	30.6	2.2	0.9	2.0	2.0	3.0
Meta analysis	25	20.7	2.1	0.8	2.0	2.0	2.0
Clinical effectiveness	56	46.3	2.4	0.9	2.0	2.0	3.0
Number needed to treat	51	42.1	2.4	0.9	2.0	2.0	3.0
Confidence interval	40	33.1	2.2	0.8	2.0	2.0	3.0
Heterogeneity	39	32.2	2.2	0.8	2.0	2.0	3.0
Publication bias	36	29.8	2.1	0.9	2.0	1.0	3.0

As regards nurses' awareness of EBP resources, Table 4 demonstrates very low percentages of those reporting being aware of or having used these resources. Thus, only 1 (0.8%) nurse was aware of the Bondelier database. On the other hand, the highest percentage of awareness was about the PubMed resource, but it was as low as 14.9%. The median scores for all resources was "0" corresponding to "unaware."

<p style="text-align:center">Table 4: Knowledge about Evidence Based Practice (EBP) resources as reported by nurses in the study sample (n=121)</p>

	Aware/used		Score (max=3)				
	No.	%	Mean	SD	Median	1stqrt	3rdqrt
Bandolier (published in Oxford)	1	0.8	0.3	0.6	0.0	0.0	0.0
Evidence Based Medicine (from the BMJ publishing group)	5	4.1	0.5	0.8	0.0	0.0	1.0
Effective Health Care Bulletins (from York)	5	4.1	0.6	0.9	0.0	0.0	1.0
PubMed (NCBI)	18	14.9	0.7	1.1	0.0	0.0	1.0
Cochrane database of Systematic Reviews (part of Cochrane library)	10	8.3	0.5	0.9	0.0	0.0	1.0
Database of abstracts of reviews of effectiveness (DARE) (another part of Cochrane library)	5	4.1	0.5	0.9	0.0	0.0	1.0
Evidence Based Purchasing (R&D, Bristol)	6	5.0	0.6	0.9	0.0	0.0	1.0

Table 5 summarizes the scores of nurses' opinions about the barriers and motivators, in addition to their knowledge. It shows that the category of barriers with the highest score was organization (median=2.20), while the lowest was communication (median=1.8). The scores of motivators were higher than those of the barriers, with median 2.50. As for the knowledge scores, they were very low regarding the EBP resources with median 0.30.

From Table 6, it is evident that the nurses' knowledge about EBP terms and resources had weak statistically significant positive correlations with their qualification. Meanwhile, the familiarity with EBP had a weak statistically significant negative correlation with the score of motivators, and a weak statistically significant positive correlation with the knowledge of EBP terms.

Table 5: Scores of nurses' reported EBP barriers, motivators, and knowledge

	Range	Mean±SD	Median
Barriers:			
Adopter	0.7-3.0	1.9±0.6	2.00
Organization	0.6-3.0	2.1±0.6	2.20
Innovation (research)	0.3-3.0	2.0±0.7	2.10
Communication	0.6-3.0	1.9±0.7	1.80
Total	0.5-3.0	2.0±0.6	1.90
Motivators:			
Communication	0.0-3.5	2.0±0.9	2.50
Organization	0.0-3.2	2.2±0.9	2.50
Total	0.0-3.3	2.2±0.8	2.50
Knowledge:			
Terms	1.0-3.6	2.2±0.6	2.30
Sources	0.0-2.4	0.5±0.6	0.30

Multivariate analysis (Table 7) indicates that a higher qualification is a positive predictor of nurse's knowledge

score, whereas working at Ain-shams hospital is a negative predictor. These two variables explain 14% of the variation in the knowledge score. As for the barriers perception score, the table shows that the knowledge score is a negative predictor, while working at Ain-shams hospital is a positive predictor. These two variables explain 24% of the variation in the knowledge score.

Table 6: Correlation between nurses' scores of EBP barriers, motivators, knowledge,

Scores	Spearman's rank correlation coefficient		
	Age	Qualification	EBP familiarity
Barriers	0.03	-0.06	-0.12
Motivators	0.09	-0.01	-.249**
Knowledge of terms	0.00	.246**	.289**
Knowledge of resources	0.00	.209*	0.09

(*) Statistically significant at p<0.05(**) Statistically significant at p<0.01Non-Significant at p.>0.05

Table 7: Best fitting multiple linear regression model for the knowledge and barriers perception scores

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std. Error				Lower	Upper
Knowledge score							
Constant	-1.02	0.86		-1.19	0.24	-2.72	0.68
Hospital (Ain-shams)	-0.39	0.12	-0.30	-3.39	<0.001*	-0.16	-0.62
Higher qualification	0.40	0.17	0.20	2.31	0.020	0.06	0.74
r-square=0.14	Model ANOVA: F=7.27, p<0.001						
Variables entered and excluded: age, sex							
Barriers perception score							
Constant	2.89	0.17		17.08	<0.001*	2.56	3.23
Hospital (Ain-shams)	0.48	0.10	0.39	4.75	<0.001*	0.68	0.28
Knowledge score	-0.23	0.08	-0.24	-2.98	<0.001*	-0.38	-0.08
r-square=0.24	Model ANOVA: F=19.99, p<0.001						
Variables entered and excluded: age, sex, qualification							

(*)Significant p <0.001Non-Significant at p>0.05

DISCUSSION

Pediatric nurses need to embrace new and innovative techniques to provide effective and best possible treatment for children and their families. [3] However, the uptake of evidence in practice remains a challenge for healthcare professionals including nurses. [23] This study aim was to identify the pediatric nurses' knowledge, perceived barriers and motivators related to use of EBP at University Children Hospitals. The findings point to generally low utilization of EBN in their practice, with many identified barriers and motivators.

The present study assessed nurses' knowledge regarding some terms used in the research jargon which are key elements in EBN practice as stressed by. [23] This was essential since the assessment of EBN knowledge can be used to measure the extent to which nurses are prepared to use it and to assess the effects of related education.

[29] The study findings showed that only a few of the participating nurses had good understanding of the terms commonly used in research. The results show that at least one-half of them do not understand these terms but would like to. Although this reflects deficiency of knowledge, it indicates at the same time an interest and willingness to learn, which is essential particularly in an adult-learning issue such as EBN. In agreement with these results, [30] reported low levels of knowledge about EBN among Australian nurses although, as in our study, they had positive attitudes.

On the same line, [31] demonstrated that American nurses value EBN and research and are eager to fill the gap in their practice attributed to their related deficient knowledge and skills. Similarly, [11] found that pediatric nurses had deficient information searching skills and limited familiarity with EBP, which hamper its

implementation. Furthermore, [11] attributed such lack of knowledge of commonly used EBN terms among nurses to the fact that the nursing curricula often do not give emphasis to research. Such unfamiliarity with research terminology could be a serious barrier to application of EBN. [3]

When the present study nurses were asked about their experience and practice of EBN, very few of them reported using relevant scientific resources, which indicates their dependence on own and peers' experience. This might be attributed to the lack of such resources as reported by the majority of them. At the same time, their participation in research activities was very low, which may explain their deficient knowledge about the jargon and the known formal resources. In agreement with these findings, [32] in a study of the use of evidence-based data in practice in Canada reported that nurses still do not usually use evidence-based knowledge in their clinical practice, and seldom go back to the literature to look for answers to their clinical queries. Moreover, [33] found that the practice of nurses in Texas depended on their personal experience and background knowledge. Thus, [34] emphasized the importance of having effective search strategies to locate relevant resources to guide EBN.

The present study results indicate that the highest perceived category of barriers to EBN was that of organization, where –according to median value - more than half of the sample viewed the effect of the related barriers to be moderate to great. This category of barriers included factors as lack of organizational support or incentives for clinical practice development, and the resistance to make change. The differences between the nurses in the two hospitals in their knowledge and perception of barriers might be attributed to differences in the administration of each organization in

supporting EBN and creating a culture fostering it.

In agreement with the foregoing study findings concerning the barriers to EBN, [35] in reported similar barriers to EBN among nurse educators, nurse researchers, and graduate nursing students in Columbia, Canada. On the same line, [36] found that the barriers related to the setting or organization were the most perceived by Chinese nurses. Moreover, [37] in Sweden reported that the leadership of the organization is crucial for implementing EBN.

As regards the motivating factors or the facilitators of application of EBN as perceived among the current study nurses, the findings indicate that these nurses had higher perception of facilitators compared with barriers. This is commensurate with their knowledge responses which indicated their willingness to understand and know the jargon. Thus, they give more weight to facilitators than to barriers. The motivating or facilitating factors relate to organizational support in terms of more training in research knowledge, and giving rewards to use of EBN. The findings are in agreement with those reported by [36] in China.

According to the present study findings, a higher nursing qualification was correlated to better knowledge score, and it was even identified as an independent positive predictor of this score. This is attributable to the fact that in a postgraduate degree program the candidate has to conduct a thesis or some type of research work which necessitates the acquisition of some basic knowledge and skills in research methodology and statistics which are the cornerstone of EBN. In congruence with this, [38] reported about the effectiveness of postgraduate training in enhancing nurses' EBN knowledge and skills. On the same line, [23] found that a higher level of education resulted in an increased nurses'

knowledge of EBN and more use of the best available evidence for practice.

CONCLUSION

The study findings indicate that the pediatric nurses in the study settings have a lack of experience with research and EBN, and deficient knowledge of related terms and pertinent resources, especially among those with lower qualification. The organization-related barriers are the most perceived by nurses, while they have higher perception of facilitators particularly the managerial support in terms more training and rewards for using research.

Recommendations

In view of these findings, it is recommended that pediatric hospitals management should exert more efforts in implementing training program to improve nurses' EBN knowledge and skills, in making available the needed resources, and in creating an organizational culture fostering the use of EBN in nursing practice through recognition and rewards.

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