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Improving the Culture of Evidence-Based Practice at a Magnet® Hospital

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Evidence-based practice (EBP) is the foundation of quality care, but EBP is not widely adopted. This study evaluated the impact of a hospital-wide EBP nursing project on the organizational culture of a Magnet hospital. Results of pre- and postintervention surveys suggest the intervention increased the nurses' confidence in the hospital's EBP environment. Belief in EBP was related to confidence in implementing EBP in practice.

Evidence-based practice (EBP), a problem-solving approach to decision-making, serves as a foundation for quality care (Pugh, 2012). The Institute of Medicine (2007) has recommended that 90% of clinical decisions be evidence based by 2020. Hospitals recognized with the American Nurses Credentialing Center's Magnet® status are expected to foster and utilize EBP as part of the four evidence-derived Magnet® components—transformational leadership; structural empowerment; exemplary professional practice; and new knowledge, innovations, and improvements. Hospitals applying for redesignation of Magnet® recognition must demonstrate continued growth and expansion of research and EBP activities and infrastructure, which lead to improved patient care outcomes (American Nurses Credentialing Center, 2008).

Research, however, indicates that nurses adopt EBP at low rates (Cadmus et al., 2008; Melnyk, Fineout-Overholt, Gallagher-Ford, & Kaplan, 2012; Pravikoff, Tanner, & Pierce, 2005; Ross, 2010). Difficulty with implementation of EBP is referred to as "change implementation failure" among some healthcare organizations (Nembhard, Alexander, Hoff, & Ramanujam, 2009).

Little research has been done to determine the relationships between EBP beliefs, implementation, and organizational culture. The purpose of this study was to evaluate whether the organizational culture for EBP of a Magnet® hospital was affected by a hospital-wide project to increase the EBP knowledge and skills of nurses.

BACKGROUND OF THE PROBLEM

Studies suggest that nurses use peers more than published research when making decisions about EBP. A national sample survey by Pravikoff et al. (2005) revealed that less than 46% of respondents were familiar with the term EBP, 58% did not use research reports at all, and 67% always or frequently sought information from a colleague rather than a text or journal. A replication study conducted in one state revealed 61% of respondents frequently or always used peers as the most common source of information and 44% never used research (Cadmus et al., 2008). In a study of perianesthesia nurses, 60% of respondents frequently used colleagues or peers as a source of information (Ross, 2010).

Although nurses believe EBP is important, they do not routinely demonstrate it. A recent national survey assessed the use of EBP among nurses. Although 54% of respondents agreed or strongly agreed that EBP is used in their organization, only 35% agreed or strongly agreed that their colleagues regularly implement EBP in patient care. Just under half agreed or strongly agreed that research is used to improve patient outcomes in their organization (Melnyk et al., 2012). Findings of one study with 58 participants indicated that EBP beliefs and implementation were significantly and positively related to perceived organizational culture (Melnyk, Fineout-Overholt, Giggleman, & Cruz, 2010).

Barriers to the use of EBP are a factor in its low use. A survey of 101 nurses in Michigan identified the following perceived barriers to nurses using EBP: (a) the amount of research available is overwhelming, (b) there is insufficient time on the job to read research and implement new ideas, and (c) nurses do not have enough authority to change patient care procedures based on research evidence (Roe & Whyte-Marshall, 2012).

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Research indicates interventions can successfully change the way nurses perceive and participate in EBP. Although studies suggest nurses with stronger beliefs about EBP implement EBP to a greater extent, few identify factors that correlate with EBP implementation (Melnyk et al., 2004). A quasiexperimental study of 49 nurses who participated in an EBP educational program measured the increased implementation of and improved attitudes toward EBP among the nurses who participated. Melnyk and Fineout-Overholt's EBP Beliefs and EBP Implementation Scales were used for pre- and postintervention surveys. The intervention trained participants to be EBP champions or mentors. The study found that positive attitudes toward and use of EBP increased in the nurses who participated in the educational program. However, the study did not look at the impact the mentors had on other staff members or the hospitals' culture of EBP (Varnell, Haas, Duke, & Hudson, 2008).

Years of nursing practice and recent graduation from a nursing program may be factors that influence adoption of EBP. An observational, longitudinal Swedish study of 2,434 nurses revealed that nurses' EBP remained unchanged or stable during the first 5 years of practice. Fifty percent of newly graduated nurses seldom or never formulated a question to search for evidence-based knowledge, and just over one third of nurses seldom or never changed contributed to change by implementing current knowledge (Rudman, Gustavsson, Ehrenberg, Bostrom, & Wallin, 2012).

There is little in the literature regarding the influence of organizational culture on EBP beliefs and implementation. This study was initiated to evaluate whether the organizational culture for EBP of a 300-bed urban Magnet® hospital was affected by a hospital-wide project to increase the EBP knowledge and skills of nurses.

RESEARCH AIMS

Given that most nurses use peers or colleagues as a primary source of information, the purpose of this study was to determine if a hospital-wide EBP project would have an impact on the organization's readiness for and use of EBP. The research aims were as follows:

1. to assess the nurses' perception of the organizational culture and readiness for system-wide integration of EBP before and after an EBP project intervention;
2. to assess the EBP beliefs and implementation before and after an EBP project intervention;
3. to determine whether EBP beliefs and implementation differ by educational preparation or years of experience;
4. to determine if there is a difference in EBP beliefs and implementation between units that had a nurse participate in the EBP project intervention and those that did not; and
5. to analyze whether there is a relationship among EBP beliefs and implementation, and organizational culture.

METHODS

This quasiexperimental study utilized survey methodology. The study received IRB approval prior to initiation.

Sample

The sample population included all nurses at the Magnet® hospital where the study was conducted. Only nurses who were employees of the hospital were included; agency nurses were excluded. There were 943 nurses employed when the preintervention survey was conducted and 939 at the time of the postintervention survey. There were no incentives or payments given to the subjects.

Measures

Three scales with established validity and reliability were used.

1. The Organizational Culture and Readiness for System-Wide Integration of Evidence-Based Practice Scale measures the existence of cultural factors that influence implementation of EBP and how respondents perceive the readiness of the organization to use EBP.
2. The Evidence-Based Practice Beliefs Scale measures healthcare professionals' beliefs about EBP and their ability to implement it.
3. The Evidence-Based Practice Implementation Scale measures the extent to which healthcare professionals implement EBP (Melnyk et al., 2010).

The scales were developed and validated by *Advancing Research and Clinical Practice Through Close Collaboration* (ARCC). The scales were purchased, and ARCC created an electronic survey that included 10 customized demographic questions. The validity and internal consistency of the scales were established by ARCC (Melnyk et al., 2010).

Procedures

An electronic message with a link to an online survey was sent to all nurses at the hospital. The message stated that there was implied consent if an individual chose to participate. No identifying information was obtained, and responses were not linked to an e-mail address, assuring participant confidentiality. The initial survey occurred between October 15 and October 31, 2012. A postintervention survey of all nurses occurred between May 13 and May 27, 2013, with the same three scales used in the preintervention survey. The inclusion criterion, recruitment, and procedures were the same as for the preintervention survey.

Intervention

The intervention occurred between November 1, 2012 and May 10, 2013. The intervention had two components. The first component consisted of all nurses receiving an electronic newsletter, "Evidence-Based Practice Pearls," every 2 weeks. The one-page newsletters included discussion of research on a variety of clinical topics and information on EBP. The newsletter was also posted throughout the

TABLE 1 Sample Demographics

	Time 1					Time 2					Time 1 vs. Time 2
	Mean	*n*	*SD*	Range		Mean	*n*	*SD*	Range		Sig. (*p*)
Age	47.2	200	10.65	24	66	46.7	104	10.82	23	68	.70
Years as nurse	19.3	201	12.07	1	42	18.4	104	12.90	1	49	.53
Years at organization	10.5	199	9.32	0	36	9.4	101	9.34	0	36	.34
	Percent	*n*				Percent	*n*				
Female	92.0	201				85.0	100				.06
Role	Percent	*n*				Percent	*n*				
Staff RN	74.2	141				87.0	87				
Staff LPN	1.6	3				2.0	2				
Nurse educator	4.2	8				3.0	3				
Nurse manager	4.7	9				3.0	3				
APRN	0.5	1				0.0	0				
Other	14.7	28				5.0	5				
Total	100.0	190				100.0	100				.15
Highest nursing degree	Percent	*n*				Percent	*n*				
Diploma	5.5	11				2.9	3				
Associate	38.0	76				42.2	43				
Bachelor's	44.0	88				50.0	51				
Master's	12.5	25				4.9	5				
Total	100.0	200				100.0	102				.13
Work status	Percent	*n*				Percent	*n*				
Full time	73.1	144				73.8	76				
Part time	23.4	46				20.4	21				
Per diem	3.6	7				5.8	6				
Total	100.0	197				100.0	103				.58

Note: APRN = Advanced Practice Registered Nurse.
Continuous variables were tested using *t* test for independent samples; categorical variables were tested using chi-square.

hospital in both staff and public areas. The second component involved a cohort of primarily direct care nurses who participated in a series of EBP workshops on development, implementation, and dissemination of an EBP project. The cohort involved 11 nurses from five units in the hospital who worked alone or with a colleague to develop an EBP project. The units represented were the emergency department, orthopedics acute care, surgical acute care, medical oncology, and intermediate acute care. Each project required interaction with other nurses and stakeholders on the unit.

TABLE 2 Participant Mean and Range of Scores for the Three Scales and Time 1 Versus Time 2

	Time 1			Time 2			Sig. (*p*) for Time1 vs. Time 2
	n	Mean (*SD*)	Range	*n*	Mean (*SD*)	Range	
Organizational culture and readiness (maximum 90)	169	49.1 (12.5)	21–80	89	53.6 (13.2)	16–76	.01
EBP beliefs (maximum 80)	174	56.4 (7.9)	33–74	90	58.3 (7.5)	41–78	.07
EBP implementation (maximum 90)	155	34.3 (15.6)	18–90	79	34.9 (14.7)	18–83	.08

Examples of projects include implementation of gum chewing after surgery, use of a screening tool to reduce chemotherapy-induced nausea, and decreasing anxiety and improving pain control through education of patients with traumatic fracture who undergo surgery. The nurses disseminated the findings on their units with a poster presentation for 4 weeks and to the hospital through an oral and poster presentation as part of a nurses' week recognition. Participants in the workshops were also sponsored to attend a nursing research conference and received 20 continuing education credits. Hospital staff voted to select the best poster during the nurses' week recognition, and the winners received a trip to a national nursing conference.

Data Analysis

Frequencies were generated, and descriptive statistics were used to analyze the data and answer the research questions. Survey responses to each scale were included if an individual answered 80% of the items on the scale. Person mean substitution was used for missing responses (Downey & King, 1998). Pearson *r* correlations were used for respondents who answered all three scales to evaluate if significant relationships existed. ANOVA was used to evaluate categorical variables by scale score. Years of nursing experience and years of experience at the current hospital were both skewed toward fewer years, so both variables were analyzed by quartiles for the ANOVA.

RESULTS

A total of 207 nurses responded to the survey at Time 1 for a response rate of 21.9%. Of this total, 169 respondents (81%) met the criteria of answering at least 80% of the culture and readiness scale questions, 174 (84%) answered at least 80% of the beliefs items, and 155 (75%) answered at least 80% of the implementation scale items. The survey respondents ranged in age from 24 to 66 (mean = 47.2). Three quarters were staff nurses, and nearly half (44%) had a bachelor's degree in nursing as their highest degree. Years of practice ranged from 1 to 42 years, and the number of years as a nurse at the hospital ranged from less than 1 to 35 years. A smaller number of nurses ($n = 105$) responded to the survey at Time 2 for a response rate of 11.2%. There were no statistically significant differences in the demographics of the Time 1 and Time 2 respondents (see Table 1).

The participants reported a stronger belief in EBP and their ability to implement EBP than their reported implementation of EBP at both time periods. The mean scores for beliefs were 56.4 (Time 1) and 58.3 (Time 2), on a scale where the maximum was 80. The mean for culture and

TABLE 3 Mean Organizational Culture Scores for Intervention and Nonintervention Staff at Time 1 Versus Time 2

	Time 1		Time 2		Sig. (*p*) for Time 1 vs. Time 2
Culture score (all)	49.1	(169)	53.6	(89)	.01
Intervention group	49.9	(35)	55.6	(25)	.07
Nonintervention group	49.2	(127)	53.2	(61)	.05
Sig. (*p*) for Intervention vs. Nonintervention	.78		.44		

TABLE 4 Mean Beliefs Scores for Intervention and Nonintervention Staff and Time 1 Versus Time 2

	Time 1		Time 2		Sig. (*p*) for Time 1 vs. Time 2
Belief score (all)	56.4	(174)	58.3	(90)	.07
Intervention group	57.2	(37)	58.6	(23)	.50
Nonintervention group	56.5	(129)	58.3	(63)	.13
Sig. (*p*) for Intervention vs. Nonintervention	.61		.88		

TABLE 5 Mean Implementation Scores for Intervention and Nonintervention Staff at Time 1 Versus Time 2

	Time 1		Time 2		Sig. (*p*) for Time 1 vs. Time 2
	Mean Score	*N*	Mean Score	*N*	
Implementation score (all)	34.3	(155)	34.9	(79)	.78
Intervention group	31.5	(33)	34.0	(21)	.42
Nonintervention group	34.6	(117)	35.7	(55)	.66
Signif. (*p*) for Intervention vs. Non Intervention	.30		.66		

readiness was 49.1 (Time 1) and 53.6 (Time 2), again with a possible maximum of 80. Scores for implementation were lower: 34.3 (Time 1) and 34.9 (Time 2) on a scale where the maximum was 90.

The results of the EBP beliefs and implementation scales were compared between Time 1 and Time 2 with no statistically significant differences (mean = 56.4 vs. 58.3 for beliefs, $p = .07$; mean = 34.3 vs. 34.9, $p = .78$ for implementation). The results of the organizational culture and readiness scale not only indicated a moderate perception of the organization's support for EBP at Time 1 but also had a stronger perception at Time 2 (49.1 vs. 53.6; $p = .01$). Table 2 includes all these results.

Respondents were asked to rate how much movement there was in the organization toward an EBP culture compared to 6 months before. Only 29% reported moderate or very much movement toward an EBP culture at Time 1; however, this increased to 51% at Time 2,which was a statistically significant change ($p = .007$). Another question asked participants to rate the institution's readiness for EBP. The percentage of participants rating the hospital as ready to go or past ready increased from 23% prior to the intervention to 48% after the intervention. This was a statistically significant change ($p = .043$).

One of the aims of the study was to determine whether EBP beliefs and implementation differed by educational preparation or years of nursing experience. We found a positive relationship between EBP implementation and education ($F = 8.02$, $p < .001$). No other statistically significant relationships were revealed.

The responses of nurses working on units with colleagues who participated in the EBP project intervention were compared to nurses from other units in the hospital. There were no significant differences between the two groups within each time period for any of the scales. For culture at Time 1, the intervention versus nonintervention scores were 49.9 versus 49.2 ($p = .78$); for beliefs they were 57.2 versus 56.5 ($p = .061$), and for implementation they were 31.5 versus 34.6 ($p = .30$). Time 2 results were similar. The EBP beliefs results did not change between Time 1 and Time 2 for either group (57.2 vs. 58.6, $p = .50$ for intervention and 56.5 vs. 58.3, $p = .13$ for nonintervention group). The EBP implementation scores also did not change (31.5 vs. 34.0, $p = .42$ for intervention and 34.6 vs. 35.7, $p = .66$ for nonintervention group). However, a significantly higher organizational culture score at Time 2 was reflected within the nonintervention group (49.2 vs. 53.2, $p = .05$) but not for the intervention group (49.9 vs. 55.6, $p = .07$). These results are presented in Tables 3, 4, and 5.

Using Pearson *r* correlations, EBP beliefs and organizational culture and readiness were highly correlated ($r = .623$, $p < .001$), EBP beliefs and implementation were less highly correlated ($r = .316$, $p < .001$), and culture and readiness and implementation were slightly correlated ($r = .198$, $p = .016$). Overall, EBP beliefs were significantly correlated with both organizational readiness and implementation. In other words, ratings of EBP implementation were higher when respondents had stronger belief in EBP and perceived the organizational culture and readiness to be more aligned with the elements of EBP (see Table 6).

DISCUSSION

This study adds to the growing literature that an individual's EBP beliefs and confidence in one's ability to implement EBP are related (Melnyk et al., 2010). Respondents valued

TABLE 6 Relationships Among Organizational Culture, Beliefs, and Implementation Scales for Respondents Answering All Three Scales

	Time 1			Time 2		
	Pearson Correlation	Sig. (two-tailed)	*n*	Pearson Correlation	Sig. (two-tailed)	*n*
Culture score and beliefs score	.623	.000	146	.728	.000	75
Culture score and implementation score	.198	.016	146	.137	.241	75
Beliefs score and implementation score	.316	.000	146	.332	.004	75

EBP and felt confident in their ability to implement EBP, yet implementation scores indicate a low level of EBP implementation both at the initiation and completion of the EBP intervention. There was change from Time 1 to Time 2 that suggests the hospital's efforts to promote EBP were somewhat successful. In particular, the responses regarding the readiness of the organization for change reflect more confidence in the hospital's EBP environment at the conclusion of the intervention.

The lack of a significant difference between the intervention units and nonintervention units' scores on each of the three scales suggests that the EBP pearls distributed to all nurses may account for the effect. The lack of significant difference between the two groups may be explained by nurses on the units with projects not having been aware of their colleagues' EBP projects given different shifts and poor attendance at unit meetings where projects may have been discussed. Another possible factor may be that projects were not described to peers as an EBP project. Posters about the project were displayed on the units for a 4-week period just prior to the launch of the postintervention survey. More interactive methods may have been needed to disseminate the information.

The educational background of the participants and years of experience as a nurse were evaluated to assess if higher educational attainment increased knowledge and adoption of EBP and if more recently licensed nurses had more exposure to EBP in their nursing curricula. Only one relationship emerged: The more educated nurses gave higher scores to the implementation of EBP. This result gives partial support to our hypotheses about the effects of education on EBP implementation. The lack of a further association between education and years of experience with the EBP scales may be explained by other factors such as lack of time, limited knowledge of EBP, and organizational barriers (Brown, Wickline, Ecoff, & Glaser, 2008; Koehn & Lehman, 2008).

LIMITATIONS

The study had low response rates in both time periods, and because responses were not linked by individual each time period could represent a different set of nurse respondents. Respondents had a higher number of certifications and higher level of education than the nursing staff overall when compared to data collected for Magnet® redesignation (S. Skillman, personal communication, November 4, 2013). In all other respects, it is not known how nonresponders compare to responders, which diminishes the generalizability of the study. Fewer units were represented than anticipated, which limited the amount of influence the EBP project would have in the hospital overall. Also, the project targeted direct care nurses rather than managers, who are important to modeling and guiding EBP.

IMPLICATIONS

The findings of this study suggest that interventions need to be targeted at all levels of the organization, especially at the unit level. Managers may be particularly important as they can model and promote the use of EBP. For example, managers can respond to requests to make changes to policies and procedures by asking for the evidence to support a change. Nurse managers can assist staff to use the EBP process when requesting changes and foster a work environment that uses the EBP process to "ask, acquire, appraise, apply, and analyze" information. A communication plan for disseminating information about EBP projects can be designed to explicitly engage all staff from the onset rather than during the project.

Other studies have shown that the identification and commitment of EBP champions is one strategy to increase adoption of EBP (Melnyk et al., 2010; Melnyk & Fineout-Overholt, 2010; Rangachari, Rissing, & Rethemeyer, 2013). In many organizations, this strategy will take time and a commitment of resources to develop EBP champions. An additional strategy to increase the adoption of EBP is for nursing education programs to enhance the preparation of nurses for EBP. Healthcare organizations can then capitalize, sustain, and enhance this preparation to make EBP the standard and norm for nursing practice.

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