Evidence-Based Practice in Oncology Nursing

Oncology Nursing Society survey results

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BACKGROUND: Evidence-based practice (EBP) is a clinical decision-making approach that improves quality and outcomes in health care but is not yet standard in clinical settings.

OBJECTIVES: The purpose of this study was to determine EBP beliefs, knowledge, implementation strategy self-efficacy, and competencies among a national sample of oncology nurses.

METHODS: Oncology nurses completed an online survey of EBP attributes and open-ended questions. Analyses were conducted on data collected from 893 participants from a range of healthcare organizations across a diverse geographic sample of the United States.

FINDINGS: Respondents rated themselves competent to question clinical practice to improve quality care. Oncology nurses reported competency to question clinical practice but deficits in EBP knowledge and skills.

KEYWORDS
evidence-based practice; implementation strategies; oncology nursing

A LITTLE MORE THAN A DECADE AGO, the Institute of Medicine established a goal that, by 2020, 90% of all clinical decisions would be based on accurate, timely, and up-to-date information reflecting the latest evidence (Olsen et al., 2009). Despite the abundance of evidence that is published in nursing and health care, synthesizing and implementing evidence-based practice (EBP) remains a challenge. EBP is an approach to clinical decision-making that integrates the best evidence from well-designed studies with a clinician's expertise. EBP also includes internal evidence from patient assessments, practice data, and a patient's preferences and values (Melnyk & Fineout-Overholt, 2019; Sackett et al., 1996). Findings from research support that implementation of EBP improves quality of care, decreases healthcare costs, improves patient outcomes (McGinty & Anderson, 2008; Melnyk, 2007; Singleton, 2017; Williams, 2004), and supports organizations in attaining high reliability (Melnyk, 2012). In spite of the substantial body of evidence showing that EBP improves healthcare quality and patient outcomes (including reduced morbidity, mortality, medical errors, costs, and geographic variation of healthcare services), evidence indicates that it is not standard practice among a majority of healthcare professionals across the United States (Aasekjaer et al., 2016; McGinty & Anderson, 2008; Melnyk & Fineout-Overholt, 2019; Williams, 2004). However, the generalizability of this finding to oncology nurses is not yet clear.

EBP was not included in most academic nursing programs prior to 2009; therefore, many currently practicing nurses never learned EBP. The lack of EBP knowledge, skills, self-efficacy (confidence in one's ability to implement EBP and achieve desired outcomes), and competency is a persistent barrier to fully implementing EBP into nursing practice. In addition, other major barriers limiting the implementation of EBP have been defined as lack of resources to support EBP (including time and EBP mentors), the perception that EBP is time-intensive, a belief that organizational culture does not support EBP (Majid et al., 2011; McClellan et al., 2008; Melnyk et al., 2004;

Pittman et al., 2019), and a lack of confidence and knowledge in implementation strategies. Studies also have reflected challenges related to managers and leaders supporting EBP that include manager and leader resistance to EBP (Melnyk et al., 2012, 2016), as well as lack of knowledge and skills related to leading EBP (Pittman et al., 2019; Stetler et al., 2014; Välimäki et al., 2018). To support EBP, clinical nurses and leaders in healthcare organizations and professional organizations can build and sustain EBP cultures and infrastructures (Gallagher-Ford et al., 2020). This support allows nurses in oncology care to implement new science and discoveries, leading to EBP patient care strategies that can improve the care, healing, and quality of life of cancer survivors.

Professional nursing organizations have an important role to play in promoting evidence-based practice and are in a unique position to respond to the gap between emerging evidence and quality care (Mallory, 2010). Professional organizations promote EBP in a variety of ways. As an example, the Oncology Nursing Society (ONS) supports generating new knowledge through research, as well as mentoring research scientists in their specialties (Rosenzweig et al., 2019). ONS also develops evidence-based resources for members and others that can be used at the point of care (Gobel et al., 2006; Johnson, 2014). ONS has led EBP initiatives, starting in 2001 when it developed an EBP resource area on its website. These web resources have supported critical appraisal and application of evidence to address patient symptoms and

"A strong correlation was found between EBP implementation self-efficacy and EBP competency."

side effects of cancer treatment (Mallory, 2010). Over time, these resources transitioned to the ONS Putting Evidence Into Practice (PEP) resources that evaluated and leveled current evidence on 20 relevant cancer symptoms, side effects, and caregiver strain and burden (Johnson, 2014). The PEP resources have been available for more than 15 years, yet the current EBP knowledge, beliefs, self-efficacy, and practice of oncology nurses remain unknown. Therefore, ONS collaborated with the Helene Fuld Health Trust National EBP Institute for Nursing and Healthcare (the Fuld Institute) to gain an understanding of the current state of EBP in oncology nursing practice, as reported by ONS members, and identify oncology nurses' strengths, gaps, and experiences with

TABLE 1.

COMPARISON AMONG EBP SCALES

INSTRUMENT/SURVEY	DESCRIPTION	PSYCHOMETRIC TESTING
EBP Beliefs Scale	This is a 16-item Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Sample items include "I am clear about the steps in EBP" and "I am sure that I can implement EBP." Higher summed scores indicate stronger EBP beliefs.	The scale has established face, content, and construct validity with internal consistency reliability above 0.85 (Melnyk et al., 2008).
EBP Competency Scale	The EBP competencies are measured using an EBP competency self-assessment scale. The EBP competencies include 13 essential competencies for practicing RNs and an additional 11 competencies for advanced practice nurses.	The scale has established face, content, and construct validity with internal consistency reliability of 0.98 (Melnyk et al., 2018).
EBP Knowledge Assessment Questionnaire	The EBP Knowledge Assessment Questionnaire includes 25 multiple-choice and 13 true or false questions. Five of the test items used to develop the EBP Knowledge Assessment Questionnaire were selected from the test item pool developed by Spurlock and Wonder (2015). Questionnaire items were written according to best practice guidelines, judged by a national panel of EBP content experts.	The questionnaire has established face, content, and construct validity with internal consistency reliability of 0.87 (Melnyk et al., 2018).
Implementation Self-Efficacy for EBP Scale	The Implementation Self-Efficacy for EBP Scale is a 29-item scale assessing level of self-efficacy (confidence) related to implementation strategies on a scale of 0% to 100% for all 29 items.	The scale has established face and content validity with internal consistency reliability of 0.987 (Tucker et al., 2020).

EBP—evidence-based practice
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EBP regarding oncology nursing practice. In addition, this study uniquely included an assessment of ONS members' self-efficacy related to EBP implementation strategies using a new instrument.

Methods

A nonexperimental, descriptive, correlational study was conducted using a web-based Qualtrics survey. The survey included questions related to demographics and EBP attributes, including beliefs, implementation self-efficacy, competence, and knowledge. The study was submitted to the Ohio State University Institutional Review Board and was deemed exempt.

The research questions investigated in this study include the following:

- What is the current state of ONS members' EBP beliefs, EBP implementation self-efficacy, EBP competencies, EBP knowledge, and activities that support EBP?
- What are the relationships among ONS members' EBP beliefs, EBP implementation self-efficacy, EBP competencies, EBP knowledge, activities that support EBP, and participant organizational characteristics?
- Are the differences in EBP beliefs, EBP implementation self-efficacy, EBP competencies, EBP knowledge, and activities that support EBP among subgroups categorized by select ONS members' and/or organizational characteristics?

Procedures

An email was sent in April 2019 to the ONS members who are on the ONS mailing list with an invitation to complete an anonymous survey. Reminder emails were sent a week following the first contact and two days before the survey closed. In addition to the email, announcements were made about the study on the ONS group social media pages. In addition, participants who attended the 2019 ONS Congress™ received invitation flyers at the conference regarding the survey, with a link inviting them to participate in the survey.

The survey participants were offered an incentive to participate in the research study: an opportunity to enter a drawing for 1 of 20 $25 gift cards. The gift card recipients were determined using a computer-generated random number list. The recipients received their gift card within four weeks of the closing of the survey.

A total of about 20,000 ONS members were surveyed, which is about half of the total ONS membership. The study was targeted to nurses working in clinical settings (about 15,000) and nurses in leadership roles (about 5,000) because each of these member groups are in positions in which they would either be leading or participating in EBP projects.

Measures

The data collected included demographic questions, questions related to use of EBP applications and guidelines, and professional practice questions (e.g., Magnet® status, certification,

education). Valid and reliable instruments about EBP beliefs, EBP implementation self-efficacy, EBP competencies, and EBP knowledge were included. The survey consisted of 130 questions and took about 30 minutes to complete. Descriptions of the validated instruments are included in Table 1.

TABLE 2.

SAMPLE CHARACTERISTICS

CHARACTERISTIC	n	%
Gender (N = 574)		
Female	554	97
Male	20	3
Highest level of education in nursing (N = 571)		
BSN	317	55
MSN	133	23
Associate degree in nursing	70	12
Diploma	18	3
Doctor of nursing practice	12	2
PhD	5	1
Other	16	3
Role (N = 573)		
Direct patient care	324	57
Nursing leadership	73	13
Staff or patient education	63	11
Patient navigator	40	7
Clinical nurse specialist	20	3
Other	53	9
Work setting (N = 572)		
Inpatient	272	48
Ambulatory clinic	191	33
Community-based oncology practice	66	11
Other	43	7
Working in a Magnet®-designated organization (N = 571)		
Yes	287	50
No	284	50

Note. Numbers may not equal the total sample because of missing data.
Note. Because of rounding, percentages may not total 100.

Statistical Analysis

Descriptive statistics were used to describe demographic and organizational characteristics of the ONS members and to summarize the overall and item score of EBP competency and EBP implementation self-efficacy. Continuous variables were reported as mean and standard deviation (SD), and categorical variables were reported as frequencies and percentages. Participants' mean response on EBP beliefs, competency, and knowledge were compared with national data using independent samples t test. In addition, associations among EBP attributes were examined using Pearson correlations. Finally, a multiple linear regression model was built to identify the predictors of EBP competency. All analyses were conducted using SAS, version 9.4.

Results

The survey was sent to 20,504 ONS members by email, opened by 4,043 (20%), and completed by 893 (22% of opened emails). The mean age of the nurses was 46.7 years (SD = 11.9), and they resided in 49 states. The majority of the nurses were female (97%) and non–Hispanic or Latino (96%). About 27% of the nurses had a master's degree or higher, 57% worked in direct patient care, 48% worked in inpatient care, and 50% worked in a Magnet-designated organization (see Table 2). Most respondents were certified in oncology nursing (76%) or another specialty (26%).

Figure 1 shows the average score of the EBP competency by items. All items except item 1 were scored between 2 (needs improvement) and 3 (competent). On average, respondents were most competent in questioning clinical practices for the

FIGURE 1.
AVERAGE SCORE OF EBP COMPETENCY SCALE ITEMS (N = 758)
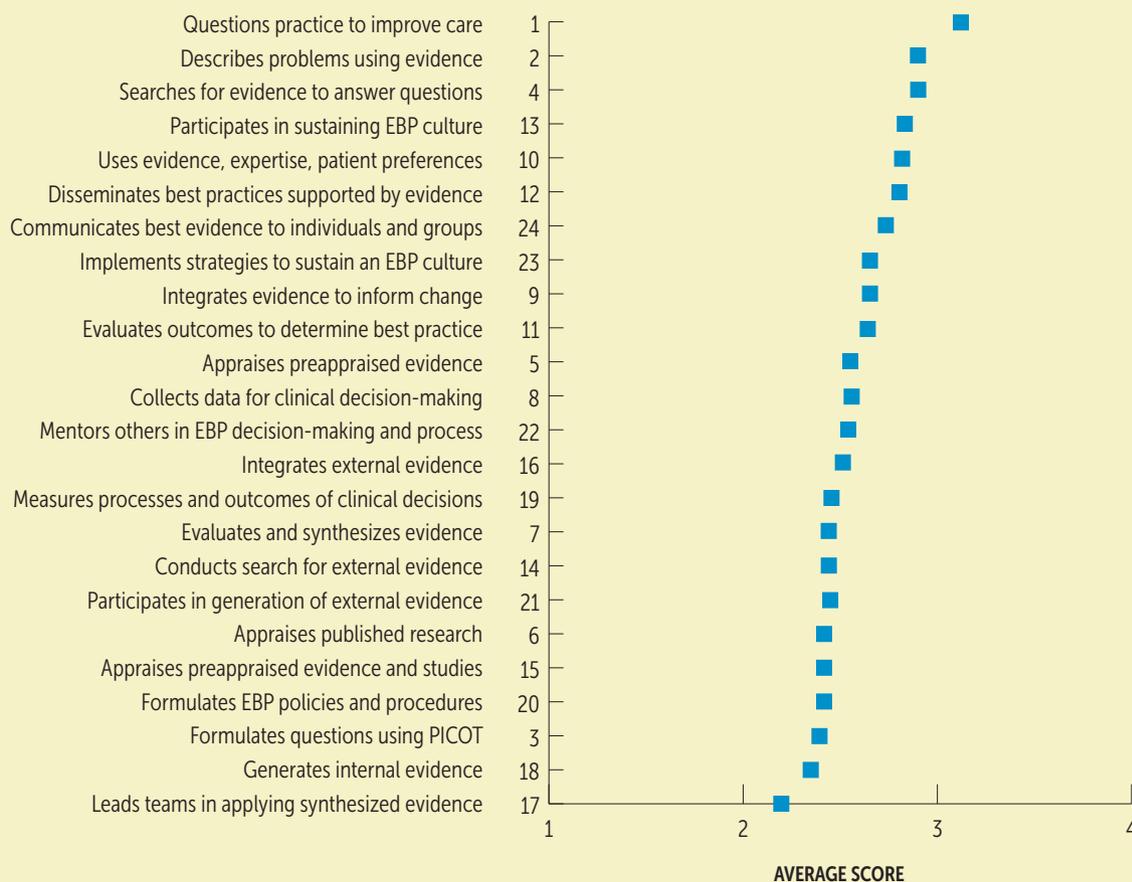
EBP—evidence-based practice; PICOT—Patient, Intervention, Comparison, Outcome, Time
Note. Scores range from 1 (not competent) to 4 (highly competent).
Note. EBP Competency Scale items from "The Establishment of Evidence-Based Practice Competencies for Practicing Registered Nurses and Advanced Practice Nurses in Real-World Clinical Settings: Proficiencies to Improve Healthcare Quality, Reliability, Patient Outcomes, and Costs," by B.M. Melnyk et al., 2014, *Worldviews on Evidence-Based Nursing, 11*(1), p. 11. Copyright 2014 by Melnyk et al. Reprinted with permission.

TABLE 3.

EBP BELIEFS, COMPETENCY, AND KNOWLEDGE OF SURVEY RESPONDENTS

SCALE	RANGE	ONCOLOGY NURSING SOCIETY			NATIONAL DATA			X̄ DIFFERENCE	p	COHEN'S d
		N	X̄ SCORE	SD	N	X̄ SCORE	SD			
EBP Beliefs Scale	16–80	893	62.4	8.7	2,344	56.7	8.5	5.7	< 0.0001	0.66
EBP Competency Scale	24–96	758	60.1	16.3	2,344	53.5	16.1	6.6	< 0.0001	0.41
EBP Knowledge Assessment Questionnaire	0–38	467	19.8	6.9	2,344	19.5	6.9	0.3	0.34	0.04

EBP—evidence-based practice
Note. Higher scores on the EBP Beliefs Scale indicate stronger beliefs in EBP, higher scores on the EBP Competency Scale indicate greater competency in EBP, and higher scores on the EBP Knowledge Assessment Questionnaire indicate greater knowledge about EBP.
Note. The national data are based on Melnyk et al., 2018.

purpose of improving the quality of care (item 1: $\overline{X}$ = 3.11, SD = 0.62) and were least competent in leading transdisciplinary teams in applying synthesized evidence to initiate clinical decisions and practice changes to improve the health of individuals, groups, and populations (item 17: $\overline{X}$ = 2.19, SD = 0.86). Results from the Implementation Self-Efficacy for EBP Scale found that of all the 29 items, 3 items had an average score slightly higher than 70% and 4 items had an average score below 60%. Specifically, respondents were most confident in reporting results to senior leaders ($\overline{X}$ = 70.8%, SD = 25.4) and were least confident in mobilizing needed electronic health record (EHR) changes to facilitate implementation of EBP (item 10: $\overline{X}$ = 50.3%, SD = 26.6). In addition, respondents were less confident in obtaining needed human resources (item 8: $\overline{X}$ = 54.3%, SD = 25.5), equipment, and supplies (item 9: $\overline{X}$ = 54%, SD = 25.1) for implementation of EBP.

As shown in Table 3, the average EBP beliefs total score was 62.4 (SD = 8.7) and the average EBP competency score was 60.1 (SD = 16.3). EBP beliefs and EBP competencies were higher than the national average scores (Melnyk et al., 2018) (beliefs: p < 0.0001, effect size = 0.66; competencies: p < 0.0001, effect size = 0.41). Mean response on the EBP knowledge questions was 19.8 (SD = 6.9), which was not different from the national average (p = 0.34, effect size = 0.04). However, a mean score of 19.8 (52%) out of a total score of 38 is usually considered an F grade in academic courses, indicating a poor level of EBP knowledge. Beliefs that respondents rated highest included the following:

- "EBP results in the best care for patients."
- "Evidence-based guidelines can improve care."
- "Implementing EBP will improve the care I deliver."

For competencies, respondents noted gaps where they reported needs improvement with "formulating PICO questions," "leading transdisciplinary teams," and "generating internal evidence."

Respondents' mean self-efficacy was 64.7% (SD = 21), which was slightly above the mean of 63.57% reported in a published study with staff nurses (n = 55) and leaders (n = 10) from an inpatient hospital in an academic medical center (Tucker et al., 2020). EBP competency was strongly associated with EBP implementation self-efficacy (r = 0.67), and moderately associated with EBP beliefs (r = 0.52) and EBP knowledge (r = 0.4).

Finally, a multiple linear regression model was built to examine the predictors of EBP competency (see Table 4). The predictors included demographic characteristics and EBP attributes (EBP beliefs, implementation self-efficacy, and knowledge). After adjusting for all remaining variables in the model, having a master's or doctoral degree, having higher EBP beliefs, and having higher EBP implementation self-efficacy were associated with higher EBP competency. Working in direct patient care was associated with lower EBP competency. EBP knowledge was not associated with EBP competency after adjusting for other variables in the model.

In addition to the validated questionnaires, open-ended questions about EBP at the respondents' clinical sites were included, and 43% reported having stopped a practice because it was not evidence-based and 41% reported currently reviewing practices to see if they are evidence-based. Organizational characteristics included work setting, with 26% working in acute care in a community or regional site and 33% working in a hospital-based ambulatory clinic. Most worked in hospitals with 500 beds or less (66%) and were Magnet-designated (50%) or in a Pathway to Excellence Program®–designated organization (33%).

When ONS members were compared to a large sample of nurses surveyed in a national EBP competencies study (N = 2,344) (Melnyk et al., 2017), they reported significantly higher EBP beliefs and self-reported EBP competency. Higher education was associated with higher EBP competency in the current study but not in the national study. In both studies, working in a Magnet-designated organization was not associated with EBP competency, and on the objective EBP knowledge scale, the national and oncology respondents performed similarly.

Consistent with other research, the current results did not find a correlation between EBP implementation or competencies with age, years in practice, or certification (Melnyk et al., 2018).

Discussion

This survey provides important insight regarding the current state of EBP among a sample of oncology nurses. A strong correlation was found between EBP implementation self-efficacy and EBP competency. This particular finding is new given the use of a new measure (implementation self-efficacy for EBP), which measured nurses' confidence in their ability to use implementation strategies and achieve desired outcomes. As individuals' self-efficacy increased, so did their EBP competency. This finding is consistent with other studies that have demonstrated that using a variety of implementation strategies leads to added EBP implementation success (Kirchner et al., 2020).

TABLE 4.

PREDICTORS OF EBP COMPETENCY
FROM A MULTIPLE LINEAR REGRESSION MODEL

PARAMETER	COEFFICIENT ESTIMATE	STANDARD ERROR	p
Education			
MSN or higher	3.26	1.36	0.02
BSN or lower	Reference	–	–
Role			
Direct patient care	−2.57	1.17	0.03
Others	Reference	–	–
Magnet®-designated organization			
Yes	−1.18	1.06	0.27
No	Reference	–	–
Work setting			
Inpatient	1.5	1.13	0.19
Community	0.43	1.72	0.8
Ambulatory	Reference	–	–
EBP Beliefs Scale	0.67	0.08	< 0.0001
Implementation Self-Efficacy for EBP Scale	0.28	0.03	< 0.0001
EBP Knowledge Assessment Questionnaire	0.17	0.09	0.06

EBP—evidence-based practice
Note. R^2 = 0.59

ONS members reported a slightly higher overall average score on the 29-item Implementation Self-Efficacy for EBP Scale than a previous hospital-based sample of nurses (Tucker et al., 2020). Self-efficacy (i.e., confidence) in implementation strategies is essential because the implementation phase of EBP is often the most complex and challenging step in EBP (Tucker & Gallagher-Ford, 2019) because it requires change. Many researchers have studied factors that promote the uptake of evidence into practice and a number of strategies, including assessing and targeting local setting barriers and facilitators, have been demonstrated as important to the implementation phase of EBP (Geerligs et al., 2018). This includes oncology practices in which transdisciplinary teams provide care and some longstanding practices may be resistant to change (Gesme & Wiseman, 2010; Tartaglione et al., 2018). On the other hand, oncology care is quite familiar with the clinical trials process that studies different treatment options, searching for the best clinical outcomes. Understanding what implementation strategies can promote evidence-based cancer care is important.

Strengths and Limitations

The study had several strengths and limitations. To the authors' knowledge, this is the first national survey of EBP beliefs and competencies among a specific group of oncology nurses, and the measure of implementation self-efficacy for EBP is novel. The sample was large and geographically diverse, with respondents from 49 of 50 states. The scales and tools used in the study have demonstrated strong psychometric properties.

The survey was marketed to ONS members who may have responded differently to EBP questions because they are members of a professional organization. The study used emailed surveys, which render a relatively low response rate (30%) (Lindemann, 2019). The survey did not meet the general expectation for representation, with a 19.8% response rate. All of the data were self-reported, other than the EBP Knowledge Assessment Questionnaire, and research reflects that response bias is a possibility in self-reported data (Rosenman et al., 2011). The study used a cross-sectional design with a one-time assessment of EBP attributes and variables presented in the article. Therefore, the interpretation of inferential analyses including multiple linear regressions is limited to correlational relationships between predictors and outcomes without causal inferences.

Implications for Nursing

Improving the uptake of EBP into clinical settings involves a multipronged approach with effort from individual clinicians, healthcare organizations, and professional organizations. At the individual level, oncology nurses scored significantly higher on EBP beliefs and self-reported EBP competency than nurses in a national EBP study and reported that they strongly agree that EBP results in the best care for patients and improves cancer care delivery (Melnyk et al., 2017). This finding is positive and

can be further advanced through training, leadership support, and communication. Where beliefs and confidence decreased was in the teachable skills of EBP, such as finding the evidence, measuring outcomes, and being able to implement practice changes. Oncology nurses reported being knowledgeable about the steps of EBP even though when that knowledge was tested, scores showed room for improvement. Having a master's degree or higher improved competency and knowledge levels; however, attaining a master's degree is not feasible for everyone and it is not the only way to increase EBP competence. Gallagher-Ford et al. (2020) demonstrated that a single intensive (five-day) EBP education and skill-building program significantly increased all EBP attributes, regardless of academic preparation, and the gains were sustained over an expended time frame.

Barriers at the level of healthcare organizations that need to be mitigated prior to successful implementation of EBP include the need for resources, such as equipment and supplies for adoption, and the ability to mobilize EHR changes, which are under the umbrella of institutional influence. These barriers that fall under institutional influence would need to be addressed by leadership, which can occur through engaging senior leaders in EBP training. Two of the authors of this article have a study in progress that involves a randomized controlled trial of engaging senior leaders in a cancer center in an intensive EBP training program. Preliminary findings indicate significant increases in participant knowledge, beliefs, implementation self-efficacy, and competencies over a three-month period and as compared to the wait-list control group.

At the national and local levels, professional organizations can assess and learn from their members to plan future educational programs that support EBP. In the current study, ONS used valid and reliable EBP tools that generated specialty-specific data that can be used to plan an action agenda in response. This accurate representation of the current state of EBP among oncology nurses supports several action items that can be enacted by ONS, including creating opportunities to raise awareness related to EBP within this specialty, as well as development and implementation of an education plan to increase EBP competency among the oncology nursing workforce.

Oncology nurses in any role or at any education level can play an active part in implementing the steps of EBP. Based on the tremendous benefits of EBP, including higher quality of care, improved patient outcomes, and decreased healthcare costs, integrating EBP into the oncology nursing culture is an important goal (McGinty & Anderson, 2008; Melnyk, 2007; Singleton, 2017; Williams, 2004). For nurses to convert their practice questions into evidence-based solutions that are translated into a plan that changes care, education on the EBP process along with institutional support is needed. This institutional support includes leadership that is actively engaged in supporting evidence-based practice by providing resources, equipment, and interdepartmental collaboration including quality and informatics. Providing

IMPLICATIONS FOR PRACTICE
- Increase acceptance of evidence-based practice in clinical settings from individual clinicians, healthcare organizations, and professional organizations.
- Improve understanding of oncology nurses' gaps in knowledge and skills to provide education at the national and local levels.
- Provide guidance on implementation barriers and start the conversation on implementation solutions.

oncology nurses with opportunities to practice the EBP process will build skills to lead sustained practice change. Working collectively to increase knowledge and competency in EBP among oncology nurses through education—in colleges and universities, as well as in the workplace and professional organizations—is important. This collective action will support nurses at the individual level, within healthcare settings, and within professional organizations. Creating environments in which EBP is the foundation for patient care and where all oncology nurses are engaged will meet the goals the Institute of Medicine set more than a decade ago and lead to improved patient outcomes.

Conclusion

This was the first national survey of EBP beliefs, knowledge, competency, and implementation self-efficacy among oncology nurses. Oncology nurses reported competency to question clinical practice, but deficits in EBP knowledge and skills exist within the profession. This research guides a data-driven platform prompting an urgent call to improve EBP knowledge and practices. Development of action plans to drive high-quality, safe, and cost-effective care is warranted to improve patient outcomes.

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