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An Exploration of The Factors That Impact on Clinical Practices of Nurses in Applying Evidence-Based Practice

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ABSTRACT While healthcare institutions around the world strive to adopt evidence-based practice (EBP) as the new standard in best practice, the nursing profession still faces multiple barriers and limitations in implementation. This paper aims to present the analysis of EBP from the perspective of nurses working within two major South Australian hospitals, assessing their implementation and beliefs and exploring avenues for further research-based upon their feedback. A descriptive study using the EBP beliefs (EBP-b) and the EBP implementation (EBP-I) scales were developed by Melnyk and Fineout-Overholt. A total of 27 participants completed the survey. Participants were predominantly female (92%) and half of them were level I registered nurses. Educational achievements ranged from diploma to master's degree and 39% had over 20 years of working experience. Interestingly, 74% reported being exposed to EBP during their nursing education, whereas 30% had taken a continuing education course in EBP and 15% reported a lack of knowledge about EBP. Nurses scored high in the EBP belief scale reflecting significant positive readiness towards EBP. Most of the participants (93%) of participants agreed that EBP results in the best clinical care for patients (M=4.48, SD=0.75) and 93% believed that EBP improved care delivery (M=4.41, SD=0.75). Similarly, a positive correlation was observed between EBP beliefs and implementation, yet implementation rates were very low. More research is needed to explore the reasons why implementation rates are so low amongst practicing nurses to understand and address the root of this problem. Based on the evidence it appears that more research is needed to explore the reasons why implementation rates are so low amongst practicing nurses to understand and address the root of this problem.

INDEX TERMS Clinical decision making, Evidence-based practice, EBP, Evidence-based nursing, Evidence-based decisions, knowledge translation, research literacy.

I. INTRODUCTION

Evidence-based Practice (EBP) is a life-long problem-solving approach paradigm informed by scientific research methodologies since the 1990s [1]. In 2003, this process culminated in the Sicily statement, which proposed a step-by-step model for EBP education consisting of the following: a) Step 1: Ask (formulating a research question); b) Step 2: Access (designing and conducting a search strategy for answers); c) Step 3: Appraise (critical appraisal

of found evidence); d) Step 4: Apply (applying the findings in a clinical setting); and e) Step 5: Assess (evaluating practice) [2]. Despite extensive validation that EBP leads to consistently better-quality care, improved patient and population health at reduced costs to the healthcare system, it is still not widely implemented in routine clinical practice. A review of the literature suggests that although EBP is in-built into nursing education and practice regulations, actual use in clinical practice is disturbingly low [3, 4] Melnyk et

al. acknowledge EBP improves healthcare quality and patients' outcomes but is not standard practice [5]. Multiple barriers and challenges confront healthcare professionals in actual implementation at the point of care [6-8]. Briefly, common barriers to EBP adoption include limitations of time, necessary research literacy skills to implement EBP, the enormity of healthcare literature, a lack of organizational and collegial support for EBP, lack of resources, the power to change practice and competing for organizational priorities [5, 6, 8, 9].

The nurse's level of training or years of experience has been highlighted as a further challenge to the beliefs and capacity to implement EBP in daily clinical practice [10, 11]. The degree of understanding EBP protocols and best practice guidelines by nurses has been suggested to influence lower adherence and consistent implementation [12]. Arguably, this may be due to the limited focus placed on EBP in accreditation criteria for the nursing profession [13]. What is apparent is that EBP integration, although developing rapidly, may not be growing fast enough to parallel the growth of the medical research field [14].

Studies from around the world demonstrate shared commonalities in the experience of barriers and enablers to EBP. However, there is need to understand the constraints of evidence to practice by South Australian nurses as it has not been studied before. This paper aims to present the analysis of EBP from the perspective of nurses working within two major South Australian hospitals, assessing their implementation and beliefs and exploring avenues for further research-based upon their feedback. The findings of the study will be of value to policymakers and healthcare institutions in developing and improving upon frameworks of EBP implementation in clinical practice. It will form the starting point for future adaptation by South Australian healthcare organizations to develop multi-faceted EBP readiness programs and lead the way for EBP to continue its assimilation into the Australian healthcare structure.

A. THEORETICAL FRAMEWORK

The theoretical framework for the study was based upon the Advancing Research and Clinical Practice through Close Collaboration (ARCC) model [15]. Unlike other EBP models [16-19] ARCC is a system-wide model to advance and sustain EBP in healthcare systems [20]. The model involves; (1) assessment of the organisational readiness for implementation; (2) identifying barriers and facilitators of the EBP process, (3) development of EBP mentors, (4) implementation of evidence and (5) evaluating the outcomes. The ARCC model further proposes that improvement in EBP would lead to better patient outcomes and job satisfaction [20].

The main premise of this study is that improving clinicians' beliefs towards EBP improves EBP implementation and it provides a framework for developing EBP mentors and Champions to identify and address low EBP implementation.

B. STUDY OBJECTIVES

To determine the extent of EBP adoption and examine the EBP beliefs and implementation among South Australian nurses working in two major hospitals in Australia.

II. METHOD

A. STUDY DESIGN AND SETTING

A non-experimental survey design was used to assess nurses' perceptions of the factors that impact on clinical practices of nurses in applying evidence-based practice. An online descriptive survey was conducted from June to August 2018 with a convenience sample of nurses working in two large metropolitan South Australian hospitals. The principal researcher emailed invitations to administrative staff, who then forwarded the invitation to the nursing and administrative staff of the two target hospitals. Email reminders were sent at 2, 4 and 6 weeks. A total of 27 participants completed the survey. Ethical approval was sought and obtained from The Social and Behavioral Research Ethics Committee (SBREC) at the University and the Local Health Network for the hospitals. Completion of the survey indicated consent to participate in the study.

B. DATA COLLECTION

Email invitations to the executive assistant of the Executive Director of Nursing and Midwifery of the Local Health Network, who then forwarded the invitation to nurses working in the selected hospitals. The email included details of the study's purpose, potential risks and benefits and a web link to the online survey. The online survey, created with SurveyMonkey's online software, stayed open for 12 weeks to ensure that participants had enough time to consider their participation without pressure. We took into account time considerations for busy nurses and therefore the maximum time is taken to complete the survey was kept within 10 minutes.

C. STUDY INSTRUMENT

The online survey, comprised of self-reported instruments measuring demographic data, EBP beliefs and EBP implementation scales developed by Melnyk and Fineout-Overholt, a valid, recognised and reliable measure of EBP in clinical practice [5]. The EBP Beliefs Scale is a 16 item Likert-style scale that rates the value of EBP from the perspective of nurses. The EBP Implementation scale assessed the extent to which nurses utilised EBP in day-to-day practice by collecting data on how frequently EBP was utilised in their daily practice over 8 weeks.

D. OUTCOME MEASURES

1.) SOCIODEMOGRAPHIC AND PROFESSIONAL DATA

The survey collected demographic data relating to participants' age, sex, level of education, role in the organization, number of years of professional nursing

experience as well as in their current role, level of employment (full/part-time or casual) along with where they had been exposed to the concept of EBP.

2.) EBP BELIEFS (EBP- B) SCALE

The EBP Beliefs Scale (EBP-B) measures a person’s beliefs about the value of EBP and their ability to implement it. Melnyk et al. designed the scale, to advance the understanding of beliefs about EBP and their relationship to EBP implementation [21]. In the development of the tool, beliefs about EBP were defined by Melnyk et al [21] as “endorsement of the premise that EBP improves clinical outcomes and confidence in one’s EBP knowledge/skills”. The instrument was designed to measure this belief construct on a 5-point Likert scale (Strongly Disagree to Strongly Agree). Scoring on the tool includes reverse scoring of two negatively phrased items (#11 and # 13) and then summing the responses to obtain a total score that ranges between 16 and 80. The original EBP-B scale’s internal consistency was measured at = .90 [21]. TABLE 1 further describes the relationship between the level of agreement with each item, the Likert scale and the respondent’s score.

TABLE 1
Score Ranges for EBP-B Scale

Likert-Scale	Level of Agreement	Score Range
1	Strongly disagree	16-31
2	Disagree	32-47
3	Neither agree nor disagree	48-63
4	Agree	64-79
5	Strongly agree	80

TABLE 2
Score Ranges for EBP-I Scale

Likert-Scale	No. of times EBP was used in the last 8 weeks	Score Range
0	0	0-17
1	1-3	18-35
2	4-5	36-53
3	6-7	54-71
4	8	72

3.) EBP IMPLEMENTATION (EBP- I) SCALE

The EBP Implementation Scale (EBP-I) was developed from a review of literature on the essential components and steps of EBP [21]. The scale on a 5-point frequency scale is intended to measure how often in the past 8 weeks the participant accomplished an item considered an essential component of EBP. Scoring consisted of summing responses to the 18 items for a total score that could range from 0 to 72.

The internal consistency of the original EBP-I scale was measured at = .96 [21]. Table 1 further describes the association among the number of times EBP was used in the last 8 weeks, Likert scale and composite respondent score (see TABLE 2).

TABLE 3
Sociodemographic and Professional Data

Demographic data	Frequency	Percent
<u>Gender</u>		
Male	2	8%
Female	23	92%
<u>Age</u>		
25 years and under	3	11.1%
26-39 years	9	33.3%
40-49 years	7	25.9%
50 years +	8	29.6%
<u>Highest level of education</u>		
Diploma or Advanced Diploma	6	22.2%
Diploma	15	55.6%
Bachelor’s degree	4	14.8%
Master’s Degree	0	0%
Doctoral Degree	2	7.4%
Other		
<u>Years of Experience</u>		
Less than 5 years	4	17.4%
5-10 years	3	13%
10+ years	7	30.4%
20+ years	9	39.1%
<u>Employment</u>		
Full time	10	37.0%
Part time	16	59.3%
Casual	1	3.7%
<u>Role</u>		
RN level 1	13	50%
RN level 2	7	26.9%
RN level 3	4	15.4%
RN level 4	2	7.7%
RN level 5	0	0%
<u>Exposure to EBP</u>		
Nursing education	16	59%
Continuing education	4	14.8%
Do not know much about EBP	4	14.8%

III. RESULTS

Quantitative data collected from the survey were analysed using IBM’s SPSS (Statistical Package for the Social Sciences) Statistics software, Version 21.0. The

researchers employed descriptive statistics for describing the salient features of variables and bivariate analyses for identifying the relationships between the variables.

A. DEMOGRAPHICS

A total of 27 participants completed the online survey. Ninety two percent (n=25) of respondents were female; 7% (n=2) were male. The age of the respondents ranged from 25 years and under (11.1%), 26-39 years (33.3%) with 40 plus (55.5%). Fifteen percent (n=4) of the respondents held master's degrees or higher, with most participants (55.6%) holding a bachelor's degree. 39.1% had over 20 years of nursing experience. The mean number of years of experience

in nursing was 14.9 (SD:10.9). The majority of the sample was composed of level 1 Registered Nurses (RNs) (n=13, 50%) followed by RN Level 2; Clinical Nurses (n=7,27%). In response to a question about exposure to EBP, 59% reported being exposed to EBP during their nursing education while 14.8% had taken a continuing education course in EBP and 14.8% reported not knowing much about EBP at all. TABLE 3 reports the demographic data for respondents.

B. BELIEFS TOWARDS EVIDENCE-BASED PRACTICE

From the EBP Belief Scale, the average total score was 62.0 (possible score 16-80), and the standard deviation (SD)

TABLE 4
Descriptive Statistics for EBP Beliefs Scale

EBP Beliefs Scale	Disagree and strongly disagreed (%)	Neither agree nor disagree (%)	Agree and Strongly Agree (%)	Mean (SD)
1. I believe that EBP results in the best clinical care for patients	3.7	3.7	92.6	4.48 (0.8)
2. I am clear about the steps of EBP	14.8	14.8	70.9	3.81 (1.0)
3. I am sure that I can implement EBP	3.7	14.8	81.4	4.11 (0.8)
4. I believe that critically appraising evidence is an important step in the EBP process	0	14.8	81.4	4.3 (0.7)
5. I am sure that evidence-based guidelines can improve clinical care	3.7	3.7	92.5	4.33(0.7)
6. I believe that I can search for the best evidence to answer clinical questions in a time-efficient manner	29.6	3.7	66.6	3.48 (1.3)
7. I believe that I can overcome barriers in implementing EBP	18.5	25.9	55.5	3.4 (1.0)
8. I am sure that I can implement EBP in a time-efficient way	22.2	14.8	63.0	3.44(1.0)
9. I am sure that implementing EBP will improve the care that I deliver to my patients	3.7	3.7	92.6	4.41 (0.7)
10. I am sure about how to measure the outcomes of clinical care	14.8	22.2	62.9	3.63 (1.1)
11. I believe EBP takes too much time	44.4	44.4	11.1	2.44 (0.9)
12. I am sure that I can access the best resources in order to implement EBP	25.9	18.5	55.5	3.41 (1.1)
13. I believe EBP is difficult	59.4	37.0	3.7	2.15 (0.9)
14. I know how to implement EBP sufficiently enough to make practice changes	18.5	25.9	55.5	3.56 (1.1)
15. I am confident about my ability to implement EBP where I work	11.1	22.2	66.7	3.67 (0.9)
16. I believe the care I deliver is evidence-based	7.4	11.1	81.4	4.04 (0.9)

TABLE 5
Descriptive Statistics for EBP Beliefs Scale

EBP Beliefs Scale	Disagree and strongly disagreed (%)	Neither agree nor disagree (%)	Agree and Strongly Agree (%)	Mean (SD)
1. I believe that EBP results in the best clinical care for patients	3.7	3.7	92.6	4.48 (0.8)
2. I am clear about the steps of EBP	14.8	14.8	70.9	3.81 (1.0)
3. I am sure that I can implement EBP	3.7	14.8	81.4	4.11 (0.8)
4. I believe that critically appraising evidence is an important step in the EBP process	0	14.8	81.4	4.3 (0.7)
5. I am sure that evidence-based guidelines can improve clinical care	3.7	3.7	92.5	4.33(0.7)
6. I believe that I can search for the best evidence to answer clinical questions in a time-efficient manner	29.6	3.7	66.6	3.48 (1.3)
7. I believe that I can overcome barriers in implementing EBP	18.5	25.9	55.5	3.4 (1.0)
8. I am sure that I can implement EBP in a time-efficient way	22.2	14.8	63.0	3.44(1.0)
9. I am sure that implementing EBP will improve the care that I deliver to my patients	3.7	3.7	92.6	4.41 (0.7)
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13. I believe EBP is difficult	59.4	37.0	3.7	2.15 (0.9)
14. I know how to implement EBP sufficiently enough to make practice changes	18.5	25.9	55.5	3.56 (1.1)
15. I am confident about my ability to implement EBP where I work	11.1	22.2	66.7	3.67 (0.9)
16. I believe the care I deliver is evidence-based	7.4	11.1	81.4	4.04 (0.9)

was 10.91. In addition to this, Cronbach's Alpha was 0.94. From the results for this scale, 92.6% of participants agreed that EBP results in the best clinical care for patients ($M=4.48$, $SD=0.75$) and 92.6% agreed that EBP improved care delivery ($M=4.41$, $SD=0.75$). Only 11.1% believed that EBP is difficult ($M=2.15$, $SD=0.91$) and only 3.7% believed that it takes too much time ($M=2.44$, $SD=0.98$). **TABLE 4** demonstrates the nurses' EBP beliefs.

C. IMPLEMENTATION OF EVIDENCE-BASED PRACTICE

The overall mean for the EBP-I scale was 0.47. Although the highest score for this instrument related to "Used evidence to change my clinical practice" ($M=1.67$,

$SD=1.39$), only 25.9% stated that they had done this more than 5 times within the 8-week period that the survey was open, while 40.7% stated that they had done this less than 3 times. While 80.8% of participants had not generated PICO questions about their clinical practice ($M=0.27$, $SD=0.67$) and 96.2% had not accessed the National Guidelines Clearinghouse at all ($M=0.12$, $SD=0.59$).

D. RELATIONSHIP BETWEEN THE EBP BELIEFS AND IMPLEMENTATION SCALE SCORES

The results showed a positive correlation between EBP Beliefs and EBP Implementation. **TABLE 5** presents the results of a comparison between the two instruments aligned with demographic variables such as gender, level of

TABLE 6
Comparison of EBP-B and EBP-I scales against demographic variables.

		Mean_EBP_B	SD_EBP_B	Mean_EBP_I	SD_EBP_I
		Mean	Mean	Mean	Mean
Gender	Female	3.63	0.90	0.73	0.60
	Male	4.06	1.23	2.14	0.57
Highest level of education	Diploma or Advanced Diploma	3.82	1.06	1.52	0.51
	Bachelor's degree	3.55	0.92	0.50	0.58
	Master's Degree	4.17	1.07	1.10	0.88
	Doctoral Degree	.	.	.	.
	Others	3.06	0.81	0.31	0.43
Employment	Full Time	3.66	0.98	1.29	0.64
	Part time	3.68	0.92	0.53	0.60
	Casual	3.44	1.46	0.06	0.24
	other (Please specify)	.	.	.	.
Role	RN level 1	3.66	0.90	0.49	0.61
	RN level 2	3.14	1.02	0.91	0.39
	RN level 3	4.03	1.06	1.28	.95
	RN level 4	4.47	1.23	.33	.54
	RN level 5	.	.	.	.

education, employment status and exposure to EBP. Overall, male nurses scored highest on both questionnaires with a mean of 4.06 (SD=1.23) on the EBP-B scale and 2.14 on the EBP-I scale (SD=1.23). In terms of education levels, those with a master's degree scored the highest on the EBP-B scale (M=4.17, SD=1.07), however those with a Diploma or Advanced Diploma scored highest on the Implementation instrument (M=3.82, SD=0.51). Part-time employees scored highest on EBP-B scale (M=3.68, 0.92) while full time employees scored highest on the EBP-I scale (M=1.29, SD=0.64). Level 4 RNs scored highest on the Beliefs scale but lowest on Implementation. Level 2 RNs scored lowest on beliefs scale and Level 3 RNs had the highest Implementation mean.

As for exposure to EBP, 74% identified they learned about EBP in nursing school while 15% stated that they do not know much about evidence-based practice. had participated in continuing education EBP courses scored highest on both instruments.

IV. DISCUSSION

The results demonstrate that despite having a positive correlation between EBP beliefs and implementation scales, actual EBP implementation was extremely low. Studies utilizing the ARCC model indicate that there is a strong positive relationship between the beliefs held by practitioners and implementation in clinical practice [22]. Similar studies, using the same scales also found a positive correlation between beliefs and implementation, which

indicates that the stronger nurses' beliefs are about the benefits of EBP, the higher their implementation rate in clinical practice [23].

Time throughout the literature was identified as the most salient factor impacting negatively on nurses' ability to implement EBP in clinical practice. Khammarina et al reported that only 83.7% of nurses felt they lack time to read literature [24]. Previous studies [25, 26] revealed lack of time combined with heavy nursing workloads, would often result in routine clinical tasks taking higher priority over EBP-related activities.

Other well-documented barriers to evidence adoption of EBP included a lack of supportive organizational culture, accessibility of EBP resources and nurses' autonomy over practice change. More than half (55.5%) of participating nurses in this study believed they could make a practice change based upon EBP results along with 66.7% indicating their confidence to implement EBP where they work. It is interesting to note that 55.5% of the nurses in this study held a strong belief that they could access resources for EBP implementation yet, the lowest scoring item on the EBP-I scale measured how often they were accessing the National Guidelines Clearinghouse, an evidence-based database of clinical guidelines. 96.2% of the nurses in this survey had not accessed this resource at all in the 8-week period. The notion of research evidence supporting practice is also reflected in the second-lowest scoring item exploring how often nurses had generated a PICO question about their clinical practice, with 80.8% not at all in the survey period. Understanding

what evidence-based resources these nurses accessed to support their practice may be helpful in better understanding how to embed EBP into daily practice.

Educational background has been identified as an important barrier influencing nurses' ability and willingness to implement EBP [10]. Although nurses in this study with a master's degree scored the highest on the EBP-B scale, those with a Diploma or Advanced Diploma scored higher on the Implementation instrument, showing inconsistency with other similar studies.

The results demonstrate a clear need for further investigation into the reasons why EBP implementation rates are so low. Whilst this study is a starting point, it is important to develop a more comprehensive understanding of the factors impacting implementation at the clinical practice level. Establishing this will aid in the development of relevant and successful strategies to guide the implementation of EBP into practice. In addition, it would be important to explore nurses' EBP competency levels, in order to determine if implementation levels are being influenced by misconceptions of EBP. It has been suggested that this is a problematic influence, with many staff either over or underestimating the frequency of EBP usage [27]. Along with competency, exploring organizational influences will also provide valuable information for policymakers and healthcare administrators when implementing EBP changes. In exploring these areas further, the researchers expect to extend the survey for a second round, extending participation to all working RNs in South Australia. This will enable a wider data set to inform understanding.

One limitation of this study is its low response rate, which may not be a representative view of all nurses working in South Australia. Study attrition within the sample must be recognized as it is also not possible to know the characteristics of the respondents compared with those of non-respondents. Similarly, subjective self-reported measures alone, such as the EBP-B and EBP-I do not objectively reflect implementation or other aspects of EBP that contribute to the EBP implementation such as knowledge and skills. Therefore, caution should be used in generalising these findings to all nurses across South Australia.

SUMMARY BOX

What does this paper contribute to the wider global clinical community?

This paper aimed to investigate and explore the field of study into beliefs and implementation of evidence-based practices of South Australian nurses.

The outcome highlights a disparity between beliefs and implementation and informs the direction of future research.

This study provides a foundation for further investigations into potential models for healthcare organizations within South Australia to reinforce nurses' confidence and competency in implementing EBP, with the view to strengthen the standardization of care delivery and quality.

Impact Paragraph:

Despite the expansion and advancement of evidence-based medicine amongst clinical practitioners in Australia, this study found alarmingly low rates of EBP implementation by nurses in two metropolitan hospitals. Suggesting that although EBP beliefs are relatively strong, a great discrepancy exists in putting EBP beliefs and education into practice at the point of care. A wider study and the adoption of strategies to improve the implementation of EBP would be of great value to policymakers, administrators and clinicians alike.

V. CONCLUSION

In summary, this descriptive survey of nurses working in two metropolitan hospitals in South Australia suggests generally nurses held positive beliefs around the significance of EBP and their capacity to implement however, the actual implementation of EBP in clinical practice was alarmingly low. Discrepancies are evident between the findings of this and other studies on factors impacting EBP implementation, inferring that there is a great need for exploring this subject further to determine a better understanding of causes for low implementation rates. The researchers expect to extend the survey for a second round, with a larger sample size, by inviting participation from all working registered nurses in South Australia. This will enable the researcher to acquire a wider data set and more accurate results. Demographic data recorded from a wider cohort will be valuable to nursing research within South Australia.

Despite the limited sample size, a clear positive correlation between beliefs and implementation exists in this participant group. This, and other such studies measuring nurses' direct feedback on EBP Beliefs and Implementation are valuable for capacity building policy decisions, which can then influence implementation directly at the point of care and in doing so, can positively affect the optimization of care delivery to the patient and strengthening the standardization of care delivery and quality.

RELEVANCE TO CLINICAL PRACTICE

-) This study reports very low EBP implementation rates amongst nurses in two metropolitan South Australian hospitals, meaning that strengthening evidence adoption needs to be a clinical priority for nursing leadership.
-) Direct feedback from nurses can inform policymakers to develop successful strategies for improving EBP adoption, such as those involving the training of specialised EBP mentors.
-) Relevance to clinical practice: This study's results will be used to guide institutional strategy to strengthen nurses' beliefs about the clinical significance of evidence adoption in daily practice.

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