Evidence-based practice: What do undergraduate health students think it means?

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Abstract

Introduction: Evidence-based practice (EBP) is a client-centred, collaborative process of enquiry, evidence gathering and critical reasoning to facilitate defensible healthcare decisions. Developing EBP competence in health students starts with ensuring that they understand what EBP means. This study explored the meanings undergraduate health students ascribe to EBP and investigated whether their understandings differ based on year level or discipline.

Methods: An online survey of undergraduate students in 20 health degree courses included the open-ended question "What does EBP mean to you?" Druckman's (2005) method of content analysis, using both *etic* and *emic* categories, was used to analyse the students' responses.

Results: Only 377 (two thirds) of the 584 students who submitted the survey provided an answer to the question; approximately half of those in their first year and three quarters of those in their final year answered the question. Most responses demonstrated a very limited understanding of the meaning of EBP. Differences in EBP conceptualisations based on year level and discipline were negligible.

Conclusions: Across the sample subgroups, the majority of students in this study demonstrated a narrow understanding of EBP, largely devoid of the processes or principles that EBP scholars espouse. For EBP to achieve its full potential, undergraduate health students may require frequent and explicit exposure to all five steps of the EBP process. If new graduates do not understand EBP to be a contextualised, collaborative process, there is a risk that the potential value of EBP will continue to be compromised.

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WHAT DO UNDERGRADUATE HEALTH STUDENTS THINK IT MEANS?

Introduction

The concept of evidence-based practice (EBP) has evolved considerably since its "evidence-based medicine" beginnings in the early 1990s (Dawes et al., 2005; Djulbegovic & Guyatt, 2017). There is now more emphasis on the value and importance of clinical expertise, reasoning and collaboration with clients and colleagues in the EBP process (Drisko, 2017; Melnyk, Fineout-Overholt, Stillwell, & Williamson, 2010; Tanner, 2008). However, a range of criticisms continue to be levelled at EBP, such as: EBP prioritises randomised controlled trials (RCTs) above client voice and professional experience (Adams, Matto, & LeCroy, 2009; Berg & Slaattelid, 2017; Djulbegovic & Guyatt, 2017; Hoffmann, Bennett, & Del Mar, 2017; Wall, 2008); following EBP guidelines discourages critical thinking, professional autonomy and information seeking (Estabrooks, Floyd, Scott-Findlay, O'Leary, & Gushta, 2003; Mullen & Streiner, 2004; Swinkels, Albarran, Means, Mitchell, & Stewart, 2002); EBP guidelines pay too little regard to multi-morbidity (Goodman et al., 2014); and EBP guidelines can encourage a "cookbook" approach to care, reducing professional accountability and threatening clinical expertise (Mullen & Streiner, 2004; Swinkels et al., 2002). However, other authors argue that when applied appropriately (i.e., incorporating critical reasoning, respect for the client and consideration of context), EBP should not lead to such outcomes (Ioannidis, 2016; Rubin, 2015).

Those who believe that EBP means simply relying on research evidence to guide practice have good reason to question its practicality. EBP is seen by some practitioners to be unattainable, because research is often lacking on the questions practitioners seek information on, and when it is available, it is often difficult to find or comprehend (Harding, Porter, Horne-Thompson, Donley, & Taylor, 2014; Harvey & Kitson, 2015; Verloo, Desmedt, & Morin, 2017; Zwolsman, van Dijk, te Pas, & Wieringa-de Waard, 2013). Some practitioners feel, with good reason, that the amount of research evidence being published is overwhelming and too much to keep abreast of (Hoffmann et al., 2017; Ioannidis, 2016).

Such beliefs about EBP are arguably misguided but may partially explain why many health practitioners fail to engage in EBP (Saunders, Gallagher-Ford, Kvist, & Vehviläinen-Julkunen, 2019). Although published definitions of EBP vary slightly, it is typically described in the scholarly EBP literature (e.g., Dawes et al., 2005; Hoffmann et al., 2017; Melnyk et al., 2010; Rousseau & Gunia, 2016) as a question-in-context driven, client-centred process in which healthcare practitioners in situations of uncertainty seek out and judiciously incorporate relevant evidence in their professional decision making. EBP does not mean keeping abreast of, and acting on, all the research being published in one's field. Most EBP scholars agree that EBP involves formulating situation-targeted questions, acquiring relevant evidence and engaging in critical reasoning that takes into account the individual situations and informed preferences of clients and the characteristics of the given practice context.

EBP can be applied in many kinds of decision making, beyond just treatment selection. An EBP approach can be applied, for example, to questions regarding diagnosis, prognosis, prevention, prevalence, aetiology and economic benefit (Hoffmann et al., 2017; OCEBM, 2011) and also the lived experiences and concerns of healthcare consumers (Hoffmann et al., 2017; Rubin, 2012). Merely implementing *treatments* that have been empirically supported is not equivalent to engaging with the principles and processes of EBP (O'Halloran, Porter, & Blackwood, 2010; Rousseau & Gunia, 2016; Swinkels et al., 2002; Wall, 2008). EBP should not be seen as synonymous with "empirically supported treatments" (Patterson-Silver Wolf, Dulmis, & Maguin, 2012).

What constitutes evidence is another important consideration in defining EBP. In order to engage in EBP, practitioners must know when/if *research* evidence is potentially relevant, and they must know the different kinds of questions that can be informed by different forms of research evidence (Hoffmann et al., 2017). In addition, it is important to appreciate forms of evidence other than published research evidence, such as practice-based evidence (Carnwell, 2000; Meisel & Karlawish, 2011; Rousseau & Gunia, 2016). Other examples of non-research evidence that can inform defensible healthcare decision making include information about the availability and nature of local community services to support a client, the cost of potentially helpful equipment or the eligibility requirements of a grant that a health service is considering applying for.

EBP is typically described as a process involving five steps (Albarqouni et al., 2018; Dawes et al., 2005; Drisko, 2017; Hitch & Nicola-Richmond, 2017; Hoffmann et al., 2017; Malik, McKenna, & Griffiths, 2017; Melnyk et al., 2010; Rousseau & Gunia, 2016). High quality EBP requires practitioners to:

(1) *Ask*—recognise situations of uncertainty and translate that uncertainty into well-targeted, answerable, practically-useful questions, including asking questions on behalf of clients when clients do not ask the questions they should

(2) *Acquire*—gather the best evidence available on those questions and any other information that is relevant to consider, efficiently utilising accessible information resources and avenues

(3) *Appraise*—judge the collected evidence for its applicability to their situation, its validity or trustworthiness and its clinical meaningfulness

(4) *Apply*—act on the evidence, as appropriate, based on critical reasoning that takes into account (as relevant) their own clinical experience, the experience of more senior colleagues, their clients' informed preferences and the contextual constraints of the situation they are in

(5) *Assess*—evaluate their EBP reasoning processes and the outcomes of their decisions to build practice-based evidence and experience-based wisdom for their future practice.

Recognising and admitting uncertainties and cultivating a spirit of enquiry among colleagues have been noted as critical precursors to step 1 (Charania, Ross-Durow,

Sullivan, & Danse, 2018; Dawes et al., 2005; Melnyk et al., 2009). Grady and Drisko (2014) also emphasised that thorough client assessment is a critical foundation of EBP because of its importance in searching for and prioritising evidence that is most relevant to the specific needs of the client. Sharing EBP learnings with other practitioners and/or service managers, as relevant, is also important for capitalising upon the value of the EBP process (Melnyk et al., 2010). Quality EBP is a highly collaborative process, requiring purposeful communication with clients (Drisko, 2017; Hasnain-Wynia, 2006) and colleagues (Melnyk et al., 2010).

Although EBP experts share a generally unified understanding of the meaning of EBP (Albarqouni et al., 2018; Clyde, Brooks, Cameron, & Salbach, 2016; Johnston, Leung, Fielding, Tin, & Ho, 2003; Leung, Trevena, & Waters, 2018; Salbach & Jaglal, 2011; Saunders et al., 2019), there has been little research attention given to the EBP conceptualisations of healthcare practitioners or that of students destined to become future practitioners. The available evidence indicates significant "misconceptions, misinterpretations, and misunderstandings of what actually constitutes EBP" among large proportions of practising healthcare professionals, which undermines potential engagement in EBP (Saunders et al., 2019, p. 181).

Aim

It is possible that current-day graduates are bringing a contemporary and sophisticated understanding of EBP into their respective professions. However, no research to date has investigated student notions of EBP. The aim of the current study was to examine undergraduate health students' conceptualisations of EBP and to compare these conceptualisations on the basis of students' year level and discipline.

Methods

Design

The current study drew on data from a broader survey in which students in 20 undergraduate health degree courses at Charles Sturt University were invited to respond to a primarily quantitative, anonymous, online survey about their experiences and perceptions regarding research in their learning and their profession (see Murphy et al., 2018). The current study involved a content analysis of the students' responses to one open-ended question within the survey: "What does evidence-based practice mean to you?" There was no word limit on the students' answers to this question. The Charles Sturt University Human Research Ethics Committee approved this research (Protocol Number H17113).

Survey distribution

The survey was emailed to all students at the beginning of session 2 (midway through the academic year) and remained open for 3 weeks. The students were initially contacted via a generic course-level email. The email included a link to the participant

information sheet and survey. The email message conveyed the research team's interest in "negative, neutral and positive views students have" and encouraged responses from students regardless of whether they knew "very little or a lot" about research and EBP. Voluntary informed consent was deemed to have occurred if a student chose to proceed. In addition, all academics teaching subjects in the target courses were asked to assist in promoting the survey to their students by including the link in their subject site announcements and/or by verbally encouraging students to complete the survey outside of their class time.

Analysis

To compare the responses by year level and discipline, basic content analysis was used (Drisko & Maschi, 2016). Specifically, steps 3 and 4 of Druckman's (2005) method of content analysis were employed. Step 3 is to develop a conceptual framework for the content analysis system. In the current study, the above-described principles and processes espoused in the scholarly literature on EBP formed the conceptual framework. Step 4 is to define the categories in the system. The students' responses were categorised based on the elements of EBP that were present in each response (see more detail below and in Table 2).

According to Druckman (2005), analysing content into theoretically-based predetermined categories represents an *etic* approach. An etic approach is considered appropriate for testing the applicability of pre-existing theories and hypotheses (Willis, 2007). The etic categories used in the current content analysis reflected the following EBP principles and processes: asking questions when uncertain, seeking specific types of evidence for specific types of questions, strategically searching for relevant evidence, critically appraising the relevance and quality of the evidence found, engaging in a reasoning process when deciding how to apply the evidence, incorporating professional experience in the reasoning process, informing the client about relevant evidence, incorporating client input in the reasoning process, clinician reflection and evaluation, and sharing evidence and learning with colleagues.

It was deemed appropriate to use a primarily etic approach, using pre-determined categories, to (a) know the extent to which students understand EBP in line with a pre-existing conceptual framework and (b) make comparisons between groups (Druckman, 2005). However, an *emic* approach (Druckman, 2005) was also taken in this study, in that new categories were created to capture unexpected concepts that arose in the students' responses, using the common method of constant comparison (Skeat, 2013). An emic approach was deemed appropriate as it was possible that students might have unanticipated views that warrant consideration in efforts to improve EBP curricula. This dual approach is similar to that used by DeCuir-Gunby, Marshall and McCulloch (2011).

Inter-coder reliability was established during the analysis process. A detailed etic coding system was drafted by the principal researcher (based on the above-described EBP literature), and the wording was refined in discussions with the research team. The coding system was then applied to the first 50 students' responses by the principal

researcher, during which time the etic codes were further refined to increase the precision and reduce ambiguity in the wording, and the emic codes were created as needed and similarly refined. Two other research team members then independently applied the complete coding system for the first 50 student responses in the database. Agreement was achieved between the principal researcher's coding of a student's response and the coding of at least one of the other coders in at least 90% of cases. All three coders agreed in 78% of cases. Where discrepancies occurred, it was almost always a case where two or more EBP elements were present: one element was identified/agreed, but a second element was initially missed by one coder. Upon brief discussion, all discrepancies were resolved. The principal researcher continued to code all cases independently, using the established coding system.

Frequencies and percentages were calculated for each EBP category/code, and comparisons were made across student year levels and school-based discipline clusters.

Results

A total of 584 students from the 20 undergraduate health degree courses responded to the online survey. A breakdown of the whole survey sample by course is presented in Table 1. The nature, level and sources of EBP training varied (across all the subjects in each course), but generally there was more focus on EBP skills in the research-focused subjects than in the clinically-focused subjects (Murphy et al., 2018; Murphy et al., 2019).

Of the 584 students who responded to the survey, 377 (65%) elected to answer the question "What does evidence-based practice mean to you?" Most responses to the question were very brief, for example, *"Applying methods of practice that have been researched"* (Y1, Response 6) and *"Working within guidelines which are up to date with the newest research"* (Y3, Response 3). Some responses were more complex, for example, *"Standards and methods of practice that are created to reflect and be derived from the findings and results of research and experimentation that were able to prove the validity, necessity and accuracy of the practice"* (Y2, Response 4) and *"The practice involves the combination of clinical expertise, most recent proven research and patient values in the decision-making process"* (Y3, Response 11).

Nearly 36% of the total sample mentioned "research", "science" or "studies". Few mentioned any other concept drawn from the EBP literature. For example, less than 7% mentioned that EBP involved "decision-making" or "reasoning". A summary of these results is presented in Table 2.

An increase in the proportion of students who responded to this question, from Year 1 to Year 4, was noted (see Figure 1). Compared with approximately half of the students in Year 1, about three quarters of Year 4 students responded to this question. As can be seen in Table 2, there was a slight tendency towards an acknowledgement of the role of client input in higher year levels—while only 3% of students in Year 1 and 2.1% of students in Year 2 mentioned that EBP involves client input, this element of EBP was mentioned by 4.9% and 8% of Year 3 and 4 students, respectively. However, in general, the differences between year levels were negligible and followed no discernible pattern.

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Table 1
Courses of All Students Who Responded to the Survey Containing the Question "What Does Evidence-based Practice Mean to You?"

Bachelor course	N of students	% of total sample
B Clinical Practice (Paramedic)	61	10.4
B Clinical Science	8	1.4
B Dental Science	13	2.2
B Exercise and Sport Science	14	2.4
B Health and Rehabilitation Science	26	4.5
B Health Science (Complementary Med)	21	3.6
B Health Science (Food and Nutrition)	14	2.4
B Health Science (Mental Health)	4	.7
B Medical Radiation Science	50	8.6
B Medical Science	45	7.7
B Nursing	107	18.3
B Occupational Therapy	8	1.4
B Pharmacy	7	1.2
B Physiotherapy	57	9.8
B Podiatric Medicine	11	1.9
B Psychology	1	.2
B Social Science (Psychology)	3	.5
B Social Work	49	8.4
B Social Welfare	42	7.2
B Speech and Language Pathology	17	2.9
B Vet Biology/Vet Science	12	2.1
No course selected	14	2.4
Total	**584**	**100%**

The content of students' responses by school-based discipline cluster is represented in Table 3. Students studying biomedical science courses explicitly mentioned the role of research evidence more often (42%) than students in the other courses. Nursing (28%) and social care students (32%) least frequently mentioned research. Students studying allied health courses most frequently mentioned the role of practitioner experience (8.4% and 9.5%). Overall, in no discipline cluster was there a high proportion of students who showed a full understanding of the meaning of EBP.

Emic (or unanticipated) concepts that arose in the respondents' answers are listed in Table 4. The most frequently mentioned notion—mentioned by over 18% of all survey respondents—was that EBP means practices that are "proven" or "effective". There was also a relatively frequent focus on the quality of the evidence underpinning EBP (11%). For some students, EBP meant keeping up to date (10%) and good or high quality practice generally (8%).

Table 2

Percentages of All Respondents Mentioning Elements of EBP in Their Response to the Question "What Does EBP Mean to You?" [a]

Elements of EBP	% of those answering the question n = 377	% of all respondents n = 584	% of all, by year level [b]			
			Y1 n = 201	Y2 n = 146	Y3 n = 185	Y4 n = 46
EBP means asking questions when uncertain	0.0	0.0	0	0	0	0
EBP involves searching for or acquiring evidence	1.3	0.9	1.0	0.7	5.0	2.0
EBP involves research evidence	55.4	35.8	34.5	32.2	40.2	38
EBP involves evidence other than research evidence	0.0	0.0	0	0	0	0
EBP involves critically appraising evidence	2.1	1.4	0	1.4	2.7	2.0
EBP incorporates professional/clinical experience	7.7	5.0	6.0	3.4	3.8	10
EBP involves decision making or reasoning	10.6	6.8	6.5	4.8	8.7	8.0
EBP involves informing clients about evidence or reasoning	0.0	0.0	0	0	0	0
EBP involves client input	5.8	3.8	3.0	2.1	4.9	8.0
EBP involves reflecting on decisions or evaluating outcomes	0.3	0.2	0	0.7	0	0
EBP involves sharing your learning or influencing others	0.3	0.2	0	0	0.6	0
No answer given	NA	35.4	47.5	35.6	26.1	24

a Columns do not total 100% because not all responses included a listed EBP element, and some responses included more than one element.
b Six students did not select a year level in the survey.

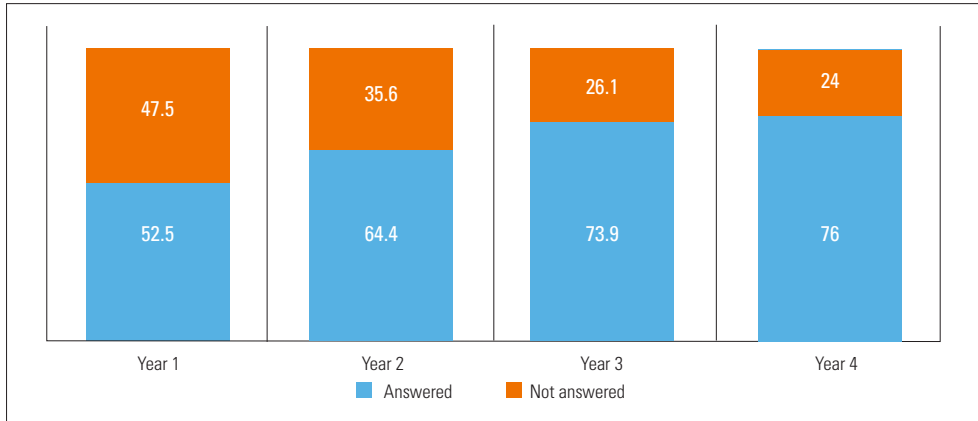WHAT DO UNDERGRADUATE HEALTH STUDENTS THINK IT MEANS?

Figure 1. Increasing proportions of students in each year level answered the question "What does EBP mean to you?"

Table 3

Percentages of All Respondents in Each Discipline Cluster Who Mentioned Elements of EBP in Their Response to the Question "What Does EBP Mean to You?" [a]

Elements of EBP	% of total, by discipline cluster				
	Biomed n = 157	AH1 n = 62	AH2 n = 119	Nursing n = 111	Social n = 91
EBP means asking questions when uncertain	0	0	0	0	0
EBP involves searching for or acquiring evidence	0	3.2	0.8	0	1.1
EBP involves research evidence	41.7	36.5	38.7	27.8	31.9
EBP involves evidence other than research evidence	0	0	0	0	0
EBP involves critically appraising evidence	1.9	0	0.8	1.8	1.1
EBP involves professional/clinical experience	2.6	9.5	8.4	2.7	3.3
EBP involves decision making or reasoning	9.0	6.3	5.0	5.4	5.5
EBP involves informing clients about evidence or reasoning	0	0	0	0	0
EBP involves client input	3.8	4.8	5.9	2.7	1.1
EBP involves reflecting on decisions or evaluating outcomes	0	0	0.8	0	0
EBP involves sharing your learning or influencing others	0	0	0	0.9	0
No answer given	38.5	41.3	31.1	32.4	35.2

Note: Discipline clusters (schools) with low response counts were excluded. Students in respective schools undertake different research-focused subjects. BMS = biomedical focus; AH1 = allied health courses offered by one school; AH2 = allied health courses offered by another school; Nursing = nursing courses; Social = social health focus

a Columns do not total 100% because not all responses included a coded EBP element, and some responses included more than one element.

Table 4

Percentages of All Respondents Who Mentioned Unanticipated Concepts in Response to the Question "What Does EBP Mean to You?" [a]

Emerging concepts	% of total sample (n = 584)	% of who answered (n = 377)
EBP means practices that are *proven* or *effective*	18.3	28.4
EBP means basing practice on *high quality evidence*	11.3	17.5
EBP means staying up to *date* or *current*	9.6	14.9
EBP means *good* or *high quality* practice	7.9	12.2
EBP is about *treatments*	5.5	8.5
EBP means practice(s) "based on evidence"	3.9	6.1
EBP includes specified practice(s) *other than* treatments	2.7	4.2
EBP is important	2.1	3.2
Cynical response	1.2	1.9
EBP means acting within published guidelines	0.7	1.1
No answer given	35.4	NA

a Columns do not total 100% because not all responses included a listed EBP element, and some responses included more than one element.

Discussion

The aim of this study was to explore the meanings that undergraduate students attribute to EBP and to investigate whether these meanings differ based on year level or discipline. While previous research has assessed students' EBP knowledge and skills, particularly following targeted educational interventions (e.g., Bennett, Hoffmann & Arkins, 2011; Ruzafa-Martínez, López-Iborra, Barranco, & Ramos-Morcillo, 2016), this is the first study to investigate students' impromptu notions of what EBP *means*. The purpose was to assess the extent to which contemporary sophisticated notions of EBP are infiltrating the understandings of soon-to-be health graduates.

Over 500 students were surveyed from 20 undergraduate health degrees at Charles Sturt University. As year level increased, from first to fourth year, more students offered *some* notion of EBP in response to the question "What does EBP mean to you?" There were slight differences between the EBP conceptualisations of students in different year levels and courses; however, these differences were negligible. Overall, the students' notions of EBP tended to be devoid of many elements believed to be important by EBP scholars. Over one third of the survey respondents mentioned research (e.g., studies, science, experiments). The next most frequently mentioned concept was "proven" or "effective" practice. Over one third of the survey respondents did not provide an answer to this question at all, including approximately one quarter of students in their final year, possibly indicating a lack of engagement with the notion of EBP in general.

It is worrying that few students in any health profession in the current study seemed to understand that EBP is more than just adopting researched practices. While discipline-based differences in the current study were few, other research has found that different health professions have differing views regarding EBP. Varying levels of importance

are placed on EBP in different health professions (Snibsøer, Graverholt, Wammen Nortvedt, Riise, & Espehaug, 2018). Research by Leung et al. (2018) uncovered differing views among nursing, medical and allied health experts regarding what should be considered benchmark EBP competencies in graduating health professionals. These differences are not necessarily a concern; however, it is problematic if views on EBP are based on inconsistent or incomplete understandings of what EBP means.

Based on the notions of EBP expressed in this study, many respondents might carry working definitions of EBP into their professional futures that could attract the earlier-mentioned criticisms historically levelled at EBP. This could undermine the potential good that EBP might otherwise achieve in the future. For example, it is problematic if students are not learning the essential role of recognising uncertainty and *asking questions* in EBP or the importance of respectful collaboration with clients and colleagues in EBP. It is certainly worrying if, based on a narrow understanding of what EBP means, graduates might engage in practice that is not client-centred (Engebretson, Mahoney, & Carlson, 2008; Ioannidis, 2016).

The results of this study may partly be explained by the components of EBP that receive most emphasis in undergraduate health professional education. Although EBP authors recommend that the focus of education should be on all five steps of the EBP process, health professional training tends to predominantly focus on knowledge and skills related to steps 2 and 3—acquire and appraise (Charania et al., 2018; Dawes et al., 2005; Malik et al., 2017; Murphy et al., 2019; Patelarou et al., 2017). Publications such as the Sicily Statement on EBP (Dawes et al., 2005) emphasise the importance of a commitment to client education and shared decision making, and to taking a critical, enquiring approach to practice in general. However, such attitudes espoused in the scholarly EBP literature are rarely the focus in EBP curriculum evaluation research. This may be because attitudes required for EBP (e.g., a commitment to a questioning approach to practice, and to informed, shared decision making) can be more difficult to teach and assess compared with the more concrete steps involved in finding and appraising research articles.

On the matter of appraising research evidence, Dawes et al. (2005) highlighted the importance of considering the "real-time setting" of clinical practice (p. 4). Critical appraisal involves interpreting research-based information in a systematic manner, assessing the validity of the conclusions as well as their relevance and meaning in relation to the situation at hand (Dawes et al., 2005; Horsley et al., 2011). Research appraisal can involve assessing (a) the suitability of the type of research for the question, (b) possible sources of bias leading to distorted or untruthful findings, (c) the reliability of measurement tools used in the research, (d) the appropriateness of the data analysis methods used and (e) the clinical meaningfulness of the findings (Dawes et al., 2005). In practice, however, evidence usually needs to be acquired and appraised "in minutes, rather than hours", so students must learn to find and appraise research evidence purposefully and efficiently, utilising pre-appraised resources where these exist (Dawes et al., 2005, p. 4). In any case, teaching practitioners critical appraisal skills is of little worth if those skills are not contextualised as part of EBP (Horsely et al., 2011).

Learning that a research study has found a treatment to be effective might lead a practitioner to select that particular treatment in their practice. In Schatzki's (2002) terms, implementing such a treatment might be considered an example of a "dispersed" (or specific, isolated) practice (p. 77–80). However, EBP might be more appropriately viewed as a higher-order "integrative" practice (Schatzki, 2002, pp. 77–80). According to Schatzki, integrative practice "links" dispersed practices together through "moral principles" and "general and practical understandings" (p. 77–80). Schatzki's two-tiered nomenclature of practice (dispersive versus integrative) mirrors the two levels at which EBP seems to be understood. While EBP scholars seek to emphasise EBP as an "integrative" practice—an *approach* to practice that integrates conceptual knowledge, clinical reasoning and collaborative skills, and particular attitudes—the current study shows that even towards the end of their training, many health students think of EBP as singular "dispersed" practices. That is, rather than understanding EBP to be a way of practising (questioning, critically reasoning, etc.), many students believe EBP means simply doing practices that are supported by research evidence.

For EBP to achieve its potential, we believe health professional educators should raise the idea of EBP explicitly and frequently with students, as a contextualised, collaborative, integrative practice whereby clients are ultimately empowered to be informed contributors to their healthcare decision making. Educators should specifically raise students' awareness of problems associated with narrow and unbalanced conceptualisations of EBP. The results of this study suggest that, currently, this may not be occurring in an effective way. While there appeared to be increasing levels of *familiarity* with EBP, there was no discernable development in students' *understanding* of EBP across year levels.

Explicitly and frequently exposing students to all five steps of EBP might help to increase the sophistication of students' notions of EBP. EBP skills and attitudes should be explicitly labelled as such and affirmed when exhibited by students in teaching/learning contexts. For students to adopt an EBP approach to their practice, they need to be taught more than just how to find and critically appraise research. Students should be encouraged to:

- unashamedly recognise and admit uncertainty, translate it into worthwhile, answerable questions, and identify the kind(s) of evidence needed to answer those questions to helpfully inform their decision making (Step 1, Ask)
- investigate promising avenues to acquire what relevant evidence is available, seeking the support of a health librarian where relevant and possible (Step 2, Acquire)
- where research evidence is obtained, seek peer or supervisor support, if necessary, to efficiently appraise the relevance and validity of the findings within the time constraints of real-world clinical practice (Step 3, Appraise)
- share the acquired information and respectfully seek the input of clients and more expert colleagues to help decide how to act on that information (Step 4, Apply)
- continually assess the processes and outcomes of their EBP decision making, taking opportunities to share their learning with colleagues (Step 5, Assess).

Clinical placements provide valuable opportunities for learning EBP skills and attitudes (Fiset, Graham, & Davies, 2017; Hitch & Nicola-Richmond, 2017; Murphy et al., 2018; Towns & Ashby, 2014; Westwater-Wood, Hendrick & Diver, 2014), but EBP proficiency should ideally be developed and reinforced across the curriculum (Murphy et al., 2019). If all five steps are explicitly and frequently identified as important aspects of EBP by their clinical supervisors as well as their academic teachers, fewer students might develop the limited notions of EBP expressed in the current study. Ultimately, practitioners of the future might come to understand EBP to be a sensible, practical and appealing way to practise, and the persisting "widespread confusion" and lack of engagement in EBP (Saunders et al., 2019, p. 181) might be overcome.

Limitations

This study involved a survey of undergraduate students. The analysis was limited to a basic content analysis of students' off-the-cuff responses to a single open-ended question. Had the students been prompted to provide more in-depth responses, it is likely that some students would have mentioned additional EBP concepts. It is also likely that the broader survey's focus on the use of research evidence in practice might have primed some students to focus on research when thinking about what EBP meant. That said, arguably, students' impromptu reactions to "What does EBP mean to you?" provide an authentic indication of the concepts that they most readily associate with EBP. If additional concepts were considered equally important aspects of EBP, these concepts would likely have been noted as well.

The current survey was restricted to students studying at one university. Students studying at other universities may have different, and perhaps more sophisticated, notions of EBP. The different courses sampled in this study provided varying levels of EBP exposure and training, mostly through research-focused subjects (Murphy et al., 2018). Given that there was so little difference between the students studying different courses at this university, it seems unlikely that the responses of students studying health degree courses at other universities would be substantially different from those collected in the current study. However, it is likely that students studying courses with greater integration and reinforcement of EBP concepts would be found to have a deeper understanding of EBP (Fiset et al., 2017; Murphy et al., 2019).

Conclusions

In the literature, EBP is understood to be a client-centred, collaborative process of enquiry and critical reasoning to facilitate defensible healthcare decision making on all kinds of questions that health professionals might ask. Most students in this study demonstrated little awareness of the meaning, processes or principles of EBP, and negligible differences were observed between disciplines or year levels. Mostly, the students seemed to think that EBP comprises specific practices that have been researched or proven. Such practices can, of course, be part of EBP. However, adopting such practices *per se* does not constitute EBP and will not necessarily result in improved healthcare quality or outcomes.

If new graduates carry the simplistic conceptualisations of EBP uncovered in this study into the future healthcare workforce, there is a risk that the very reasons to reject EBP will only be reinforced and the potential benefits of EBP will continue to be undermined. Developing EBP knowledge, skills and attitudes in undergraduate students—future graduates—is a complex endeavour that requires a concerted effort by academics and clinical supervisors. To fully engage in EBP in their careers, we believe that undergraduate students should be (a) reminded frequently of what EBP means and (b) explicitly taught to master all five steps of EBP, not just steps 2 and 3.

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