

ORIGINAL RESEARCH

Searching for an answer: Faculty strategies to ensure advanced practice nursing student ability to select quality reference sources to guide clinical decision making

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Abstract

Objective: Nursing faculty in advanced practice programs are challenged in providing guidance to their students on the appropriate use of a vast array of resources to inform practice decisions. The purposes of this exploratory pilot study were to 1) identify reference sources faculty consider essential for use in clinical practice, 2) describe faculty strategies for assisting students in the selection of quality reference sources for answering clinical questions, and 3) evaluate if strategies or resources utilized vary according to type of course taught, years of teaching experience, years in clinical practice, and type of advanced nursing preparation of the faculty member.

Methods: Graduate faculty (N = 33) from a distance education university completed an investigator created survey in a cross-sectional descriptive pilot study.

Results: Findings indicate that faculty acknowledge their students require guidance in the selection of quality references, however, there is lack of consensus for those reference sources that are considered of high quality.

Conclusions: Consensus building among faculty as to what constitutes quality reference sources which will guide practice decisions is essential before a consistent message regarding quality evidence-based sources can be provided to students throughout the curriculum.

Key words

Teaching strategies, Advance practice nurse, Advanced practice nurse education, Evidence-based practice

1 Introduction

The utilization of evidence-based information is essential to quality practice in the health care setting, yet graduate students preparing for an advanced practice clinical role are confronted with an overload of information that may be utilized to guide practice decisions. While in the academic setting students have access to a full array of information sources (e.g., faculty members, academic library, and reference librarian) when searching for quality evidence to answer

clinical questions. In spite of the availability of these resources, students struggle with identifying the most pertinent reference sources and evaluating retrieved evidence for accuracy and timeliness. As students transition into the advanced practice role and enter the clinic setting, the need for expediency in finding evidence-based answers to clinical questions becomes of primary importance. This presents the novice practitioner with a dilemma if they have not developed the skills or knowledge required to select the highest quality evidence for answering clinical questions. The charge then is placed upon advanced practice nursing faculty to guide students in developing the skills necessary to critically evaluate research evidence within the context of each patient encounter.

1.1 Background

The demand to find answers to clinical questions quickly and reliably has led to the widespread use of point-of-care (POC) evidenced-based summaries such as *Dynamed* and *Essential Evidence Plus*. The purpose of these summaries is to provide the health care provider with synopses of the most current scientific evidence available^[1], however, significant limitations may impact their accuracy. For example, in order to retrieve accurate information, research must have been published on the topic, and search terms must match those used by the summary author. Additionally, significant delays in dissemination may exist due to time between original publication date, analyses by editors, and subsequent publishing of the evidence summary. Banzi and colleagues' ^[2] bibliometric analysis of five POC information summary sources revealed that incorporation of new evidence into their databases ranged from less than 50% to 85% at nine months. While proficient advanced practice nurses can quickly evaluate retrieved recommendations for accuracy, timeliness, and relevancy, the student or novice practitioner may not have the knowledge base to critically evaluate retrieved information for applicability to a particular patient situation.

The following example highlights the drawbacks of sole reliance on POC summaries. A clinical case scenario in an advanced practice nursing course asked students to identify the recommended solution for cleansing a traumatic wound prior to suturing. The student learning team recommended irrigating and cleansing the wound with an iodine solution and cited *Dynamed* as the source. The faculty member, who is an experienced practitioner, knew the answer retrieved was incorrect. Iodine is no longer recommended for use in cleansing traumatic wounds^[3] yet the source the students utilized was considered trustworthy, and the information retrieved was accepted as accurate and reliable.

Finding answers to questions posed in clinical case scenarios may be quite time consuming for students depending on the questions asked, the source(s) utilized for finding the answers, and the number of on-line references retrieved. In the clinical case scenario described above, the student learning team retrieved the information from *Dynamed* in less than one minute by utilizing the search terms *wound cleansing for suturing*. The recommendation cited was to use providone-iodine solution plus scrubbing for 60 seconds and was listed as *level 2* evidence^[4]. The link to the evidence supporting this recommendation led to an article in the *Annals of Emergency Medicine* dated 1987^[4]. The student learning team failed to investigate the source or date of the cited evidence. If this information was being retrieved via *Dynamed* in a clinic setting while a patient was waiting to be sutured, the novice advanced practice nurse may have selected an inappropriate solution. Banzi and colleagues^[2] note that the intended audience of POC evidence summaries are practitioners who are able to evaluate new information and weigh this in light of current practice. The use of these summaries is understandable, yet students and novice providers may not have the knowledge base to evaluate the answer(s) retrieved before using the information to guide practice decisions.

Alternatively, searching large databases for answers to clinical questions also presents unique challenges. To highlight these challenges, the lead author conducted a search to obtain the most current evidence regarding the best solution for irrigating and cleansing traumatic wounds using *Medline*, *CINAHL*, *Health Source: Nursing/Academic Edition* and *Academic Search Premier*. The initial search, utilizing search terms *laceration* and *cleansing*, resulted in only two articles. Both articles compared pressurized saline versus syringe irrigation of wounds for laceration cleansing but did not address the recommended solutions for wound cleansing. The author then changed the search term *cleansing* to *solution* and three non-relevant articles were retrieved. The search term *laceration* was then changed to *wound* which resulted in 166 sources.

By limiting the search to *full text, academic journals, and publication dates within the past 10 years*, this number was reduced to 16. Each of the 16 articles was related to *pressure* rather than *traumatic* wound cleansing. This search took approximately 30 minutes and still failed to provide an answer to the question of the most appropriate solution for traumatic wound cleansing.

An observational study of 23 physicians seeking answers to simulated clinical questions found electronic sources did not consistently provide the ability to locate the correct answers, and approximately 11% of questions answered correctly *before* utilization of electronic sources were noted as incorrect based on the electronic sources' recommendations^[5]. Finding accurate answers to clinical questions in an expeditious manner in the busy practice setting is essential, yet as the previous examples highlight, numerous barriers exist in this quest. Students are at a particular disadvantage if they have not been prepared to analyze and critique information obtained from POC evidence summaries, or are unaware of key alternative reference sources for finding evidence-based information.

There are many issues related to guiding students in finding answers to clinical questions accurately and expeditiously. Before finding answers to clinical questions for patient care decisions several obstacles must be overcome. The student/clinician must 1) formulate the appropriate question, 2) identify a systematic process for seeking information, 3) formulate an answer, and 4) utilize the answer to direct patient care^[6]. A qualitative study of physicians' use of clinical resources identified the primary obstacle to seeking answers to clinical questions was the lack of answers in selected resources^[7]. Other obstacles to answering clinical questions that have been identified by primary care providers are lack of user friendly literature search engines^[8] and the absence of research evidence regarding the specific clinical situation in question^[9-11].

In preparing nurses for advanced practice roles, educators must address these obstacles and assist students in learning processes for seeking evidence-based information through a variety of sources. In order to create innovative teaching strategies for facilitating the student's ability to answer clinical questions expeditiously and accurately, it is important to analyze current faculty practice in this area and the sources they consider essential for answering patient management questions.

1.2 Purpose

The purposes of this study were to 1) identify reference sources faculty consider essential for use in clinical practice, 2) describe faculty strategies for assisting students in the selection of quality reference sources for answering clinical questions, and 3) evaluate if strategies or resources utilized vary according to type of course (i.e., foundational or track-specific), years of teaching experience, years in clinical practice, and type of advanced nursing preparation of the faculty member.

2 Methods

2.1 Design and setting

This pilot study used an exploratory cross-sectional descriptive design. IRB approval was obtained from the institution for this research project and participants were provided written informed consent before completing study procedures. The setting for the study is a distance education program that provides advanced nursing education in nurse midwifery, family, and women's health specialties. At the time of study initiation, this university employed 52 faculty teaching didactic courses. The majority of faculty (52%, n = 27) reported Doctorate of Nursing Practice (DNP) as the highest degree attained, 24% (n = 13) reported PhD preparation, and 24% (n = 13) were prepared at the MSN level. All faculty work from home offices and are located throughout the United States. Faculty travel to the primary campus several times a year to facilitate courses on physical assessment, office procedures, and clinical case presentations. All other course content is delivered in an online format.

2.2 Sample

All faculty teaching didactic courses were recruited to complete the study. A total of 52 faculty members were eligible to take the survey and 35 were returned, giving a response rate of 67.3%. Two of the surveys were eliminated due to incomplete responses resulting in a final sample size of 33 participants, or 63% of the faculty. All participants are prepared in advanced practice roles. The majority (66.6%, $n = 22$) of respondents maintain an active clinical practice, with 15 reporting family practice settings and seven in women's health and/or nurse midwifery roles. Sixteen (48.5%) participants teach in the family nurse practitioner track while 13 (29.4%) were in the women's health nurse practitioner and midwifery tracks. The remaining four participants were teaching in the ADN to MSN courses or DNP program. Fifteen (45.5%) taught a foundational course for all MSN students while 63.6% ($n = 21$) taught a course focused within a particular track. The years of advanced clinical practice experience varied with 45.5% ($n = 15$) having over 15 years in practice and 27.3% ($n = 9$) with less than 10 years in the APN role. The majority 63.6% ($n = 21$) of faculty had over five years of teaching experience (see Table 1).

Table 1. Sample characteristics

Variable	Frequency (%)
Teaching Track	
FNP	16 (48.5)
CNM/WHNP	13 (29.4)
ADN-MSN or DNP	4 (12.1)
Type of Course Taught	
Foundational Course	15 (45.5)
Specific Clinical Course	21 (63.6)
Current Clinical Practice	
Family Practice	15 (68.2)
CNM/WHNP	7 (31.8)
Years in Advanced Clinical Practice	
>15 years	15 (45.5)
11-15 years	9 (27.3)
6-10 years	4 (12.1)
< 6 years	5 (15.2)
Years of Teaching Experience	
>15 years	12 (36.4)
11-15 years	4 (12.1)
6-10 years	5 (15.2)
< 6 years	12 (36.4)

2.3 Procedure

Participants completed an investigator developed survey at an annual faculty meeting or online via a secure web-based survey application. The first page of the survey included informed consent and participants acknowledged receiving and providing informed consent through completion and submission of the survey. Twenty-four faculty completed a paper and pencil survey and 11 faculty completed the survey online. Participation was voluntary and all survey responses were gathered anonymously.

2.4 Data analysis

Due to the exploratory nature of this pilot study, descriptive statistics and frequencies were calculated and utilized to inspect study variables. Chi-square was used to assess differences in study variables by years of teaching experience

(i.e., ≥ 10 years vs. < 10 years, type of advanced practice nursing role (i.e., family vs. nurse midwife/women's health), active clinical practice, and type of course taught (i.e., foundational vs. track-specific).

3 Results

3.1 Resources utilized by faculty within the clinical setting

Participants who were in active clinical practice (n=22) reported the use of a wide range of reference sources within the clinical setting. Guidelines published by professional organizations such as the American Diabetes Association and the American Academy of Dermatology were frequently used by participants as were governmental resources such as the Centers for Disease Control, National Institutes of Health, and the Agency for Healthcare Research and Quality. *The Sanford Guide* and *UpToDate* were both utilized by approximately 60% of participants.

The types of print references deemed as essential within the clinic setting varied by specialty. Family nurse practitioners reported frequent use of sources related to dermatology, musculoskeletal assessment and management, office procedures, and comprehensive single source references (see Table 2). Less consistent use of specific references was found within the women's health specialties but included *Clinical Practice Guidelines for Midwifery & Women's Health* [12], *Women's Gynecologic Health* [13], *Williams Obstetrics* [14], and *Obstetrics: Normal and Problem Pregnancies* [15].

Table 2. Non web-based resources essential for practice by family nurse practitioner faculty (N = 15)

Subject Area	Title (s)	n (%)
Dermatology	Fitzpatrick's Color Atlas & Synopsis of Clinical Dermatology [19]	13 (87)
	Clinical Dermatology: A Color Guide to Diagnosis and Therapy [20]	
Musculoskeletal Assessment and Diagnosis	Essentials of Musculoskeletal Care [21]	10 (67)
Procedures	Pfenninger & Fowler's Procedures for Primary Care [22]	5 (33)
Single Source Reference for Clinical Diagnoses and Management	Current Medical Diagnosis & Treatment 2014 [23]	8 (53)
	Five Minute Clinical Consult [24]	
Infectious Disease	Red Book: 2012 Report of the Committee on Infectious Diseases [25]	4 (27)

3.2 Facilitation of student selection of quality references

Less than half of the participants, 48.6% (n = 17), reported that students in their courses demonstrated the ability to select quality reference sources for assignments. When guiding students in the selection of quality references, 75.8% (n = 25) of faculty provided students with a description of what they considered to be quality reference sources through course guidelines. Additionally, 66.6% (n = 22) also provided a description of what they considered to be *poor* reference sources. When approached by an individual student for assistance in finding applicable references, participants most frequently reported: (a) directing students to the most appropriate reference materials (69.7%, n = 23), and (b) discussing with the student *how* to select appropriate sources (72.7%, n = 24). Over half of participants (51.5%, n = 17) indicated they would never recommend conducting a *Google Scholar* search while 12.1% (n = 4) of participants indicated they frequently direct students to this search engine. Suggesting the use of a reference librarian was an infrequently utilized strategy (27.3%, n = 9).

Methods used to facilitate selection of quality reference sources did not vary by years of teaching experience, type of advanced practice nursing role, or current clinical practice. There was a statistically significant difference detected with type of course taught and recommending the assistance of a librarian. Participants teaching a foundational course taken by all graduate students were more likely to send students to a librarian than those who were teaching a course within a specific track ($\chi^2 = 5.22$, $df = 1$, $p = .22$).

The use of timely reference sources for assignment completion were required by the majority of participants (91%, n = 30). The sources referenced must have been published within the past five years with exceptions made for the use of seminal articles when appropriate. Two participants (6%) reported placing no restrictions related to the age of reference sources. Of the participants who reported teaching patient care management courses (n = 25), the use of electronic POC evidence summaries such as *Dynamed* or *Essential Evidence Plus* for assignment completion was *frequently* or *almost always* permitted by 60.5% (n = 15) while 40% (n = 10) *never* or *infrequently* permitted the use of these sources. The use of these summaries as references for assignment completion in patient care management courses did not vary by years of teaching experience or years of clinical experience.

4 Discussion

Study findings demonstrate that faculty acknowledge the importance of guiding students in the selection of quality and timely clinical resources. Concerning, however, is the finding that over 60% of the faculty participants allow the use of POC references such as *Dynamed* and *Essential Evidence Plus* for assignment completion. The results also highlight there is concern among faculty related to the ability of students to select quality reference sources; less than half of faculty participants reported their students demonstrated the ability to select quality resources. Although course guidelines describing appropriate and inappropriate reference sources were utilized by a majority of faculty, these methods were not universally employed. A majority of faculty also reported providing specific directions to students and engaging in discussions related to selecting appropriate sources when approached on an individual basis. It may be assumed that faculty members who allowed the use of POC evidence-based summaries might endorse these resources with their students. In contrast, a *Google Scholar* search was endorsed by only four faculty (12%) while a majority (52%) indicated they would *never* recommend such a search.

Faculty teaching foundational courses were significantly more likely than those teaching care management courses to recommend the use of a reference librarian for locating information. This difference may be attributed to the curricular design where foundational courses are taken within the first year and then students progress into courses focused within a particular track. By the time the student reaches track focused courses, they may be expected to have developed the skill of retrieval and analysis of evidence-based information. Another possible explanation for this difference is that as the courses become more focused on patient care management, selecting the most appropriate resource for answering clinical questions requires the knowledge and clinical expertise of the faculty member. Therefore, instead of referring students to the librarian, the faculty provide specific guidelines for acceptable and unacceptable resources.

There is a lack of agreement among faculty as to the use of POC evidence-based summaries as reference sources for assignment completion; over half of the faculty permitted their use. This discrepancy may be due to the types of assignments completed in particular courses or faculty may disagree as to the appropriateness of POC evidence summaries for graduate students. The concern is that advanced practice students need to develop more depth of knowledge related to patient care management of particular health conditions before utilizing condensed summaries of the evidence. Not only is solid evidence required for quality patient management decisions, but patient specific factors such as co-morbid health conditions, financial resources, cultural values, and spiritual beliefs must also be taken into consideration before final decisions related to the use of the evidence is made [2]. Additionally, POC summaries may lack discussion related to the pros and cons of various recommendations which require that the user have a significant knowledge base of the phenomenon under concern.

When information is immediately accessible through mobile devices it is easy for students to rely on these POC evidence summaries as the sole source for answers to clinical questions. However, clinical decision-making requires analyzing retrieved information, weighing this information against current practice, and considering the applicability to the individual patient characteristics and demographics. One can compare the dependence on POC evidence summaries to the use of a calculator for drug dosages. Users of calculators put in the numbers, select the type of calculation needed, and trust

the final number. The answer may actually be incorrect due to user error or a failing battery, and without the knowledge of what the *approximate* final calculation should be a fatal error in medication dosage may occur. This over-reliance on POC evidence summaries for clinical decision making may result in errors related to outdated content, failure to consider additional clinical or personal information, or lack of applicability to the specific patient encounter.

In returning to the clinical case study example on identifying the appropriate solution for wound cleansing, the phrase “*What is the appropriate solution for cleansing a laceration?*” was entered into a web-based search engine, *Google Scholar*. Two of the first three links provided evidence-based information that included discussions on the best solutions for laceration cleansing and final recommendations^[3, 16]. The additional link was a protocol for wound cleansing by the University of Ottawa Emergency Services^[17]. Within 30 seconds the correct answer, including a discussion of the topic, was retrieved. This is in contrast to the incorrect answer from *Dynamed* and the lack of an answer after a thirty minute on-line search through a university library. This example is interesting to consider in light of the finding of this pilot study that over half of the faculty participants indicated they would *never* recommend a *Google Scholar* search.

In their investigation of systematic reviews published in the Cochrane Database System and the Journal of the American Medical Association, Gehanno, Rollin, and Darmoni^[18] found *Google Scholar* retrieved 100% of the articles published in these gold standard databases. Study conclusions state that with some additional improvements, *Google Scholar* could become the leading bibliographic database in health care. An additional example of the use of *Google Scholar* as a search engine for rapid answers to clinical questions was the case of an elderly woman who was brought to an urgent care clinic for unilateral upper extremity edema with onset over a three day period. The edema was so significant that a towel was needed to absorb the transudate from the tissues. After a thorough history and physical exam the etiology was still undetermined and an x-ray revealed no probable cause for the swelling. The provider was in the process of sending the patient home with an order for an orthopedic consult when a *Google Scholar* query (i.e., “*causes of unilateral upper extremity edema*”) immediately provided the differential of deep venous thrombosis. An ultrasound revealed evidence of a thrombus formation in the subclavian vein and the patient was admitted to the hospital. More systematic research is needed before formal recommendations can be made, but anecdotal evidence suggests *Google Scholar* provides a user friendly search engine that accesses a wide variety of sources. This does not preclude the students, however, from developing the skills to critically evaluate the source, the quality, the timeliness, and the relevance of retrieved evidence for the clinical question under consideration.

4.1 Limitations

The small sample size from a single online university is a limitation to this study and limits generalizability of findings to faculty at other institutions. The majority of participants were faculty within three advanced practice specialties (i.e., family, nurse midwifery, and women’s health), and thus it is unknown if similar results would be found with faculty in other advanced practice specialties. Although the methods utilized by faculty teaching didactic courses varied for facilitating the access of credible evidence-based sources, the clinical faculty and preceptors may significantly impact the way in which students retrieve and analyze information related to answering patient management questions. Future studies should include didactic and clinical faculty as well as preceptors from a variety of learning platforms and institutions in order to gain a more complete assessment of how advanced practice nursing students are guided in the selection of quality evidence-based practice guidelines.

4.2 Recommendations

Faculty within advanced practice nursing programs should develop a consensus as to the place for POC evidence-based summaries for assignment completion. Processes for accessing the most reliable sources to answer clinical practice questions need to be developed and applied consistently throughout clinical management courses. An emphasis should be placed on validating findings with multiple information sources. Additionally, students should be provided with a list of resources that practicing faculty members consider essential in their practice setting in order to create their own personal library for practice. Specific guidelines as to the types of resources that are acceptable and those that are unacceptable with

rationales should be provided in each course. Creative teaching methods that engage the student in finding accurate answers to simulated patient case scenarios within a specified time frame can begin to prepare the student for quickly accessing accurate, evidence-based care management information. Also the limitations and benefits of evidence-based POC summaries should be discussed with students.

Students must have the ability to frame clinical questions using professional terminology as well as to identify credible, scholarly, professional sources that may be retrieved through a broad based search engine. There is a need for additional research into methods for facilitating student critical thinking in the selection of resources for clinical decision making. Moreover, a critical analysis of information provided by POC evidence summaries should be conducted to evaluate the accuracy and timeliness of information retrieved for clinical decision making.

5 Conclusions

Faculty in advanced nursing practice programs are challenged in providing guidance to graduate students in the appropriate use of a vast array of resources to guide practice decisions. These future health care providers need the skill of locating accurate evidence-based answers to clinical practice questions in a timely manner prior to entering the clinical setting. Although POC evidence based summaries are one tool for accessing evidence-based information, a dependence on these sources as the student's exclusive information source should be discouraged. There is a continued need for faculty to reinforce with advanced practice students that critical analysis of the evidence, and its applicability within the context of the patient, are essential for quality patient care management decisions.

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