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Bench to Bedside: Cultivating Student Champions and Clinician Super-Users of Evidence-Based Practice

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Introduction

The hospital is a setting where innovation is valued and calculated risks are undertaken to push biophysical limits. Substantial biomedical research has occurred of late as researchers relentlessly pursue optimal solutions to complex medical problems. With an ever-increasing percentage of patients surviving critical illness, greater expertise is required by the inter-professional healthcare team to support the fragile physiologic states of patients. The complexity of the practice setting, constant scientific advances, and the occurrence of novel situations that precipitate uncertainty of clinical practice are daily realities that must be recognized and addressed. Healthcare providers are further charged to identify, implement, monitor, and modify strategies to collectively align with the Triple Aim [1] to improve the patient experience, reduce costs, and improve health outcomes.

It therefore has become essential that healthcare professionals possess the knowledge and skills to appropriately analyze the literature and recognize what evidence does exist that might inform current scenarios. To help close gaps existent within the evidence, clinicians should actively participate in the collection of data and in the analysis of outcomes that inform the establishment of best practice guidelines. Fortunately, a greater pool of higher-level evidence has become available to both support best practice and to reduce variability of care. While randomized, double-blind, multicenter trials provide a high level of evidence, such research may not exist to support practice in the acute care and post-surgical environments given the rapid innovations that characterize those settings. However, by performing research of case study design, clinicians fulfill their moral professional obligation to advance societal health by contributing to evidence-based practice (EBP).

Background and Significance

According to Sackett and colleagues [2], EBP includes overt efforts to integrate clinical expertise, patient values, and the best research evidence into the decision-making process for patient care. Weng et al. studied the EBP attitudes and implementation behaviors of physicians, nurses, pharmacists, physical therapists and other health care professionals working in hospitals in Taiwan [3]. These investigators identified physicians and physical therapists to more often alter or confirm their clinical decision-making using standards of evidence than the other observed professionals. Per their investigation, monthly use of reported EBP occurred by 30% of physicians, 22.5% of physical therapists, 10% of pharmacists, and 7.5% of nurses. Despite findings that health professionals generally possess positive attitudes toward EBP [3,4], a clear academic-practice gap has been demonstrated relative to its usage and implementation [5-7].

The internet-based information-seeking behaviors of doctors and nurses were studied by Younger via comprehensive review of the international literature. [8] Findings revealed both professions to utilize online information, especially when pursuing solutions to patient care dilemmas or when continuing their professional development. However, it was demonstrated that when practicing in the medical setting, both groups relied more heavily on collaboration with colleagues to acquire information than on online resources. Eastwood et al. state that "…the process of integrating research into practice is often haphazard and slow." [9] This assessment was confirmed by a current study demonstrating that both experienced and novice health professionals justify decisions more on factors related to clinical experience than on influences reflective of patient values and contemporary research evidence [10]. Overall, findings from the literature highlight inconsistencies in the use of evidence by healthcare providers.

There are many challenges for implementing EBP in the clinical setting [11]. Following an extensive literature review, Schreiber and Stern outlined the frequent challenges and barriers for use of EBP by physical therapists in the United States [12]. These obstacles include: 1) difficulty applying results of randomized controlled trials to unique clinical practice environments, 2) insufficient literature searching and research literacy skills, and 3) logistical hindrances, such as time, productivity standards, and access to electronic resources in the clinical environment. Weng et al. identified similar obstacles, including time constraints and under-developed clinician skill relative to literature searching and critical appraisal. [3] Likewise, in a survey of social workers in the United Kingdom, 80% of respondents identified lack of time and/or limited resources as primary barriers to implementing EBP in clinical practice [13]. Aside from personnel skill, a paucity of library resources or lack of administrative support for EBP may also hinder usage [3,14]. Not surprising, electronic journal access and medical librarian services within large academic medical centers were noted to facilitate exploration of the evidence more so than medical facilities lacking such resources [14]. Given such obstacles, it stands to reason that many clinicians of today would find it daunting to access, navigate, and integrate data from multiple sources into their established clinical routines. This premise is consistent with findings of the Morego study wherein 71% of surveyed health professionals reported lack of training as a barrier for embracing EBP [13]. It is therefore critical that solutions be identified that allow students and practicing clinicians to incorporate EBP knowledge into the decision-making process within all healthcare settings. However, little guidance exists on how such transfer might best be facilitated to promote consistent integration into daily clinical practice routines.

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The Diffusion of Innovation Theory provides insight into how practice behaviors evolve [15]. This theory provides understanding of the process, or steps, required of clinicians to promote sustained modification of practice. Broadly, the steps include: comprehensive orientation, development of insight, acceptance/internalization of the new philosophy or practice, and finally, implementation of change [15]. One method to shepherd novice clinicians along the diffusion continuum to EBP involves the development of champions and super-users [16].

Creating EBP Champions and Super-users

To ensure lifelong utilization and dissemination of best practices by health professions graduates, it is essential that academic programs and care institutions harmoniously reinforce the importance of becoming EBP champions and super-users [17,18].

Champions are key individuals willing to support and implement an innovation [19]. Ploeg et al. surveyed and interviewed champions of EBP in nursing [16]. Qualitative and quantitative findings revealed champions to be capable of influencing best practices through their ability to: 1) disseminate information through mentoring and education, 2) function as persuasive practice leaders within interdisciplinary committees, and 3) tailor implementation strategies to the organizational context. Survey findings also demonstrated nurses to be highly influenced by champions possessing a "good knowledge and/or interest in the subject and (ability) to communicate new guidelines" [16].

Super-users are clinicians who link the world of information technology to authentic patient care environments. Though super-users can be non-health professionals, McNeive determined nurses respond more favorably to instruction provided by a nurse as compared to teaching and support offered by non-nurses [17]. Per McNeive, desirable characteristics of super-users in health care include a willingness to embrace technology, patience, refined communication skills, demonstrated teaching effectiveness, and prior functioning as a champion.

Role of Health Professional Academic Programs

It is the expectation that future health professionals be prepared to critically analyze existing literature and apply such findings to their clinical decisions. Incorporating evidence-based instruction into the academic preparation of tomorrow's healthcare providers will enable the healthcare industry to move one step closer to this outcome. The "academy," learned scholars within institutions of higher education who serve as authorities and drivers of excellence in practice, must therefore commit to fostering an expanded community of learners. To this end, efforts should be directed toward developing students ready for practice and clinicians who continue to learn through practice. Learning activities that foster the discovery and use of evidence can be incorporated into professional curricula by academic faculty so students develop the skills necessary to champion the evidence and best answer clinical questions given uncertain conditions. Such instruction may take many different forms. Cultivation of clinician super-users of evidence, however, may best occur via the development of academic-clinical partnerships [20].

The literature clearly demonstrates multiple benefits derived from network cultivation, namely improved safety outcomes [21], enhanced collaborative patient-centered care [22,23], and heightened compliance with Triple Aim initiatives of healthcare reform [24-26]. While Nabavi and colleagues report partnerships as being able to provide the collaboration and joint practice necessary to achieve mutually beneficial outcomes [27], Teel and colleagues note support, flexibility, and open communication to be necessary and essential elements [28]. It is therefore incumbent upon academic institutions and health facilities to develop infrastructures that value and support such collaboration. When the academy purposefully invests time and resources in retooling current healthcare providers with the strategies and confidence necessary to translate evidence into practice, the end societal outcome is undoubtedly large. It would be much too narrow to consider the patient as the only beneficiary of such efforts. Rather, cultivation of evidence-informed clinicians develops a larger pool of higher caliber professionals to serve as role models and mentors to students.

To promote the skills necessary to champion EBP, Stern and Bridges advocate for the inclusion of leadership training and inter-professional education within the curriculum of all health professionals [29,30]. Jack et al. described a partnership-based initiative between an academic institution and local hospital [20]. Through joint investment and effort, a nursing course was developed wherein students created a best practice guideline that addressed an existing hospital need, devised solutions to overcome potential barriers, and disseminated educational material in a manner deemed most advantageous. Specific to gerontological practice, Schoenfelder had students create and practice championing user-friendly EBP 'tip' sheets for their unique setting [11]. By working directly within authentic healthcare facilities, students were able to grow as leaders and simultaneously introduce evidence to practicing clinicians in a meaningful fashion.

Eastwood et al. highlighted the necessity of selecting the "right integration of research into practice strategy" based upon the specific clinical setting [9]. This statement reinforces the need to analyze the clinical environment, resources, time requirements, and training preferences of various health professionals when developing clinicians who value and practice the best evidence of the field [7]. Creation of user-friendly and easily translatable EBP guidelines, as well as cultivation of champions, super-users, and supportive organizational structures, are approaches that may optimize such success [12,13,17].

Killeen and Barnfather extensively discussed the topic of the academic-practice gap [31]. They stated, "idealistic students may become disillusioned if they are led to believe that they are expected to bring about research-based practice without providing them with the necessary tools" [31]. While many health professions educational programs include training in EBP, it is frequently isolated from the clinical environment in which it must be implemented and utilized [32]. A more prepared future clinician, however, may be cultivated if the EBP component of academic curricula utilize precepts of the Diffusion of Innovation Theory while simultaneously developing student dissemination and professional presentation skills [31].

Billings and Kowalski support a clinical case study presentation model as a means of promoting academic-clinic EBP transfer [33]. These strategies are consistent with an emerging democratic, participatory philosophy wherein students function as agents of change within health professions [34,35].

Purpose

The purpose of this manuscript is to present a case study model for the development of health professions students as EBP champions and for the creation of clinician super-users through the establishment of meaningful academic-clinical partnerships. The models that

will be presented have been utilized in the academic preparation of student physical therapists at two different universities [36]. While implementation of the above models occurred in physical therapist professional curricula, the underlying rationale and activities can serve as a framework for improving the expansion of evidence-based practitioners for nursing and other health professions as well.

Curricular Models to Develop EBP Champions and Super-Users

Program I

In one academic program, the EBP theme was introduced within basic science and research courses and then applied throughout all clinical courses. EBP seminars occurred with consistency throughout the clinical courses and were supported by faculty facilitators who guided students through critical appraisal of various research designs. Didactic EBP preparations culminated in student development of a formal case report during the clinical internship phase of the curriculum. The case report project required identification of an authentic clinical scenario along with demonstration of how existing evidence influenced the clinical encounter and the decision-making process. This experiential model allowed students to develop an evidence-based question, perform a comprehensive literature search, implement an intervention in a methodological fashion, analyze the results, derive an appropriate conclusion, and share their findings with the team.

Both clinical and academic faculty mentors supported student efforts during this project. Clinical instructors assisted with patient identification, collection of relevant data, and supervision of patient care. Academic faculty, on the other hand, offered clinical and EBP expertise, as well as guidance on writing and presentation skills. Tech-savvy students with database searching experience often functioned as super-users and change agents in the student-clinician dyad relationship, while clinicians complemented evidence findings with valued insight from their years of clinical experience [34,35] An EBP resource library with exemplar case studies was available to both students and clinicians via an online course management platform. This repository included an EBP tutorial as well as electronic resources for conducting literature searches and referencing formats. All students prepared their case report in Microsoft PowerPoint© format to facilitate a clear, organized, and succinct presentation. In many situations, the case report was also delivered orally to clinical mentors and staff. Exceptional abstracts representing these case reports were disseminated at peer-reviewed professional conferences.

This model not only introduced evidence into clinical practice and culminated in an EBP product worthy of dissemination, but also provided both student and clinician the skills required to identify and incorporate best practice guidelines into future practice.

Program II

In a different academic curriculum, students participated in four semester-long rounds courses wherein case studies were presented to demonstrate how best evidence informed expert clinician decision-making. Through use of audience response technologies during all case study presentations, opportunities for self-actualization of competency standards were made available to students in serial fashion. Data from student responses was used as a curricular outcome assessment. These responses not only provided insight into each student's trajectory within the domain of problem-solving, but also identified those concepts insufficiently internalized by students and in need of further review and reinforcement. Under the direction of academicians holding content expertise in a particular area or practice setting, practicing clinicians were mentored on case-study design and presentation to enable a high-quality, evidence-based case study that could be widely disseminated. Clinician partnership with invested academic faculty engendered the confidence and motivation needed to engage in future EBP projects. Students benefitted not only as the recipients of these polished EBP case study presentations, but also through their observations of model clinicians who embraced mentorship, valued development, and displayed commitment to lifelong learning.

Aside from the rounds course, EBP also translated to a practice expectation for students completing integrated clinical experiences within two departmentally-operated full-service clinics. Under the direction of board-certified clinical faculty specialists, students in these clinics participated in the delivery of care to the highest standards of excellence as informed through current evidence. By engaging alongside EBP clinician champions, students personally experienced the intersection and triangulation of information as it flowed between the research laboratories, the academic classroom, and the clinical practice setting. Through these clinical opportunities, students developed the skills and confidence needed to advocate for an EBP approach within outside facilities and offer guidance on mechanisms to practice to these heightened standards in both a profitable and efficient manner. In this particular academic program, no explicit curricular requirement existed for students to personally conduct an EBP case-study project.

Outcomes

These ongoing educational endeavors had many positive outcomes. These include, but are not limited to, enhanced student and clinician engagement in case-study research and increased scholarly dissemination in clinical and professional venues. As illustrated in Box 1, dissemination at peer- reviewed venues was fruitful and brought significant recognition to the universities and clinical partners. Aside from these benefits, the project proved advantageous to other stakeholders as well. For example, several clinical sites contacted the programs requesting partnerships for the express purpose of providing additional educational venues for their practicing clinicians to develop EBP and scholarly presentation skills. Despite the time-consuming nature of this undertaking, academic faculty found the opportunity

- Implementation of Evidence-Based Interventions to Promote Development and Organization in the Neonatal Intensive Care Unit
- The Impact on Functional Mobility and Quality of Life During End-of-Life Care for a Patient With Oropharyngeal Carcinoma
- Use of Behavioral Modification, Pelvic Floor Exercise, and EMG Biofeedback for a Patient with Spinal Cord Injury-Induced Urinary Incontinence
- Ascertaining the Effectiveness and Safety of Low-Frequency Ultrasound in an Acute, Post- Surgical Wound with Exposed Hardware
- Early Initiation of Neuromuscular Electrical Stimulation Following Total Knee Arthroplasty: Evidence to Maximize Function
- Passive Movements and Early Mobilization in the Intensive Care Unit
- A Critical Analysis of Existing Evidence on the Management of a Wound with Malignant Desmoplastic Melanoma and Neurofibromatosis
- Are Pulmonary Rehabilitation Interventions Effective in Improving Dyspnea and Activity Capacity in a Hospitalized Patient with COPD Exacerbation?
- A Comprehensive Physical Therapy Approach for a Premature Infant in the Neonatal Intensive Care Unit (NICU): Aligning with the Evidence
- Physical Therapy Outcomes Following Total Knee Arthroplasty Using a Minimally-Invasive Midvastus Approach
- Lower Extremity Functional Rehabilitation Following Cervical Decompression

Box 1: Examples of academic – clinical collaboration case study topics presented in peer-reviewed venues from 2010 – 2015.

to mentor novice scholars with their professional development to be both fulfilling and rewarding. Finally, faculty were able to utilize these case study projects as a means of remaining connected to contemporary clinical practice while simultaneously increasing their scholarly portfolio.

Discussion

Given the many uncertainties of contemporary practice, graduates of health professions programs must be confident in their EBP knowledge and skills if assuming the role of catalyst to bridge the academic - clinical divide. Developing students as change-agents helps resolve the mismatch of philosophies undertaken and practiced within the classroom and clinic given an insufficient cadre of evidence-informed clinicians to model and encourage translation of best practice in the clinical setting. As such, the academy has an obligation to assist the broad community of learners acquire the skills needed for smooth and natural transfer of evidence into patient care environments to support clinical decision-making. Teaching EBP skills is necessary, though not sufficient, to create EBP champions. Without dissemination of findings to stakeholders ranging from clinical colleagues to regulatory agencies to consumers, collective efforts directed toward accomplishing Triple Aim initiatives may de-escalate.

At this time, it remains unclear if these EBP projects promoted a long-term change in practice mentality amongst the majority of new clinician graduates. To maximize the likelihood of their sustained use of EBP, barriers must be minimized and opportunities made available to encourage functioning as champions or super-users. The time and expense needed for some organizations to promote a culture wherein EBP is embraced should not overshadow the healthcare value brought about through reduced variability of practice and consistent utilization of evidence-supported standards of practice. It therefore is incumbent upon academic institutions to support clinicians in gaining proficiency in framing a clinical question, appraising the existing literature, and appropriately integrating findings into presenting clinical scenarios. While dissemination of case-study outcomes is often overlooked, it is a highly critical component of the process. Dissemination not only informs the clinical practice behaviors of others, but also provides the start of case-series research that can further advance the scientific foundations of the health professions. It is only when clinicians possess the skills needed to meet the expectations of evidence-supported care will its value be well appreciated and create widespread transformative change.

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