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Pre-Certification Interprofessional Education: Ideal vs. Reality Patient Safety Curriculum

Edward E. Ward

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Pre-Certification Interprofessional Education: Ideal vs. Reality
Patient Safety Curriculum

Submitted to George Fox University School of Business

In partial fulfillment of the requirements for the degree of
Doctor of Business Administration

Edward E. Ward, July 31, 2017

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY



GEORGE FOX
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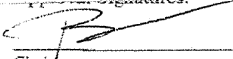
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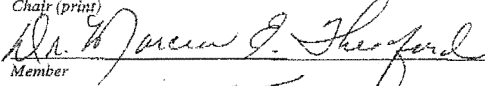
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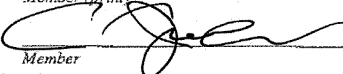
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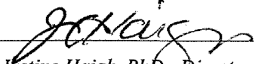
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Abstract

Watershed events at the turn of the millennium brought international attention to profound breaches in patient safety due to medical error, prompting an outcry for a collaborative focus on medical education to eliminate similar future events. Researchers suggested almost two decades ago that exposure to teachings on medical error prevention and patient safety should happen early in student training, not merely in post-certification coursework. Nevertheless, medical errors continue to increase. This study investigates the priority given to error prevention and patient safety in current interprofessional education (IPE) curricula of pre-certified learners. This qualitative investigation was sequential in two phases. Phase one consisted of content analysis of a keyword search on IPE curricula of eleven medical teaching institutions (2005-2015) to determine the frequency of IPE-associated terminology/variables. Analysis of the findings shows how infrequently IPE curricula expose pre-licensed students to concepts of patient safety. Patient safety appeared on 2.60% of IPE websites communications and 4.30% of the time was embedded within the concept of teamwork. Phase two of this qualitative investigation included interviews with six IPE practitioners regarding their perspectives on pre-certification education, patient safety, and medical error prevention. Through guided interviews, phase two exposed the perspectives of IPE pre-certification professionals regarding patient safety curricula. The participants revealed uncertainty regarding time allocated to teach patient safety, the resources available to teach patient safety, patient safety embedded in other courses, and that there were no existing barriers to teaching patient safety. The research revealed that the importance of patient safety and medical

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error prevention was less than the importance of other topics during pre-certification medical training.

Keywords: Interprofessional education, IPE intervention, common curriculum, collaboration, interprofessional team, patient safety, prevention of medical errors.

Chapter One: Introduction

“First, do no harm” (Institute of Medicine (IOM), 1999, p. 3). This is one of the principal tenets of all health care professions. It is a fundamental principle throughout the world of medicine. Patient safety is of major concern to health professionals within the United States of America (IOM, 2001; Sandars, Bax, Mayer, Wass, & Vickers, 2007). Medical errors are the third leading cause of death in the United States, preceded only by heart disease and cancer with a national cost estimate of \$29 billion, half of it passed on to the American health care system (IOM, 2003; Sherwood & Zomorodi, 2014). Healthcare organizations take appropriate steps to increase patient safety and reduce hospital errors. Medical errors are any errors that result in harm to the patient, adverse events, or errors that may fail to do harm to the patient, known as “near misses” (IOM, 2001, p. 28). Teaching error prevention and patient safety should happen early in graduate-student training, yet thousands of medical errors and related deaths occur every year. “To err is human” (IOM, 2001; Pope, 1711 Part II, p. 274-275). However, an expert panel report by the National Patient Safety Foundation (2015) described evidence of the deteriorating state of patient safety and medical error prevention.

Levinson (2010) explained patient safety breaches and medical errors by stating that increases in preventable errors result in direct costs to Medicare. Levinson’s report suggested that during a month-long study, 134,000 Medicare beneficiaries experienced at least one adverse event. Of these 134,000 beneficiaries, adverse events resulted in the deaths of 1.5% or 15,000 people. Adverse events cost Medicare \$4.4 billion in the 2009 fiscal year (Levinson, 2010). The Institute of Medicine (IOM) (2003)

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suggested that design curriculum mitigates medical errors. Shared learning experiences amongst diverse medical disciplines could result in better interprofessional communication, collaboration, and improved patient outcomes. The present research explored whether emphasis on patient safety and medical error prevention exists in medical schools with IPE pre-certification programs.

Problem Statement

IPE promotes early interdisciplinary training in patient safety and medical error prevention for all pre-certified health care learners (DesHarnais & Nash, 2011; Hayashi et al., 2012). A discrepancy exists between this ideal view and the current reality of IPE curriculum (Barr, Koppel, Reeves, Hammick, & Freeth, 2005). Reports on patient safety and medical errors exposed a need for change in medical systems and patient care, but breaches in patient safety and medical errors continue. IPE efforts primarily direct post-certification education with little concern for pre-certification training. The present research explored the significance of medical students' exposure to patient safety and medical error prevention education (in IPE) at the pre-certification level on continued medical provider errors, patient safety breaches, and poor patient outcomes (IOM, 2000; Levinson, 2010; Sandars et al., 2007). The research questions are: is patient safety and medical error prevention important to pre-certification IPE curriculum (RQ1); is patient safety and medical error prevention embedded during pre-certification IPE (RQ2)?

Statement of Purpose

The present research included data from websites of eleven medical schools regarding the importance of patient safety and medical error prevention to pre-certification IPE curriculum. The goal of this research was to determine if patient safety

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and medical error prevention are important to pre-certification IPE curriculum (RQ1) and if patient safety and medical error prevention are embedded during pre-certification IPE (RQ2). This research was not a critique of IPE, but an examination of the significance of patient safety and medical error education at the pre-certification level as reflected in IPE performance at the practice level.

Background

In a landmark report, the Interprofessional Education Collaborative Expert Panel (IECEP) cited “five core competencies” in cross-professional collaborative practice designated by a 2003 IOM report as “foundational principles” in the education of health professionals (IECEP, 2011, p. 1). One of the five competencies required that all health care students learn to identify the root causes of medical errors, report and prevent errors, and investigate breaches in patient safety (Block, 2014; Brilli, Allen, & Davis, 2014; IOM, 2003; Nicolini, Waring, & Mengis, 2011; Norris, 2009).

Any slight in providers’ education at the pre-certification level may influence the delivery of high quality patient care. Hospital-caused deaths and accidents occur, such as *Boston Globe* reporter Betsy Lehman dying from a medical overdose (Crane, 2001), Willie King’s wrong foot amputation (Colleagues Defend Doctor Who Cut, Associated Press, 1995), and a child (Bob Kolb) dying during a routine surgery (IOM, 2001). Often mistakes go unreported. The IOM released the results of the Harvard Medical Practice Study I (Brennan et al., 1991). The study revealed that medical errors accounted for up to 98,000 deaths per year, which greatly surprised many in the health care community and beyond (IOM, 2001).

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To increase patient safety and provide positive hospital outcomes, the role of health professionals and interprofessional groups should be one of advocacy for patient safety and improved quality of care (IOM 2001; Sandars et al., 2007). Graber (2009) considered patient safety an essential part of medical student education. Colleges of medicine, nursing, pharmacy, health care administration, and their related associations should include more instruction on patient safety and its relationship to quality care improvement. One of the challenges in accomplishing this is the pressure on clinical education programs to incorporate a broadening array of topics. Initial exposure to patient safety should occur early in undergraduate and graduate training programs, as well as throughout continuing education (IOM, 2001, p. 146).

IPE professionals advocate for a longitudinal approach to learning patient safety and medical error reduction (Fitzsimmons, Cisneros, & Samore, 2014). Perceiving patient safety mistakes as systemic problems, the 2001 IOM conference emphasized the importance of safety education. As in earlier years, the conference suggested that patients should be safe from negative outcomes and the risk of medical error (IOM, 2001). Later IOM reports indicated continued poor patient outcomes (IOM, 2007). Chinn (2014) suggested that reports, such those from the IOM, highlighted areas in patient care that require action and attention by the medical community.

In 1996, the IOM's Health Care Quality Initiative began as an ongoing effort to assess and improve the quality of patient care. The resultant IOM proposals desired a "threshold improvement" in quality over a ten-year period to reduce adverse patient outcomes by 50% within five years (IOM, 2001, p. xi). Allen (2013) and Homsted (2000)

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supported these ideals. However, James (2013) revealed that 200,000 to 400,000 inadvertent, preventable errors still occur each year.

The need for research on the IPE pre-certification curriculum. Hospital-safety problems and medical errors decrease the number of good health care results for patients (IOM, 2001; Sandars et al., 2007). Educational teamwork can result in positive changes to counteract these outcomes (Collins, 2001; Senge, 1990; Watts, Lindqvist, Pearce, Drachler, & Richardson, 2007; Weller, Barrow, & Gasquoine, 2011). It is unknown, however, whether collaborative IPE teams introduced at pre-certification levels increase positive results for patients or if education of pre-certification student teams could similarly affect the post-certification agenda (Brady, 2011). Important teachings about patient safety and medical error prevention vary in the IPE curricula of beginning health care students.

The purpose of this investigation was to assess the priority given to team-focused medical error prevention, and patient safety in general, in the curriculum of IPE at the earliest stages of a health care student's career. In the future, students could complete assessments to evaluate whether, and to what degree, changes to early programs of study bring better results for patients and other health care participants. Blue, Zoller, Stratton, Elam, and Gilbert (2010) posited that the IPE at the medical school/pre-certification level is unexamined.

Contribution

The contribution of this study to the existing body of research is to determine the priority given to medical error prevention and patient safety in the IPE curriculum of pre-

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certified learners. Assessments could determine whether any changes to early student curriculum produce consistently better patient care and outcomes.

Research Question

Is patient safety and medical error prevention important to pre-certification IPE curriculum? Is patient safety and medical error prevention embedded during pre-certification IPE? Insights gained from answering this question help fill quality-of-care gaps in IPE in dentistry and other medical fields (Rafter & Pesun, 2006).

Methodology

The researcher used a qualitative method of investigation. Content analysis is the methodology for the first phase of this research (Wilkinson & Birmingham, 2003). Content analysis is ideal because of its validity, reliability, and configuration of measurement (Rudestam & Newton, 2007). The pre-certification IPE curricula from between 2005 and 2015 of eleven medical teaching institutions (on-line sources of data) established the boundaries of the research (Riffe, Lacy, & Fico, 1998). Keyword research measured the usage frequency of phrases such as *medical error prevention*, *patient safety*, *interprofessional education*, and *teamwork* in school databases (Grbich, 2013; Krippendorff, 2004; Rudestam & Newton, 2007). Priority keywords were those that appeared most frequently in the purposeful sample (Riffe et al., 1998). The frequency of relevant expressions revealed the rate of exposure of pre-certified students to these important concepts early in interprofessional health care education.

In the second phase, the researcher merged the content analysis data with qualitative research (i.e., data gathered from structured interviews with six IPE practitioners at the pre-certification level). Open-ended interview questions in guided

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interviews with six IPE practitioners evaluated IPE patient safety, teamwork, and other IPE subjects in more depth. The researcher translated and coded interviews to allow for the emergence of themes pertinent to the research questions. This research used Hahn's (2008) Qualitative Research Coding and Analysis technique, Microsoft Excel, and Microsoft Access.

Chapter Two: Literature Review

What is Interprofessional Education?

Barr et al. (2005) provided a working definition of interprofessional education (IPE): the process by which a group of students or workers from health-related occupations with different educational backgrounds learn together during certain periods of their education. Interaction is an important goal. IPE “consists of occasions when two or more professions learn with, from, and about each other to improve collaboration and the quality of care” (Barr et al., 2005, p. 31).

Foundations/ history of IPE. IPE emerged in response to news of domestic and global cases of patient neglect and a preponderance of medical accidents. An alarming number of professional lapses resulted from specialized health care, which developed in response to increased demands for medical care (Barr et al., 2005; Bowie, McKay, & Kelly, 2012; World Health Organization (WHO), 1973, 1978, 1988). The dire need for IPE interventions became abundantly clear. There were misunderstandings about mission objectives, terminology, theory, sustainability, and appropriate nomenclature as IPE continued to evolve. This literature review includes details of the evolution of IPE.

Meads, Ashcroft, Barr, Scott, and Wild (2005) cited early World Health Organization (WHO) reports (1973, 1978) as establishing important groundwork; the seminal report came from a WHO study group meeting in Geneva (WHO, 1988). This meeting unified multiple reports and initiatives in various locations to address interdisciplinary concerns, and strengthened the global foundations of IPE. Barr et al.

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(2005) reported that medical specialization created isolated regions of health care, each with its own knowledge base, agenda, and sets of processes. There was an urgent need to focus on patient care coordination, medical language misunderstandings, and cross-discipline disconnections because of a historical and purposeful lack of communication, a regional or discipline-specific hoarding of knowledge, and many conflicting practices (Barr et al., 2005). The development of IPE curriculum anticipated changing behaviors, surmounting barriers, and bridging communication gaps (Barr et al., 2005; WHO, 1973, 1978, 1988). Rabøl et al. (2011) revealed the major cause of medical errors was communication (52% of all errors). The collaborative nature of IPE addresses the increase in diagnostic complexity and patients' anticipation of better outcomes (Berwick, Nolan, & Whittington, 2008), patient demands that outpace resources, changing patient demographics, and the many ongoing economic and political reformations in health care (Barr et al., 2005; Meads et al., 2005).

What are the aims? Patient safety breaches are multifactorial, and IPE focuses on two predominant, overarching issues: supporting the health and well-being of practitioners and the improvement of patient care. The philosophies and practices of IPE yield a compelling argument for high-quality patient-centered care, and reveal a discrepancy between the ideal model of IPE effectiveness and its real-world outcomes as revealed by increased litigation (Dalton, Samaropoulos, & Dalton, 2008) and medical care uncertainty (Newbold & Hyrkas, 2010). This literature review provides a scholarly foundation for determining the priority given to patient safety and medical error prevention in the IPE curricula of pre-professional health care students.

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Where is the gap? The gap between the ideals of adult-learning theory and what takes place during organizationally lead IPE interventions lies in curricular design (Knowles, Holton, & Swanson, 2005; Wlodkowski, 2008). In evaluations of IPE at the pre-certification level, investigators reported an emphasis on cross-discipline education that rarely resulted in documented improved patient care outcomes or improved patient safety and error prevention in the long term (Thistlethwaite, Kumar, Moran, Saunders, & Carr, 2015). Forty years of IPE research failed to show long term positive changes influencing healthcare outcomes, experiences, and costs (Brandt, Lutfiyya, King, & Chioreso, 2014).

Literature on medical error prevention and patient safety is scarce in pre-certification IPE curricula compared to what is available in post-certification programs (Barr et al., 2005; Blue et al., 2010). The material reviewed in this chapter ranges from a seminal 1988 WHO study on multi-professional education for health personnel to an exploration of pre-qualification IPE evaluations by Thistlethwaite et al. (2015).

Perspectives

How to bridge the gap between education and research. The current research included exploration of IPE curricula from the following perspectives: the practice level, the foundations of IPE, the educational curriculum, the interpersonal conduit, curriculum content and design, learner readiness, Schein's cultural island (Schein, 2010, 2013), evaluations and outcomes, the team construct, collaboration, group behavior, the future, the adult learner, collaborative learning, and acceptance and embeddedness. These areas of exploration provide content of IPE in the present literature, and help clarify the idea

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that pre-certification IPE curriculum may be the most effective way to focus on medical error prevention and hospital safety.

What happened? The IOM publication of *To Err Is Human: Building a Safer Health System* (IOM, 1999) was a turning point in IPE and health care in general (Kohn et al., 2000). Ulrich and Kear (2014) expressed that *To Err is Human* was the turning point of the patient safety movement that brought sudden, worldwide attention to the enormous number of hospital errors that happened yearly in the United States and their catastrophic effects on patient safety. Despite more than 15 years of idealistic attempts to improve IPE at the precertification level, the number of annual deaths caused by medical errors in the U.S. at the turn of the millennium was approximately 98,000 (Brennan et al., 1991; IOM, 2001). According to the National Patient Safety Foundation (2015) and Levinson (2010), poor quality patient care continues.

Another watershed moment in health care was the global publication of two public inquiries into breaches in patient safety in the United Kingdom in the early 2000s. One case reported on many infant deaths from open-heart surgery at the Bristol Royal Infirmary between 1984 and 1995 (Department of Health, 2001). The Victoria Climbié investigation was the other case. It centered on a little girl who died a terrible death attributed to caregiver abuse and the ongoing neglect of British medicine and social services (Laming, 2003). In both cases, lack of cross-professional education, interaction, and teamwork contributed to the deaths. Both cases emphasized the urgent need for collaborative, in-practice efforts of IPE to address medical errors and their effects on communities and health care. Ruch (2007) and Ferguson (2005) contended that Victoria

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Climbie's treatment and lack of care mirrored the treatment and care given to health professionals by hospital management.

Where does it happen? Few early reports acknowledged the crisis in patient safety in the U.S., Britain, and elsewhere. A WHO (1988) investigative group suggested that rampant medical mistakes were the result of increased medical specialization and poor communication among medical providers. Earlier WHO investigations reported similar findings (WHO, 1973, 1978). Data culled in 1984 by the IOM supplied the results of the Harvard Medical Practice Study I, the appalling 98,000-per-year mortality rate (Brennan et al., 1991; IOM, 2001).

To Err Is Human (IOM, 1999) and the reports of the two British pediatric disasters harnessed the attention of health care patients, providers, and investors around the globe. These reports had profound implications for the future of IPE in practice. The thrust of *To Err Is Human* (IOM, 1999; Kohn et al., 2000) is that the breakdown in patient safety is not simply the result of individuals making mistakes. Mistakes are the result of a complex, multi-component accumulation of errors and neglect in the health care system that failed to keep patients safe from harm (Kohn et al., 2000). The evidence of a collapse in teamwork and collaboration was the cause of many errors and accidents. The report declared an urgent need for interdisciplinary research and education specifically geared toward improving the safety of patients (Kohn et al., 2000).

The British investigations. As reported in the Department of Health (2001) public inquiry, one in three children undergoing open-heart surgery at the Bristol Royal Infirmary between 1984 and 1995 was either injured or died. Meads et al. (2005) stated that a lack of multidisciplinary teams and clinical leadership contributed to this calamity.

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Meads et al. (2005) cited precursors to systemic breakdowns including an absence of transparency, the disempowerment of junior doctors, the lack of a process to question authority, the existence of a private-club culture, and the lack of an external audit.

Contributors to further systemic breakdowns included surgeons perceived as heroes, settling for mediocrity instead of reaching for excellence, and the long-term systemic subordination of pediatric care to other departments of the hospital. Kewell (2006) suggested the focus of the Bristol Royal Infirmary, at the time, was more toward management and marketization than patient care.

Laming (2003), former chief inspector of the British Social Services Inspectorate, reported on the inquiry into the death of Victoria Climbié in London. The little girl's initial contact with the service community was April 1999 when she was seven and a half years old (Laming, 2003). Her aunt, pretending to be her mother, brought her in for care. A series of potential interventions occurred: six times in public care and twelve times with social-service personnel, any one of which might have saved the child's life. After undergoing terrible physical and emotional abuse over a considerable period, investigators found Victoria in February 2000 wrapped in a garbage bag in a bathtub. She died days later. An autopsy revealed 128 physical injuries (Laming, 2003). Contributing factors to her death included a lack of interprofessional/interagency collaboration, dysfunctional environments, inadequate resources, poor record keeping, misdiagnosis of problems, an absence of follow-up, and many opportunities for errors during shift changes (Meads et al., 2005). Ferguson (2005) and Ruch (2007) suggested her death related to the inward focus of the health professionals charged with her care.

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What are other theoretical causes? *A British theory: Swiss cheese.* Reason (1990, 1997, 2000) suggested the metaphor of Swiss cheese to describe the figurative holes in the quality of patient care including missing quality-control measures, policies, and regulations that appeared beneficial to participants in the system but over time caused negative outcomes. The British health care system caused many accidents. All it took for one to occur was the right combination of mistake-inducing conditions (Reason 1990, 1997, 2000). According to Peltomaa (2012), the Swiss cheese model was as applicable to quality control in the medical sector as in the aircraft sector. Perneger (2005) reasoned that healthcare professionals associate the Swiss cheese model with patient safety. However, Perneger (2005) found interpretation of the practical application of the model differed among safety professionals.

Situational theory. Vincent, Taylor-Adams, and Stanhope (1998, 2000) focused on situations that were conducive to negative health care experiences across the board. They suggested that apathy toward patients and hospital safety, once universally ingrained in the culture of medicine, produce unfavorable conditions that result in accidents, uncomfortable work environments, and poor team performance. Vincent et al. (1998, 2000) cited evidence of this detachment in the design and policies of written and verbal communications, deficiencies in supervision, and unsatisfactory training in cross-professional competencies. Vincent et al. (2000) considered the psychiatric ramifications of blaming individuals, rather than the organization, for adverse patient outcomes to be damaging and unproductive.

According to Helmreich (2000), team factors that contribute to negative patient outcomes include incomplete communication, a lack of respect among professionals,

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poor planning and preparation, and a failure to complete tasks and treatment. Meads et al. (2005) stated that ineffective IPE collaborative policies diminished quality of patient care through the isolation of team members from each other, disrespect among fellow professionals, failed IPE initiatives, and lack of system-wide processes for self-evaluation. Kohn et al. (2000) suggested the two British reports demonstrated classic examples of the compounding circumstances that led to medical errors and systemic failures that result in poor interprofessional collaboration.

What occurred as a result? Approaches to patient safety problems are multidirectional. After *To Err Is Human* (Kohn et al., 2000), quality control investigative bodies in various countries promoted interprofessional teamwork and patient safety. Great Britain established the National Patient Safety Agency (NPSA). The United States formed the Institute for Healthcare Improvement. The WHO started the World Alliance for Patient Safety (Reeves, Lewin, Espin, & Zwarenstein, 2010, p. 25). The Australia Patient Safety Foundation formed in 1989 to address similar issues. In the United Kingdom, the NPSA began improving the quality of treatment and care. New regulations ensured that patient outcomes remained favorable. Other similar British agencies created new models to review adverse medical outcomes.

IPE theories, practices, and approaches mitigate patient safety problems. Meads et al. (2005) reported that the Climbie and pediatric open-heart cases in Great Britain resulted in positive changes in health care philosophy, practices, and services, including the development and growth of IPE doctrine, the linking of patient outcomes across professions, and a recommendation for the implementation of cross-discipline education early in health care education. IPE interventions addressed troublesome health care issues

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such as the lack of a preventive care orientation, an absence of accountability, and disjointed teamwork. These issues can proactively transform through IPE into equity among professionals, relationship building, the dissolution of such communication barriers as specialist data *silos* (i.e., the hoarding and non-sharing of crucial information), and the end of professional protectionism in general (Meads et al., 2005).

Kohn et al. (2000) suggested that IPE may eventually eradicate knowledge silos that result from gaps in professional training that obstruct collaborative communication and the maintenance of patient safety. In response to the patient safety crisis, and in alignment with IPE philosophy, the IOM (2000) recommended that the curriculum of pre-certified students include collaboration with a diversity of health care professionals on broad subjects that incorporate patient safety and medical error prevention. An IOM (2001) update submitted that medical errors and other breaches in patient safety were systemic in origin and needed reduction. The IOM report (2007) indicated a continuation of poor patient outcomes.

Barr et al. (2005) felt that collaboration was critical at all stages of patient treatment and interaction with health care professionals. Errors and accidents are evidence of collapses in teamwork and collaboration. Failures in collaboration happen because of systemic and cultural breakdowns, and because of professional pressures that result in incomplete communication (Christensen, Levinson, & Dunn, 1992; Rassin, Kanti, & Silner, 2005). Breaches in communication, procedure, and policy can result in the injury or death of patients from medical error (Barr et al., 2005). IPE, with its emphasis on teamwork and collaboration, can improve patient outcomes. Barr et al. (2005) believed that the establishment of a collegial, cross-professional environment that

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focuses on patient safety and medical error prevention would lead to a general decrease in negative results for patients.

Meads et al. (2005) stated that errors reflect a weakness in the system, not in individuals. An error appearing to be the result of a single event was more often the result of compounding multiple factors (Kohn et al., 2000; Meads et al., 2005; Vincent et al., 1998, 2000). Reason (1990, 1997, 2000) stated that IPE focuses on quality of care by examining cultural issues and other possible causes of breaches in patient safety, rather than emphasizing isolated incidents involving blameworthy individuals. Meads et al. (2005) recommended that research focus on “near misses” that occur during treatment, rather than merely on post-mortem investigations of catastrophic events (p. 62).

Recommendations at the pre-certification level. The IOM (2003) recommended that pre-certification IPE curriculum promote the concepts of interdisciplinary values, ethics, roles, responsibilities, and teamwork. The effectiveness of IPE curriculum evaluation is best when programs of study line up with worthy health care initiatives in the community (IOM, 2003). Students’ facility with concepts and practices of IPE was most prominent when learners made decisions about real health care issues in professional practice. The IECEP (2011) linked investigative efforts to five IOM cross-professional “core competencies for all health professionals” considered to be the guiding philosophies of the health care profession and the groundwork for IPE (p. 1).

One of the five core competencies required that student IPE health care curriculum include the investigation of medical errors (identifying, recording, and averting them) and evaluate the breakdown in patient safety in general (IECEP, 2011; IOM, 2003). The IOM (2003) suggested that when students master this crucial

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competency, the benefits will become evident in the professional arena and medical error problems will end. Stone (2010) argued that IPE is necessary for graduates to be fully competent in practice. This real-world, results-oriented approach to health care education ideally diminishes manifestations of poor patient care. However, neither the 2003 IOM report nor the 2011 IECEP report focused any further attention on the teaching of patient safety or medical error prevention to pre-certified health care students.

Manasse (2009) agreed that new educational approaches to patient care should explore novel medical approaches, especially those methods that were sensitive to the well-being of the individual patient while recognizing the diversity of the patient population in general. IPE students learn the importance of teamwork and collaboration to reduce medical accidents (Manasse, 2009). The publication of *To Err Is Human* (Kohn et al., 2000) and the reports of the British pediatric investigations highlighted an urgent need for better, more comprehensive, more collaborative training and education in patient safety. Kohn et al. (2000) suggested IPE could lead to a significant reduction in the rampant medical errors that jeopardized the well-being of patients and the stability of the overall health care system. IPE focuses on cross-discipline education, teams, and collaborative efforts. Disagreement about the best time to introduce IPE to learners for the greatest effect exists (Barr et al., 2005). Were pre-certification or post-certification programs of study better times to learn about patient safety and preventing medical errors? During which period was the learning most sustainable? These are still open questions.

Can IPE fix the problem with education, processes, and research? Curriculum design can change the effectiveness of IPE. Reeves et al. (2010) suggested new models of

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health care education that focused on teamwork and shared-learning activities in the service of quality patient care. The most valuable learning in IPE often happened in informal settings where participants shared their interpretations of a learning event and exchanged earlier paradigms for new thinking (Marris, 1986). Munroe, Kaza, and Howard (2011) suggested that training is objective and organization-value driven, especially when the training is part of cultural change. This type of cognitive learning requires higher brain function, which in turn leads to the creation of new initiatives and change, thereby advancing highly effective IPE. This spontaneous learning during meal conversations, at the water fountain, and during meeting breaks was valuable in IPE collaborations. However, there was no way to measure its effects, particularly because there were no principles or methods to refer to or apply (Barr et al., 2005). According to Wlodkowski (2008), IPE curriculum needs learner endorsement. The intersection of curriculum (structured learning), learner experience, and teaching objectives reveals how learners relate IPE to their worldview and values. Wlodkowski (2008) suggested that this common ground ignites learner motivation.

Education Practice

The ongoing mission of IPE is to improve results for patients while confronting the present-day and future complexities of health care delivery (Barr et al., 2005). The intent of IPE curricula is to change the thinking and actions of IPE learners to benefit patient care, hospital safety, work environments, and teamwork (Barr et al., 2005). Professionals are always under pressure to make thoughtful, high-quality decisions, but “training deficiencies show up as high workload, undue time pressure, inappropriate perception of hazards, or motivational difficulties,” precursors to medical error (Kohn et

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al., 2000, p. 60). To teach medical professionals how to competently support themselves and others in difficult decision-making environments and to increase the effectiveness of the IPE curriculum in general, IPE theorists established the “cascading curriculum” to link different phases of training (Barr et al., 2005, p. 27). Adult learning theory, for example, influences IPE and patient safety.

Adult learning theory. IPE curriculum design, content, and delivery must coincide with predictable adult learning theories to be successful, meaningful, and sustainable. According to Knowles (1975), adult-education theory provided motivation for a learner to conceptualize a problem and then solve it. Adult learners want to solve problems in ways that are practical, related to their work, and useful in their everyday lives (Goffman, 1963). Autonomous learners draw on their own experiences to solve problems (Brookfield, 1986; Knowles, 1975; Kolb, 1984; Lave & Wenger, 1991). Adult learners recognized what made problems unique by comparing them to something they already knew, analyzing from their own perspectives, and researching plausible solutions. The problem-based learning of IPE provided an ideal forum for adult learners to evaluate and share their collective wisdom (Barr et al., 2005). Agreeing with the idea that the IPE curricula should provide in-action, experiential learning, Kolb (1984) described the process of adult learning as a process of first thinking about the nature of a problem by conceptualizing it, then comparing the problem to what is already known and felt by the learner. The learner constructs a theory about the problem and attempts to prove or disprove the theory by applying solutions to the issue at hand (Kolb, 1984).

Whole-part-whole theory. The whole-part-whole theory propounded by Knowles et al. (2005) serves as a background for IPE improvement and invention.

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According to this idea, teachers introduce a new concept intact to the learner's consciousness, followed by an exploration of its component parts (the required knowledge, expertise, and activities involved in the topic) after which the learner returns to the concept (or new whole) that helped place their new knowledge in context. "The whole-part-whole learning experience provides the learner with the complete understanding of the content at various levels of performance, and even allows for higher-order cognitive development to the levels of improvement and invention" (Knowles et al., 2005, p. 241).

Knowles et al. (2005) stated that the first whole in the equation evoked motivation in the learner by supplying the meaning and relevance of the subject matter and a general sense of connection to the new knowledge. This new knowledge fades from memory, however, unless an exploration occurs of its component parts through such actions as role-playing, practicing, or simulation. This allows for the successful transfer, acceptance, and embedding of the new knowledge in the learner's academic life, constituting the second whole. This explains the position of Barr et al. (2005) that received or *didactic* learning was of little importance to IPE (Knowles et al., 2005).

Learning methods and their prevalence in IPE. According to Barr et al. (2005), student acceptance of IPE hinges on curricular design, content, and delivery. These factors are critically important to the success and effectiveness of IPE interventions. The learning methods used in IPE interventions contribute significantly to curricular design. The analysis by Barr et al. (2005) of 107 independent evaluations of IPE interventions revealed the frequency of various learning methods within them. Totals were greater than 100% because of varied research approaches (see Table 1).

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Table 1

Frequency of Learning Method Keywords in IPE Intervention Curricula

| Learning methods | Frequency of appearance |
|-----------------------|-------------------------|
| Exchanged | 56 studies (52%) |
| Received | 42 studies (39%) |
| Guideline development | 38 studies (35%) |
| Practice-based | 21 studies (20%) |
| Problem-focused | 15 studies (14%) |
| Simulations | 9 studies (8%) |
| Observations | 7 studies (7%) |
| E-learning | 1 study (1%) |
| Not given | 5 studies (5%) |

Note: Adapted from *Effective Interprofessional Education: Argument, Assumption and Evidence* by Barr et al. (2005).

According to Barr et al. (2005), exchanged learning (i.e., post-certification participants sharing their points of view, emotions, and experiences as practicing medical professionals) appeared in 52% of the interventions. This method involved games, values/ethics discussions, and the exploration of mental models, organizational learning, and systems thinking (Argyris & Schon, 1978; Senge, 1990). Learners from various disciplines exposed the differences in their values through a common desire to form

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better working relationships. The goal was to gain insight into the commonalities and idiosyncrasies of distinct professional practices and foster a climate of collaboration.

Received (didactic) learning, referred to in 39% of the studies reviewed, had no importance in the IPE curriculum because it was exclusively instructor-led and therefore in opposition to IPE philosophy (Barr et al., 2005). It failed to follow the guidelines of adult education or meet the requirements of IPE. Assessments of IPE course design and recommendations for improvement often followed successful interventions. These inquiries constituted a learning method with guidelines for the continuous system-wide development and improvement of health care protocols and professional behavior, specifically in the implementation of an IPE patient safety curriculum (Bonomi, Wagner, Glasgow, & Von Korff, 2002). By using outside training agents, this guideline development learning method aligned with theories of total quality management (TQM) and continuous quality improvement (CQI) posited by Oakland (1993) and Bonomi et al. (2002). It ensured a high level of professional practice and patient care. The method appeared in 22 (20%) of the 107 evaluations as Level 4 changes in behavior and organizational practices, in 13 studies (12%) as changes in the delivery of services and benefits to patients, and in 38 studies (35%) that represented course-design recommendations and requirements (Bonomi et al., 2002; Oakland, 1993).

Barr et al. (2005) revealed that the use of various combinations of interactive learning methods provided the best educational results. The problem-focused learning method (15 studies, 14%), for example, often included seminar discussions and role-playing of exchanged learning and/or the lectures of received learning. The practice-based method (20% of studies), the problem-focused method (14%), and simulations

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(8%) were rare in IPE research as individual methods of teaching/learning. However, when used in combination with other methods as part of a curricular design, the synergistic effects of the learning aligned with the IPE vision (Barr et al., 2005).

Arguably, received learning or didactic teaching has no place in IPE. By definition, such [interpersonal] education employs interactive learning methods...Received learning, nevertheless, still has a place, used sparingly, for example to respond to informational needs by way of background, or to questions arising from interactive learning. (Barr et al., 2005, p. 102)

Wlodkowski (2008) stated that the information learners gained in a classroom was of little value when decisions needed immediacy because these urgent decisions were course-corrected. Wlodkowski (2008) discounted knowledge gained from a book or lecture alone as a suitable method on which to base impromptu decisions because it lacked the support of learners who could not envision themselves as personally involved in the absence of relevant mental models. Wlodkowski (2008) preferred adaptive decision-making so that learners gain knowledge “by doing” (p. 292).

Goldberg (2001) suggested that learners rehearse individually and in teams to fully absorb new knowledge and practice to make better decisions, take appropriate actions, and create new mental models while in a moment-to-moment, course-correction mode. Vaughan (2006) reported that IPE curriculum models must provide the learner with opportunities to practice adaptive decision-making, and that cause-and-effect simulations played a vital role in this situational-learning process. Caine and Caine (2006) explained that repeated IPE actions and thoughts embed in the senses, intuitions, feelings, and physical being of the learner.

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According to Argyris and Schon (1978) and Wlodkowski (2008), learners require repeated opportunities to immerse themselves in real-life situations to translate new knowledge into practice and engender adaptive decision-making. Real-world circumstances engage students' emotional and physical lives, motor learning (muscle memory), and neurological systems as they receive feedback from fellow collaborative learners. Wlodkowski (2008) suggested internships, role-playing, and simulations as ideal modes for adult education, especially when "practicing collaboration" (p. 298).

Adult learner motivation. In practice, adult learners self-monitor their patient safety behaviors. Wlodkowski (2008) suggested there was an intrinsic motivation in all individuals, regardless of their education or social development, to be competent in matters they interpreted as significant. Learning does not occur without motivation. Successful achievements in IPE prompt reflection by a learner on the causes of that success, and enhance self-efficacy and motivation by amplifying feelings of being capable, tenacious, and knowledgeable. When similar tasks present themselves, the learner recognizes the opportunity and feels confident and capable. The motivation to modify attitudes and change behaviors increases (Csikszentmihalyi & Csikszentmihalyi, 1988).

Theories on the lack of adult-learner motivation. Adult education theories explain the low levels of attitude and behavioral changes in professional practice that surfaced in Barr's typology (Barr et al., 2005). According to Barr et al. (2005), the attitude of the IPE presenter (an organization, instructor, or evaluator) greatly influences the motivation of learners, how receptive they are to the environment, and how they approach IPE. Negative behavior is the response to domination and threats of

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punishment. Learners made rapid judgments about instructors, fellow participants, delivery, subject matter, grading, and facilities. Students who failed to respond to extrinsic “carrot-and-stick motivation” may be less motivated in IPE (Wlodkowski, 2008, p. 45). This type of criticism was a violation of Thorndike’s “connectionism” theory of trial-and-error learning (Knowles et al., 2005, p. 25). It defied the adult-learning theories of learner readiness in which actions are intrinsically purposeful and have significant consequences.

According to Peters and Waterman (2006), a learner’s desire for self-determination flowed from an “illusion of control” (p. 80). In simulations of an IPE work environment, professionals engage in a shared learning environment (Strauss, 1978) where they negotiate power and roles such as those observed between nurse and doctor in patient care situations (Svensson, 1996). As learners gain a sense of control through self-rewarding outcomes, they commit passionately to producing more of them. The poor outcomes of Level 3 behavioral change evaluations demonstrated uncertainty about goals, a loss of control, the presence of organizational domination, and a breakdown in collaborative learning (Wlodkowski, 2008).

Is curriculum design the answer? The cascading curriculum is a succession of stages in an educational process, each of which prompt the next logical step in the process. This logical sequencing of IPE training events maximizes the effectiveness of a curriculum. Barr et al. (2005) stated that effective IPE influenced patient care through learner dissemination of IPE ideas, thoughts, and actions into every corner of a health care organization. Carpenter and Dickson (2008) compared a cascading curriculum to a chain reaction influencing students, organizations, and patients.

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In IPE literature, the cascading curriculum portrays ideal events. Various connections involved in team formation lead to elevated performance through open interpretation. Baggs and Ryan (1990), Baggs et al. (1997), and Borrill et al. (2001) argued that the cascading IPE curriculum tends to view collaborative teamwork as the key to increased IPE effectiveness, increased job satisfaction, and reduced occupational stress and employee turnover. There was no conclusive information about the experiences or results for patients.

Barr et al. (2005) and Reeves (2005) opined that IPE curricula are subordinate to more traditional modes of teamwork education. IPE works independently within and outside of conventional settings. Failing to designate either patient safety or error reduction as important elements, Barr et al. (2005) mentioned improved patient care in the cascading curricula of effective IPE. Kohn et al. (2000) felt that IPE and its curriculum were the key to medical error prevention and the maintenance of patient safety, which in turn influence stakeholder learning, patient satisfaction, and the financial sustainability of organizational medical care. The benefits gained from a properly implemented IPE approach to medical error prevention and patient safety far outweighed the monstrous cost, both financial and human, of doing nothing. Drucker (2001) argued that health care organizations focus on producing healthy patients and function within a specific cost structure. Hospital budgets often associate quality of patient care with costs (Levinson, 2010).

IPE stakeholders view the problem from all directions. IPE curriculum must overcome gaps in communication that result from the proliferation of specialized health care and health care in general (Barr et al., 2005; WHO, 1973, 1978, 1988). IPE fosters

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the interdisciplinary sharing of knowledge. Open and collaborative communication creates an interpersonal conduit that eventually bridges knowledge gaps among the many disciplines and systems of care (Barr et al., 2005; Gonzalez & Yukihiro, 2013).

The cross-discipline knowledge gap. Improved communication between healthcare professionals is essential. Health care suffered from a breakdown in communication among educational institutions, health care providers, and consumers. Students align themselves with the ideals, values, and highly respected role models of their professions (Barr et al., 2005). According to Barr et al. (2005), the path to overcoming the individualistic, hierarchical, rigid behaviors of health care education and practice is through IPE collaboration.

IPE curriculum design is a channel for free-flowing communication through which learners across many disciplines find commonalities that influence their thinking and behavior over time. Individual thinking does not optimize patient care. Systems thinking across the minds of teams leads to better outcomes (Gilardi, Guglielmetti, & Pravettoni, 2014). This concept of free-flowing communication is an integral part of IPE philosophy (Barr et al., 2005).

Curriculum design and content: The need for common ground. Unlike conventional interdisciplinary learning, the deeply collaborative nature of IPE makes interpersonal relationships a cornerstone of well-rounded health care education. A common language is therefore of primary importance (Barr et al., 2005). According to Barr et al. (2005) and Pietroni (1992), an effectively designed curriculum advances the IPE message of ongoing dynamic improvement in theory and practice. To accomplish

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this, IPE develops, instills, and maintains a common curricular language that creates a safe environment for IPE participants to express themselves across many disciplines.

Bridging the professional cross-discipline chasm. IPE students experience behavioral changes within a curriculum (Barr et al., 2005). Most patient safety education was for post-professionals, even five years after the recommendation from the Association of American Medical Colleges (AAMC) to implement teaching on patient safety within pre-certification curricula (Barr et al., 2005; IECEP, 2011). There is mention of patient safety within existing curricula, but stand-alone courses are rare (Kiersma, Plake, & Darbishire, 2011). James (2006) suggested starting the curriculum with the end goal, patient safety, in mind.

Barr et al. (2005) stated that students should communicate despite distorted messages, misunderstandings due to a lack of decision-maker awareness, cross-discipline prejudices, and an absence of shared beliefs across disciplines. Obholzer (1994) suggested curricular design should anticipate participant anxiety generated by IPE. In response to the external pressures of time and in-the-moment urgencies, professionals naturally return to the security of familiar discourses and modes that are not inclusive of professionals in other disciplines (Barr et al., 2005; Foucault, 1972; Van Dijk, 1997). The aim of IPE is to reduce this stress (Barr et al., 2005).

Does the entry point of IPE have an impact? When to introduce the IPE curriculum. Traditionally, researchers believed IPE worked best after new professionals formed an identity within the roles, responsibilities, and cultural behaviors of their new profession (Dombeck, 1997; Pirrie, Wilson, Harden, & Elsegood, 1998). Areskog (1994) and Barr et al. (2005) suggested that IPE introduction take place as early in the pre-

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professional stage as possible. Critics suggested, however, that early pre-certification exposure to IPE collaboration was a distraction for students during the critical period when they develop an identity within the profession (Barr et al., 2005). Early stereotypes of a profession might embed in the new professional's identity (Dickinson, 2003; Turner, 1999).

Dombeck (1997) and Pirrie et al. (1998) believed that the stress of IPE may end after students gain experience with the IPE approach and better understand its importance in their professional lives. Barr et al. (2005) suggested strategically interposing IPE throughout the pre-certification experience of graduate students and continuing it well into their post-certification education. Manasse (2009) and Wlodkowski (2008) suggested students learn the IPE curriculum early in their programs. According to Kiersma et al. (2011), information on patient safety and medical error prevention exposure exists only at the post-certification level.

Does the saying *out of sight out of mind* hold true in IPE? *The null curriculum*. Patient safety is not always in the health care curriculum. Eisner (1985) suggested that patient safety and error prevention were part of the IPE “null curriculum” which he defined as the options students were *not* afforded, the perspectives they may never know about much less be able to use, and the concepts and skills that were not part of their intellectual repertoire (p. 97). Eisner (1985) suggested that the null curriculum fostered a

...position because ignorance is not simply a neutral void; it has important effects on the kinds of options one is able to consider, the alternatives one can examine, and the perspective from which one can view a situation or problem. (p. 97)

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The null curriculum is unavailable educational material of equal importance that is missing from an educational program. The absence of patient safety and error prevention education leaves the impression in the health care community that these topics are less important because they are rare in pre-certification curricula. Eisner (1985) demonstrated that the null curriculum had as much educational value as explicit and implicit curricula, and suggested that since there was such a huge array of IPE subject matter, researchers should examine the impact of patient safety (Eisner, 1985; Shepard & Jensen, 1990; Thistlethwaite et al., 2015).

Not one curriculum, but many. Barr et al. (2005) stated that professional jargon, the complexities of interdepartmental roles and responsibilities, customer-workplace diversity, expectancies of team performances, hierarchies, and the imbalance of power revealed that a single, patented IPE curriculum was probably unobtainable. Barr et al. (2005) and Reeves et al. (2010) noted that despite all the complexities and problems, professionals from diverse backgrounds come together to work on projects that produce excellent results. Thistlethwaite et al. (2015) argued that organization-controlled IPE interventions lacked long-term sustainability and effectiveness.

Learner readiness for IPE. IPE focuses on relationship building, behavior modification, communication, interactive teaching and learning styles, and other novel modes of curriculum design (Barr et al., 2005). For IPE to be effective, however, equal footing of all learners is necessary. Learners must prepare to encounter the limitations of traditional thinking. Barr et al. (2005) stated that one important goal of the IPE curriculum is to teach students to discern and navigate common, intentional communication barriers among individuals, disciplines, and organizations. Wlodkowski

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(2008) stated that obstructions, such as the deliberate exclusion of valuable information by a medicine specialty, undermined the basic philosophy of education and are subversive to the educational community. This type of systemic resistance to IPE could create delays, cause the misinterpretation and skewed application of IPE philosophies, and squelch inspired new thinking. Florynce Kennedy stated, “When a system of oppression has become institutionalized, it is unnecessary for individuals to be oppressive” (Wlodkowski, 2008, p. 125).

According to Barr et al. (2005) and Morgan (2006), intentional blocks to communication cause inaccuracies. IPE teaches that interactions within learning organizations should combine mutual respect, openness, and trust with clear, precise communication. These attributes are of paramount importance in overcoming oppressive systems of communication. They promote relationship-building and collaborative learning, and are precursors to change (Lewin, 1952). Barr et al. (2005) and Senge (1990) suggested that the best environment for an IPE learner was one that was conducive to innovative thinking, which in turn would forward the IPE philosophy of systemic inclusiveness, teamwork, and collaboration.

Does the structure of learning make a difference? Teachers’ attitudes may lead to student indifference toward patient safety. Barr et al. (2005) designated six different structural models by which to implement IPE. These domains represented the various structures within which IPE learning takes place. The domains provided a flexible framework for learner exposure to IPE curriculum, and answered questions regarding who provides the education, where it takes place, and its application. To whom was the

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education directed: pre- or post-certification students or both? What kind of structural combinations made up an IPE classroom or course?

Barr et al. (2005) explored the possible motives behind IPE interventions. Was learner edification the only intent? Was the production of a service or product also part of the education? Was it a combination of the two? Professors or industry personnel teach courses or *interventions*, which may be hybrids such as an on-campus course taught by a post-certification expert and sponsored by an outside vendor.

The location and level of training influences students' perspectives toward patient safety. Often formal or informal, a learning event within structural models (overt or implicit) might be consciously or unconsciously experienced (Barr et al., 2005). Other characteristics included the level of student participation and commitment that is unique to an individual or representative of a group and happened in a work setting or on a college campus for a specific duration of time. Working within a given domain characterized by the emotional connection, a learner may feel a need for change (advancing policy, for example, or improving patient care or professional practices). According to Barr et al. (2005), a psychological commitment to IPE meant a commitment to the belief in its power to modernize health care and change it for the better.

Does IPE need a safe intellectual environment? *The creation of cultural islands.* One goal of IPE educators is to create a safe place for change to occur. To enhance student preparedness to learn, IPE curriculum designers studied the idiosyncratic behaviors encountered in various disciplines to create a *common curriculum* to safely explore the basic, human-scale attributes of IPE, and eliminate barriers to cross-professional interaction (Barr et al., 2005; Morgan, 2006). Schein (2013) called this

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common-ground learning arena a cultural island, a figurative place of neutrality whereby individuals from different cross-discipline educational environments and cultures could safely share opinions and judgments while considering unfamiliar or uncomfortable concepts that did not necessarily agree with their beliefs. In such a learning environment, dialogues among learners with different perspectives and backgrounds could take place without censorship. IPE creates an atmosphere of environmental and cultural change. IPE philosophy and practices replace outdated approaches to cross-discipline communication that foster obstructive idiosyncratic behaviors (Barr et al., 2005).

Is culture a major influence in IPE? According to Barr et al. (2005), student acceptance of the IPE curriculum depended on the topic(s) studied, the nature of an intervention, and how relevant the subject matter was to the learner.

Discourse: Shaping culture. Foucault (1972) stated that the concepts, beliefs, practices, and behaviors associated with and expressed by a given culture (a medicine specialty, for example) constituted its discourse. Concepts of power and surveillance of health care institutions forward and maintain certain discourses in that community. Foucault (1972) said that individuals in power in medicine specialties determine and promote the acceptable social responses to, or acceptable discourse about, new concepts, approaches, convictions, and behaviors.

Barr et al. (2005) and Lewin (1952) agreed that the degree to which students accepted and internalized IPE philosophies and concepts reflected their ability to adapt to change. According to Barr et al. (2005), Lewin (1952), and Senge (1990), by adopting new mental models, students forward the IPE philosophy and create its culture. Acceptance of new perspectives leads to a collegial environment conducive to change

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because learners are not compelled to defend the status quo. To participate in IPE's holistic problem solving, students let go of their old, unsubstantiated beliefs and assessments. Students develop a new discourse.

A culture of patient safety influences healthcare students' awareness of patient safety issues. Koppel (2003) stated that IPE discourse engendered a search for common ideas, convictions, and behaviors that empowered individuals from diverse perspectives and backgrounds to consider and express new perspectives and ideas. After new convictions and behaviors become the cultural norm, individual and group actions merge. The faithful, unmonitored public observance of a no-littering policy is an example of the long-term effect of an accepted discourse in American communities.

Curriculum, discourse, behavior, outcomes: A cycle. Van Dijk (1997) held that the process or *cycle* of increased knowledge, language adaptations, behavioral change, and social acceptance is an example of IPE influence on modern medicine. Discourse among diverse professionals exposed to IPE resulted in a tendency toward, or an embedding of, collaborative thinking and action and a new, common language. Discourse technology has two dimensions, according to Van Dijk (1997). The first examines culturally derived language and the embedded meanings used during communication. The second explores the depth of discourse to determine the meaning of words and the shaping of professional views, attitudes, discernments, and principles.

A goal of IPE is to bring about change in students' perspectives toward patient safety. Barr et al. (2005) suggested that students become familiar with a wide range of communication models through curricular development. Hart and Fletcher (1999) and Jackson and Burton (2003) argued that to truly embed IPE philosophy, a student should

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be able to access IPE throughout the pre-certification experience in the context of small groups and as a member of a learning team with specified IPE characteristics. This wide range of exposure is a foundation for the education of each aspiring professional.

Barr et al. (2005) suggested exposure of students to the discourses of a variety of professional disciplines. Common curricula reinforce and encourage the collaborative thinking and behavior necessary to bring forth IPE's unique culture. According to Knowles et al. (2005), adult learners experienced the single-minded discourse of individual medicine specialties, and had pivotal experiences of the effectiveness of IPE whether it was a success or not. Adult learners contributed to the creation of IPE culture by providing input into course design and topic selection.

Lave and Wenger (1991) agreed that participants naturally experienced an infusion of new knowledge after emersion in the discourse of an IPE learning environment. Elkjaer (1999) proposed that acquisition and absorption of new knowledge depended on whether the learner was interested in it. IPE objectives should ideally be proposed *by the learners* and not by evaluators (Yarbrough, Shulha, Hopson, & Caruthers, 2011). The evaluator (institution) is often the designer and leader of IPE interventions. Koppel (2003) warned that adult education is learner-focused; organizations much avoid business-led IPE to protect learner autonomy. Management groups that direct IPE discourse toward a predetermined business objective undermine IPE efforts. IPE philosophy supports a discourse that enables IPE learners to see the bigger picture and create real change.

Positive attitudes for learning. Eagly and Chaiken (1993) reported that behavior, attitudes, and group dynamics influenced learner perspectives on IPE principles and

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practices. Developing positive attitudes is integral to the transfer of IPE learning. By introducing informal activities such as lunches, games, and icebreakers, IPE facilitators create environments where participants courageously reflect on their own resistant attitudes. In Schein's (2013) cultural islands approach, participants suspended the usual rules of hierarchy and authority and formed trusting relationships, preferably away from work or classroom settings during meals or recreation. Learner attitudes influence IPE performance (Eagly & Chaiken, 1993). Wlodkowski (2008) quoted Freud, "one cannot explain things to unfriendly people" (p. 7).

Individualistic social and group identities were ineffectual. These ineffectual theories, beliefs, and practices were replaced by new IPE philosophies (Ellemers, Spears, & Doosje, 1999). The commonalities of interests from the learner's perspective of IPE curriculum have benefits that greatly exceed their costs (Knowles et al., 2005; Wlodkowski, 2008). Freeth, Hammick, Reeves, Koppel, and Barr (2005) suggested that the various settings of IPE (geographic and figurative common-learning arenas) had a powerful influence on curricular design and learner outcomes. Freeth et al. (2005) suggested further investigation of common learning, integrated curricula, and curricular frameworks to engender group dynamics.

Barr et al. (2005) stated that effective IPE curricular design advanced common learning by improving listening skills, enhancing verbal communication, transforming the unwillingness to share data across disciplines, and neutralizing such unprofessional behavior as that observed in the competitive culture and protectionist "tribalism" of the health professions (Barr et al., 2005, p. 36). The concept of common learning ground, Schein's (2013) cultural island, resulted in a more comprehensive IPE curriculum.

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Barr et al. (2005) felt that IPE philosophy and practices would eliminate regionally discrete training programs and stop the proliferation of the one-way, non-collaborative learning of health care specialties. Meads et al. (2005) suggested the IPE curriculum, delivered on Schein's (2013) cultural island of safe common learning, would disrupt uneven information-sharing and any future planning for single-discipline education. Resultantly, the creation of safe learning environments would address changes deemed appropriate to the collaborative interaction of IPE.

Was the problem of patient safety and medical error prevention fixed?

Evaluations and outcomes. Effective IPE agendas result in meaningful change. The Centre for the Advancement of Interprofessional Education (CAIPE, 2001) advocacy group extolled continual improvement in patient care and inclusive decision-making as integral to an effective IPE curriculum. The sharing of knowledge across many health care disciplines improved practices within those specialties, and the demonstration of respect for the contribution of each discipline increased work satisfaction across the board (CAIPE, 2001). Barr et al. (2005) stated that this ideal, theory-based version of IPE overlooks the powerful influence of environmental, political, cultural, and hierarchical variables. If IPE is a legitimate means for change in health care, it is necessary to explore and evaluate the psychosocial impact of IPE on learners (Barr et al., 2005).

Typologies. Barr et al. (2005) evaluated 107 studies of IPE interventions in a rigorous, systematic review of effectiveness and change in the IPE curriculum. The investigators used Kirkpatrick's (1994) quantitative four-point typology, developed in the 1960s, to evaluate worker training for business production (Barr, 1999). Barr et al. (2005) extended Kirkpatrick's methodology by two processes to gain a more in-depth qualitative

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assessment of learner response and receptivity to new IPE information and training (Slater, Lawton, Armitage, Bibby, & Wright, 2012). These two extensions covered changes in organizational practices and benefits to patients or clients.

The team construct. Teamwork improves patient safety. Barr et al. (2005) strongly suggested that teams, teamwork, and collaboration are integral to the success of IPE; parameters of time, distance, and defined endpoints are important influences on whether teamwork has value, significance, or efficacy. Group behavior determines how well team members function together; a team or collaborative effort is only as strong as the weakest of its individual participants (Barr et al., 2005). An individual's commitment to a well-defined objective determines an initiative's short- or long-term success. IPE focuses on supporting the individual and the individual in a team context, but "teams differ in structure and modus operandi depending upon the task in hand, the mix of professionals and their formal relationships" (Barr et al., 2005, p. 4).

Team formation. According to Barr et al. (2005), Tuckman (1965), and Tuckman and Jensen (1977), students should know that an ideal team does not exist in IPE. Collaboration depends on team effort, but team formation and actions are complex, transitory, and project-dependent. Reeves et al. (2010) described the complexity of team formation and actions in the real world as "a cocktail of individual, professional, organizational, educational, and structural factors which can impede their performance and function" (p. 4). According to Belbin (1993), a successful team improves by analyzing its various elements. Once a team understands itself, after overcoming shortcomings and inadequacies, suitable changes follow. Drinka, Miller, and Goodman

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(1996) stated team motivation and style become leader-dependent over time, and change as the work environment moves from a normal to conflicting state.

According to Wlodkowski (2008), the focus of IPE curriculum should be on the individual within a team context, because misunderstandings and poorly defined objectives were common occurrences between individuals that caused disrespect. Barr et al. (2005) and Tuckman (1965) stated that teamwork and collaboration involve the commitment of individuals to an effort, but this process is not static. The nature of teams and their efforts expand and contract depending on mission objectives. IPE initiatives such as the Expert Patients Programme (NHS, 2004) demonstrated this in case studies of chronically ill clients educated in self-management (Barr et al., 2005; West, 1996).

Evaluation of Current Practice

Is collaboration like glue? Healthcare provider collaboration is essential to improving patient safety. According to the IECEP (2011), collaboration is a core competency of IPE for successful teams and teamwork. IPE collaboration constitutes a crucial means of bridging the gap between the current state of patient care and the desired future state of patient care. These constructs have strengths and weaknesses. IPE practitioners recognized that the weaknesses could lead to dysfunctional performance and the derailment of important initiatives.

CAIPE (2006) described interprofessional collaboration in health care as a process in which patients were the focal point of team-oriented health and social-care initiatives. Providers worked synergistically to enhance or magnify the efforts of all, thereby magnifying the total quality, efficiency, and effectiveness of medical care. Barr et al. (2005) felt that IPE's collaborative focus should be on the prudent care of patients.

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Like team formation, collaboration has multiple applications and teamwork is only one of its elements. Informing IPE learners of the difficult realities of teamwork is essential.

Tuckman (1965) stated that many teams were dysfunctional, especially in health and social care, and that poor work environments contributed to negative results for patients.

According to Engestrom, Engestrom, and Vahaaho (1999), teams in negative work environments fail to fit the traditional model of teamwork or networking. There was a correlation between the happiness and satisfaction of team members and employee turnover (Engestrom et al., 1999). Barr et al. (2005) stated that overcoming internal and external team discord requires members reflecting. Maintaining focus on team objectives by overcoming distractions is critical to team success.

According to Hugman (1991), Walby, Greenwell, MacKay, and Soothill (1994), Wickes (1998), and the principles of IPE, team conflicts can resolve by instructing students to ease competition among co-workers, professionals, disciplines, and organizations. Students should be familiar with the byproducts of the misapplication of authority, position, educational level, sexual roles, and social standing. Barr et al. (2005) viewed the strength of teamwork as “the tried and true mechanism for collaboration, enjoying a hallowed place in interprofessional practice” (p. 86). Borrill, West, Shapiro, and Rees (2000), however, explained that the quality of team performance determined the effectiveness and clarity of a specified objective, which influenced communication, member satisfaction, and innovation.

Meads et al. (2005) held that IPE collaborations routinely break down. Failure of team collaboration relates to systemic and cultural weaknesses, not individual incompetency. Collaboration must be objective-focused, strategic, and aware of system

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contingencies (Engel, 1977; Von Bertalanffy, 1971). Barr et al. (2005) suggested that a collaborative, inclusive approach to best practices and high-quality patient care provided the best patient safety outcomes. Diverse and scattered disciplines solving problems and making decisions from individualistic points of view hampered best practices.

How deeply was the fix felt? *IPE and group behavior.* Workers should learn critical safety behavior at the pre-certificate level. As stated by Barr et al. (2005), the core competencies of collaboration, teams, and teamwork are crucial to the success of IPE endeavors. To counteract a potential loss of focus and cohesiveness, IPE teachers implemented group-behavior theory as a means of clarifying and solidifying project objectives (Barr et al., 2005). According to Bion (1961), intergroup behavior reflects the level of understanding of declared common objectives among communities of people. When goals are clear, appropriate, and a good emotional fit, teams imagine ideal outcomes and set differences aside (Bion, 1961; Reeves et al., 2010; Senge, 1990; Wlodkowski, 2008). When shared objectives are unclear and participants have diverse ideas about what the mutual goals should be, teams exhibit antagonism and bias.

Well-defined, inspiring, mutual objectives. According to Barr et al. (2005), when IPE learners pursued a specific task or mission, group collaboration was dependent upon the clarity and specificity of project goals. The clarification of objectives was an ongoing process, and IPE redirected the central focus of objectives as group-member intent dictated. Barr et al. (2005) felt the IPE curriculum aligns learner exposures, experiences, and outcomes with intervention objectives (e.g., common learning, quality of care, patient safety, teamwork, and collaboration). Barr et al. (2005) stated that IPE curriculum maintained only 12% focus on creating group and team collaboration; 47% of the

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curriculum related to preparing individuals to recognize the commonalities of professions, and 41% focused on advancing high-quality care and patient safety. They revealed that 79% of IPE took place during post-certification training, 19% took place before certification, and only 2% took place at both the pre- and post-certification levels (Barr et al., 2005). Barr et al. (2005) cited these statistics as evidence of the need to increase IPE for students earlier in their careers, including team dynamics and group-collaboration processes.

Morgan (2006) suggested that the imbalance in the timing and delivery of IPE curriculum created a barrier to the learning process because it provided no opportunity for pre- and post-certification students to exchange knowledge in supportive and mutually beneficial ways. Organizations with the best IPE intentions often inadvertently impeded the free flow of information and knowledge. Morgan (2006) explored the reasons for the loss of objectivity that result from group and organizational behavior from the perspective of organizational behavior theory. IPE at both pre- and post-certification levels was theory- and practice-based (Morgan, 2006). The undergraduate level emphasized student edification. There was a significant learning gap between the levels due to the financial motivation of professional organizations. Morgan (2006) explained ways business organizations influence IPE outcomes, learning, and objectives.

Subgroups. Describing a potential loss of focus at the pre-certification level and the low levels of behavioral change and sustainability at the professional level, Morgan (2006) noted the formation of counterproductive subgroups in organizations. These are factions that lost sight of reality and operated from mental pictures that were not congruent with the primary goals of their companies. In violation of the principles of

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adult learning and IPE, these groups used IPE learning processes to promote their own self-serving initiatives. Morgan (2006) stated that increased barriers to learning resulted from individual post-certification groups flaunting their preeminence, segregating themselves from the whole, and creating their own self-interested political systems. An organizational subgroup's biased perspective of its value, power, and position often distorted the company's IPE mission. Disciples of such a group made ineffective decisions and inhibited opposing views and change. Morgan (2006) suggested this type of behavior may reduce feedback and sustainability of IPE initiatives at the post-certification level due to the development of defensive routines that reflected poorly on a group's culture. This single-loop learning shielded managers and significant stakeholders from problem-solving information. When a more in-depth, double-loop learning model was absent, "group think" flourished (Morgan, 2006, p. 86).

Wlodkowski (2008) stated that the domination of an IPE intervention by its sponsoring organization or subgroup could explain lowered or absent learner motivations, which lowers outcomes at Level 2 (changes in attitudes and perceptions) and Level 3 (behavioral changes). IPE philosophy was inclusive of all health care stakeholders. The Barr et al. (2005) review revealed a disproportionate focus on nurses and doctors, representing 89% and 82% respectively. Dentists and midwives represented only 6%. The dental profession was most in need of increasing its IPE focus (Barr et al., 2005).

IPE and collaborative learning. According to Bruffee (1995), collaborative learning describes a host of new procedures in education to help students learn by working together. Ventimiglia (1994) defined collaborative learning as a process in which students and teachers come together as partners to build knowledge and

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methodically establish and accomplish common goals. According to Senge (1990), IPE curriculum teaches learners to approach an objective from a variety of perspectives. In anticipation of well-rounded, holistic curricula, IPE developers introduce collaborative learning early to pre-certified students by making practical use of their commonalities of knowledge, information, and experience. According to Barr et al. (2005), post-certified students in traditional health care practices learned that the cross-discipline collaboration of IPE resulted in explorations that were not possible within the context of single-discipline professional training. They compared their roles, duties, responsibilities, powers, work structures, and emotional concerns with those of post-certified students who were already involved in collaborative interdisciplinary education. Students benefited from sharing commonalities of work with new cross-discipline associates and exceeded expectations of official policy (Axelrod, 1984; Rowley & Welsh, 1994).

Blake and Mouton (1964), Brown, Condor, Mathews, Wade, and Williams (1986), and Kilmann and Thomas (1977) stated it was imperative that IPE have a unifying effect on all learners to circumvent the usual interpersonal conflicts that arose within medical disciplines. The source of conflicts included specialty biases and prejudices, staffing problems due to worker upset and overwork, misplaced hierarchical behavior, and people excluded from important information regarding patient safety. Knowles et al. (2005) and Wlodkowski (2008) reported that IPE encouraged participants to focus on the objectives of a given intervention and reflect on any personal feelings that could influence its outcome. As adult learners, students became aware of the value of their life experiences in IPE problem-solving and intervention, and voiced their opinions, experiences, expertise, perspectives, and worldviews. Aggregate student knowledge and

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experience integrated into the IPE curriculum to create more effective and efficient approaches to learning and teaching (Knowles et al., 2005; Wlodkowski, 2008).

Obholzer (1994) explained that knowledge gained through adult learning methods could be highly conducive to debate and change, and often led to a more utilitarian fit. IPE engendered dialogue to help mitigate anxieties about change among students of different backgrounds and beliefs. After familiarization with the technique of exchanging knowledge openly, learners suspended their judgments as much as possible until after they fully explored an IPE initiative or intervention (Allport, 1979; Barr et al., 2005; Knowles, 1975; Kolb, 1984; Mann et al., 1996; Schon, 1987). Having autonomy and power were significant motivators for adult learners (Knowles, 1975).

According to Barr et al. (2005), representatives of all participating disciplines needed to be present during IPE interventions to discourage scapegoating. Participant absence at an intervention created a tendency among others to view the absent party as the cause of a problem. Eagly and Chaiken (1993) reported that IPE advanced student learning by holding facilitator-led seminars in which students shared their prejudices through confrontational dialogue to expose barriers to communication (e.g., isolated individual or group attitudes, preconceived notions, and unexplored prejudices).

According to Hewstone and Brown (1986) and Spears, Oakes, Ellemers, and Haslam (1997), learners attempt to overcome the stereotyping of non-group or cross-discipline participants by sharing familiar commonalities to advance IPE collaboration among various disciplines. Group commitment to a common IPE curriculum and its objectives helps students suspend their prejudices and social differences long enough to complete a successful and effective IPE intervention and form a new, shared mental model (Senge,

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1990). Sometimes the failure of a group to commit to the IPE philosophy (i.e., equal status of individuals, groups, and disciplines) results in the creation of a separate faction that does not align with the objectives of a project (Allport, 1979; Brown & Williams, 1984; Tajfel & Turner, 1986).

IPE performance and institutional perspectives. Institutional commitment to patient safety influences IPE success. From an economic perspective, IPE must convince stakeholders of its value, viability, and sustainability (Barr et al., 2005). IPE must demonstrate benchmarks of performance for each discipline and initiatives of cross-discipline worthiness to gain much-needed resources. Participants must have facility in competencies shared by all fields of health care, identify the uniqueness of their own arenas, and demonstrate proficiency in complementary efforts with other disciplines. Collaborative competency frameworks supported the ethical standards of all participants, and encouraged interdisciplinary knowledge sharing and the use of mutual reflection to advance IPE principles and practices (Barr et al., 2005).

Human resources in service of patient safety and error prevention. According to Barr et al. (2005), the emphasis on IPE competencies prompted curriculum developers to apply IPE versatility to patient care. This involved the creation of a knowledgeable, respected, interchangeable, IPE-trained workforce to mitigate problems of recruitment and retention (Barr et al., 2005). IPE provided innovative, nonthreatening organizational policy changes without isolating stakeholders or dislodging existing services or policies (Gunn, Hanisch, & Wood, 1995; Reason, 1994). Unfortunately, the acceptance of these initiatives depended on the availability of resources such as IPE instructors, space for instruction, funds, and political reciprocity (Challis et al., 1988). Availability of resources

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influenced the outcomes of all collaborative efforts, including IPE. IPE needed teachers with diverse medical backgrounds, competencies, and experiences to provide links between institutions, curricula, and learners.

Low level of participation by professional teams. Lack of resources and institutional support does not explain the low incidence of post-certification collaborative involvement in IPE initiatives (Barr et al., 2005). The low impact of IPE-intervention demonstrated the inability of teams to sustain behavioral changes over time and to the unwillingness of professional teams and groups to put changes into practice. According to Knowles (1975), adult learners experienced a dissonance between the knowledge they already had and a need to change during the IPE processes. Barr et al. (2005) felt this low outcome demonstrated that teamwork was the "missing link" in IPE (p. 93). Barr et al. (2005) stated, "while collaboration takes many forms, teamwork is by far the best tried and tested mechanism for collaboration, enjoying a hallowed place in interprofessional practice" (p. 86).

The three primary focuses of IPE include: individual training, group and team collaboration, and improving services and quality of care. These reinforce each other by forwarding IPE precepts. Barr et al. (2005) suggested that the failure of any one of these elements systematically terminates all the others. According to Reeves et al. (2010), investigators have yet to establish the empirical, conceptual, or theoretical underpinnings of teamwork which is essential to adult learning and IPE.

IPE Sustainability

According to Areskog (1994), the earlier exposure of pre-certified health care learners to the IPE curriculum, the more readily they accept it and the more effectively it

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becomes embedded in their already-demanding academic lives. Barr et al. (2005) stated that *embeddedness* in the context of IPE meant the degree to which IPE directs the thinking and behavior of health care students, both pre-certified and as professionals. Barr et al. (2005) discussed this acceptance, a metric of the effectiveness of the curriculum, in terms of typologies (classifications for evaluating learning processes), including those that assessed the long-term effects of IPE. According to Barr et al. (2005), student acceptance of the IPE curriculum depended on the topic(s) studied, the nature of interventions, and how relevant the subject matter was to the learner.

Does embeddedness lead to behavioral change in IPE? *Change theory.* IPE philosophy, practices, and discourse allowed for an exploration of change theory, including Lewin's (1952) unfreeze-change-freeze process and Kirkpatrick's (1994) four-level typology. Similar perspectives on change included determination of organizational objectives compared to the current state, how things are. Lewin (1952) suggested that a middle path assess the nature of the distance between ideal and reality, and determine a course of action based on effectiveness and efficiency. If a fact-based decision gets the desired result, the objective is complete. If not, learners must attempt the next best alternative (Ansoff, 1992; Barr et. al., 2005).

Why is teaching patient safety and medical error prevention appropriate for the pre-certification level? *Timing of IPE intervention.* Wlodkowski (2008) believed that the experience gained in a pre-professional IPE curriculum on patient safety and medical error prevention (a curriculum in which students holistically involve their spiritual and physical selves in problem-solving solutions and interventions) became conceptually more accessible and more diverse in application. Ideas that originated in

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artistry, imagination, and performance enhanced neuronal connections and synaptic development in the adult learner, providing access to deeper meanings (Wlodkowski, 2008).

Long-term change. Wlodkowski (2008) stated that motivation for the pre-certification IPE learner was an internal affair, more aligned with the basic principles of adult-learning theory than with external motivation found at the professional level. Pre-certified IPE health care students have concepts embedded within subjects. IPE is an important tool for repairing and improving the health care system for the future of all participants in health care.

The Future of IPE

What does the future hold for IPE, patient safety, and medical error prevention? According to Barr et al. (2005), relationship building, teamwork, and collaboration are the intended results of IPE that define the roles and responsibilities of health care professionals of the future. Most importantly, IPE reduces stress in medical professions through a collegial learning environment that allows for more and better communication, knowledge sharing, and communal decision-making. Barr et al. (2005) suggested that these forms of collaborative learning were precursors to improvement in the quality of patient care.

Past interdisciplinary health care education focused on preventing isolated cases of medical errors and other breaches in patient safety due to an atmosphere of blame and scapegoating (Barr et al., 2005). However, the lapses originated at a deeper, systemic level, influenced by factors both inside and outside of the health care system. Barr et al. (2005) found that internal origins of patient safety infractions included:

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1. Errors in planning and delivering treatment.
2. An absence of a system-oriented strategy for improving the training of IPE students both pre-certified and professional.
3. Team mistakes and lapses in planning stages.
4. Individual slip-ups in the execution of treatment and tasks.
5. A failure to recognize that recovery from errors was a team process.

The medical mistakes resulting in many pediatric deaths associated with open-heart-surgery at the Bristol Royal Infirmary had internal sources, such as an absence of interprofessional collaboration and communication, an unwillingness among health care professionals to share knowledge with specialists from other fields, and a failure to coordinate patient progress among interprofessional treatment teams (Department of Health, 2001). Barr et al. (2005) stated that diverse disciplines learning to work together in the service of superior patient care was not only a challenging and worthy goal, but a mandate for excellence in all aspects of the health care profession. “The acid test is not only whether interprofessional education leads to interprofessional practice, but whether it reinforces professional education and practice” (Barr et al., 2005, p. 38).

Kirkpatrick’s typology supported. Kirkpatrick (1994) held that because changes in conceptual responses occur over time and with exposure to new knowledge, measuring the behavioral results of IPE interventions is time-dependent; Level 3 behavioral changes unmonitored with a time-series model of research could measure long-term behavioral changes. Wlodkowski (2008) stated that “practice makes perfect” (p. 319). The sooner the implementation of IPE, the sooner effective outcomes occur.

Barr et al. (2005) suggested that the IPE curriculum of the future would influence and *be influenced by* research and its practical applications by learners, advancing IPE

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philosophies and improving the quality of patient care overall. IPE advances collaboration, systems thinking, and improves communication in health care institutions. Barr et al. (2005) and Thistlethwaite et al. (2015) posited that an IPE curriculum focusing on patient safety, medical error reduction, and high-quality health care would be most effective by appealing to the reflectivity of student minds, and that further developments in problem-solving may figure prominently in the future of IPE.

Summary

Considering the significant response to *To Err Is Human* (Watcher, 2004), the results of the Harvard Medical Practice Study (Brennan et al., 1991), and James (2013), it is surprising how little data is present in the relevant literature of patient safety and medical error prevention in pre-certification curriculum. This review of the literature on IPE and its curriculum focused on the following:

- The 1999 U.S. publication of the IOM report, *To Err is Human*, and its release a year later in book form (Kohn et al., 2000), called global attention to the alarming number of injuries and deaths that were occurring in the U.S. because of medical error. The startling numbers and their financial costs to all stakeholders produced a cry for intervention in the United States and a national effort to reverse the trend.
- In Great Britain, reports on two watershed events involving the negligent medical mistreatment of children resulted in a similar outcry and demand for action (Kennedy, 2001; Laming, 2003).
- Meads et al. (2005) supported the Swiss cheese metaphor put forth by Reason (1990, 1997, 2000) that explained how accumulated medical errors created "holes" in health care systems that over time provided latent opportunities for accidents to occur (p. 62).

Medical errors and other breaches in patient safety exist due to systemic causes, not simply because of individual mistakes. Reducing or eliminating errors through IPE is the goal. Research on the practices and behavior of health care providers determines how

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and when to deliver health care education. There was a scarcity of references to pre-professional education in patient safety and medical error prevention even though the IOM recommended this strategy in its 2003 report.

This review included concepts most readily affiliated with IPE in the literature: IPE in practice, foundations, the educational curriculum, IPE as interpersonal conduit, curricular content, learner readiness, Schein's (2013) cultural island concept, evaluations and outcomes, the team construct, collaboration, group behavior, the future, the adult learner, collaborative learning, and acceptance and embeddedness. These concepts illuminate the strengths and weaknesses of the IPE curriculum and its ability to teach patient safety and medical error prevention. Early learners are more receptive, both emotionally and clinically, to new modes of education. Concepts of patient safety applied at the beginning stages of a health care student's career remain relevant.

Conclusion

This investigation paid particular attention to Kirkpatrick (1994) and Barr et al.'s (2005) methods for evaluating learning processes, typologies, and disconnects in Level 3 behavioral metrics. Seminal theorists like Morgan (2006), Wlodkowski (2008), and Knowles et al. (2005) provided insight into the loss of team participation during IPE evaluations. Wlodkowski (2008) posited ideas on brain function and development to determine the best time for learner exposure to IPE. A gap exists in the IPE of pre-certification learners, which explains the low participation of teams at Level 3 of Kirkpatrick's typology of post-certification practices, which justifies increased demand for more rigorous research (Thistlethwaite et al., 2015).

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The literature review revealed an urgent need for the dissemination of patient safety and medical error knowledge in the pre-certification education of medical professionals. Such an improvement in the IPE curriculum could increase the scope of IPE in general. Overall, however, the idea of including IPE for health care students at the beginning of their careers remains crucial to improved patient outcomes. Despite many years of focus on the virtues of IPE, James (2013) reported that 200,000 to 400,000 deaths due to inadvertent, preventable errors still occur each year.

Chapter Three: Methodology

Phase One: Content Analysis

Methodology for phase one, the qualitative portion of this study, was content analysis (Wilkinson & Birmingham, 2003) in the form of keyword searches and in-context analyses (Grbich, 2013; Krippendorff, 2004) to determine the priority given to relevant concepts in the IPE curriculum. Content analysis is the research method for creation of valid inferences by categorizing and coding textual materials, methodically assessing texts/data qualitatively with the ability convert the qualitative findings into quantitative data (Krippendorff, 2004). Content analysis of word counts measured the frequency of use of keywords in the databases of the pre-certification IPE curricula of eleven medical teaching institutions between 2005 and 2015. These eleven medical teaching institutions met the demands of the IECEP (2011).

The research was the IPE curriculum web page data for each school. The dates were from between 2005 and 2015. The number of pages was 1,113, a total of 443,100 units analyzed by the QDA Miner software program. QDA Miner counted the number of assertions and presented the material as tables, which illustrated the meanings of the categories and assertions to the reader. The content analysis developed inferences and conclusions from the data analysis and suggested answers to the research questions.

This qualitative study focused on a single phenomenon (Creswell, 2003). What importance do medical schools place on patient safety and medical error prevention

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education at the pre-certification level? The investigation performed keyword searches and in-context analyses to determine the priority given to relevant concepts in IPE curricula (Grbich, 2013; Krippendorff, 2004). The data derived from QDA Miner determined the level of importance of these concepts in the pre-qualification IPE programs. The investigation measured the frequency of exposure of health care students to the concepts of medical error and patient safety during IPE. The investigation required purposeful sampling. Content analysis was chosen due to its reliability, validity, and configuration of measurement (Rudestam & Newton, 2007). The investigation used constructivist knowledge claims during analysis of the interview data (Grbich, 2013; Krippendorff, 2004).

The following are tools the researcher used to further the investigation: data-analysis software QDA Miner 4, Key Word in Context (KWIC), and Hyper RESEARCH. PubMed, EBSCO, and ERIC databases provided publication retrieval. Content analysis, a systematic text analysis, directed the researcher to contextual and conceptual findings within web page content. Krippendorff (1980) established rules for conducting content analyses for reliability and validity. As in normal coding protocol, content analysis required identifying the unit of analysis, choosing a set of categories, coding, tabulating the findings, illustrating the material, and drawing conclusions from tabulations and diagrams (Adams, Khan, Raeside, & White 2007). Content analysis depends on the coding process to generate hypotheses from data (Rudestam & Newton, 2007). Resultantly, this research benefited from qualitative software programs (Creswell, 2003).

The units of analysis for this research were the web pages of IPE programs at eleven medical professional schools: University of Washington, University of Texas

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Southwest Medical School, Johns Hopkins, University of Southern California Medical School, University of Texas Health Science Center at San Antonio, Stanford University Medical School, Oregon Health Science University, University of San Francisco Medical School, UCLA Medical School, Harvard Medical School, and New York University Medical School of Nursing. The investigation gathered data from the websites of these schools regarding the following terms: *education, stress, motivation, collaborate/collaboration/collaborative, quality care, patient safety, error prevention/reduction, team/teamwork, diversity, communication, culture/environment, and costs.*

Content analysis was ideal due to the lack of occurrence contamination and noise that could influence the results of the investigation. While processing enormous volumes of information, content analysis is content specific, focused on the target of research, thereby rendering valuable research outputs (Krippendorff, 2004). Content analysis of website data allowed the use of “if-then” declarations to infer answers to the research questions (Krippendorff, 2004, p. 35). QDA Miner 4 was ideal for this research, rather than other software program, due to its ease of use, coding and retrieval capabilities, statistical visualizations, and cost effectiveness. Instructions for utilizing QDA Miner 4 as the apparatus/software for defining the independent variables and themes are available at www.provalis.com. In phase two, six IPE practitioners completed open-ended, structured/guided interview questions (see Appendix B, C, A1, B1, R, and Q). Subsequently, the researcher integrated data from the content analysis with the qualitative data from the interviews (Krippendorff, 2004; Rudestam & Newton, 2007).

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Procedure. These themes emerged repeatedly throughout the literature review and were central to the research question:

- Collaborate
- Collaborates
- Collaboration
- Communication
- Costs
- Culture
- Curricula
- Curriculum
- Diverse
- Diversity
- Education
- Environment
- Errors
- Ethical
- Ethics
- Injuries
- Motivation
- Quality of care
- Simulation
- Simulations
- Stress
- Team
- Teamwork
- Patient safety

The research sequentially followed Krippendorff's (2004) content analysis model.

The steps are as follows:

- Research question
- Literature review
- Themes
- Data Collection
- Coding of themes
- Content Analysis
- Inferences
- Answer to research question
- Interviews (structured interviews)
- Enriched answers to research question
- Evaluation of implications

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This form of content analysis is well-documented. Other researchers who used this procedure include Mchakulu (2011) and Park (2008).

Participants. The research participants were eleven university medical/dental IPE program websites from 2005 to 2015 and six IPE professionals. The eleven IPE program websites from 2005 to 2015 represented well-established IPE programs with availability for fixed/unchanged data recording (Creswell, 2003). Interviews were bias-free in a controlled/guided structure to access participants' perspectives on the research questions (Creswell, 2003).

Measures and covariates. Park (2008) observed measures and covariates in QDA Miner content analysis. Content analysis was an inexpensive and easily understood research method. Content analysis provides better data when combined with other research methods, such as interviews, observation, or website data analysis. However, content analysis is purely a descriptive tool and describes what the investigation analyzed. This method does not reveal the underlying motive of the analysis and patterns. Content analysis reveals *what* is there, but not *why*. Materials must be available for researchers to conduct a content analysis (Krippendorff, 2004).

Summary: Phase one. The methodology section provided details to confirm the research was valid, reliable, and controlled and that data collection met all the requirements of content analysis (via QDA Miner 4). The validity and reliability of the research was triangulated with evidence gained with interviews. These details enhanced the quality of the research process, repeatability, and validity of findings regarding the research questions (Creswell, 2003). The research question for phase one was, does

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patient safety and medical error prevention education have importance in pre-certification interprofessional curriculum?

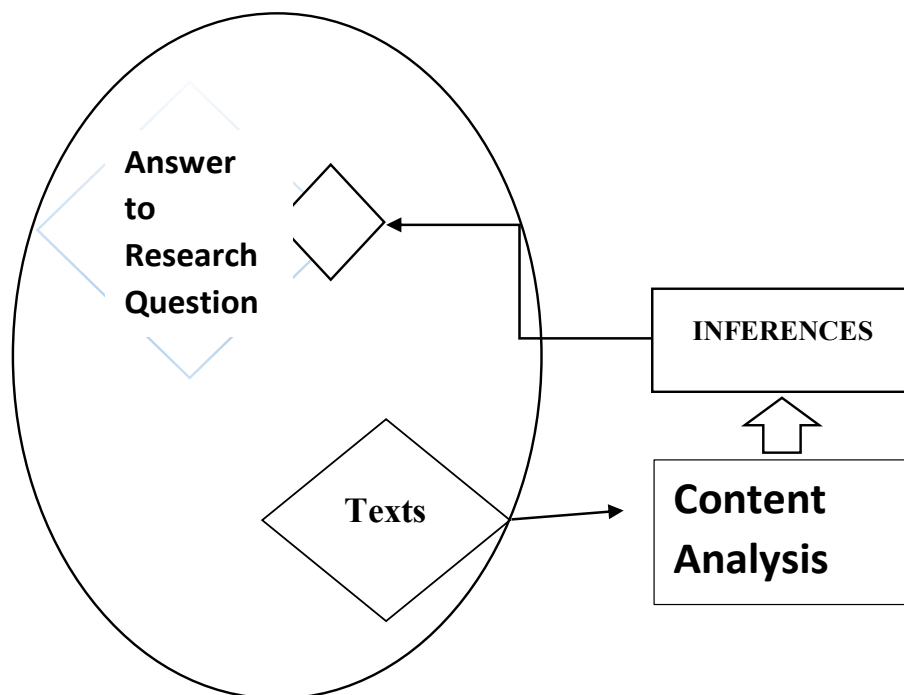


Figure 1. Components of content analysis. Content Analysis: Answering Questions Concerning Context of Texts. Adapted from “Content analysis: An introduction to its methodology” by K. Krippendorff, 2004, p. 82.

Contextualization of Figure 1. Krippendorff’s (2004) model/framework illustrated the connections between data/text, content analysis, inferences, and research question.

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The research question, is patient safety and medical error prevention important to pre-certification IPE curriculum, was the central focus of content analysis (Figure 1). By integrating structured interviews into the model, Krippendorff's framework of content analysis provided flexibility and inclusiveness of the research. Subsequently, the model provided a step-by-step process for answering the research question. Krippendorff's framework was the guiding structure for this study. Providing inputs that lead to plausible answers to the research question, the accuracy of the model was evident. The elements of content analysis included data collection, literature review, independent variables, themes-codes, analysis, and interpretation-inferences. As designers, researchers have the freedom to shape the model to fit the individual investigation. Researchers can design their project to join with other hypotheses to formulate a more concise and generalizable answer to research questions. By combining methods of inquiry to define the research question, the present study added structured interviews to provide alternative perspectives (Krippendorff, 2004).

Phase Two: Guided Interviews

The purpose of the second phase of the research design was to explore how practicing IPE professionals respond to open-ended interview questions. The coding and interpretation of interview questions and responses guided the research questions.

RQ1: Is patient safety and medical error prevention important to pre-certification IPE curriculum?

RQ2: Is patient safety and medical error prevention embedded during pre-certification IPE?

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Cross-referencing the initial investigation, six IPE practitioners completed interviews concerning the teaching of IPE students about patient safety and medical error prevention. This investigation was of personal interest because I have over 40 years of experience in the medical profession as a dentist and laboratory specialist and view patient safety and medical error prevention as critical to positive patient outcomes. Because of my peer connections with IPE professionals, e-mail and telephone communication was simple during phase two of this research. I selected IPE professionals from samples at the eleven medical schools with an IPE website between 2005 and 2015. The investigation design had a purposeful strategy. To maintain consistency of this research, the framework and approach of this investigation was qualitative.

Procedure. The multiple stages of data collection took place in a normal setting using interviews with active participants with open-ended questions to gather relevant data. Accordingly, I conducted the literature review at the beginning of the research process to frame and organize the sequential qualitative investigation. To develop themes from the emerging data, phase two of this research required collection of responses to open-ended questions in guided interviews of six IPE professionals. The emergent themes contributed to clarifying/informing the research questions.

Following data collection, the investigator positioned the interview data within *bits* (smaller groupings of categorized data) with a loose conceptual framework by focusing and binding the analysis to concepts of *who* (IPE students and IPE professionals) and *what* (IPE patient safety and medical error curriculum). Interview

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questions structure were open ended and oriented participants' perspectives to the research questions (see Appendix B, A1, B1, C, Q, and R) (Hahn, 2008).

Participation. Prior to conducting the investigation, the research passed institutional review board (IRB) review. The ethical considerations of the research investigation adhered to the standards of the research community (see Appendix E). Participant selection resulted from a purposive sampling method (Creswell, 2003). Six expert IPE professionals, medical school university professors, participated in the research project. "The participants, if you will, are the experiential experts on the phenomenon being studied" (Rudestam & Newton, 2007, p. 107). The professors volunteered to participate to advance IPE research. The participants were readily available by telephone and e-mail. Participant selection depended on the ability to provide unique perspectives that informed the research questions (Creswell, 2009; Kuper, Lingard, & Levinson, 2008). The six IPE professionals offered to participate in structured interviews (Rudestam & Newton, 2007). The purpose was to determine the exposure of pre-certification medical students to patient safety and medical error prevention in IPE curricula. IPE professionals are uniquely positioned to further this investigation because they experienced training and now have experience in the workforce.

Measures. According to Rudestam and Newton (2007), "The instrument of choice for the qualitative researcher is the human observer. Thus, qualitative researchers place particular emphasis on improving human observation and make no claims for the reliability and validity of the instrument in the rationalistic sense" (p. 109). I emailed and spoke by telephone to the participants. The open-ended interviews generated responses about the investigation's research questions. Willing to share their perspectives, the

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career IPE professionals had intimate knowledge of the research topic. The open-ended questions asked the participants to reflect on the importance of patient safety and medical error prevention in IPE (Rudestam & Newton, 2007).

Data collection. Recruitment. After the completion of phase one, I selected six participants based on their perspectives as IPE professionals and willingness to contribute to this investigation (Creswell, 2003). One of the participants was champion of IPE and the other five were IPE instructors. The interviews were neither “disruptive” nor hampered by “gatekeepers” because the participants were very interested in advancing IPE research (Creswell, 2003, p. 184). The recruitment of two participants by telephone was the first step. After having the option to participate or not and learning the nature of the study, the participants volunteered to participate in the study. To ensure free will, participants had permission to withdraw from the study at any time or to not answer personally or professionally sensitive questions.

Instrument description. Participants received open-ended questions via e-mail and by telephone (see Appendix A1, B1, B, C, Q, and R). The interview questions stimulated participants’ responses and lead to reflective perspectives of the research questions. The instrument elicited discussion and reflection by the IPE professionals on the importance of patient safety and medical error prevention education at the pre-certification level. This data presented a personal perspective on inferences established in phase one’s content analysis (see Appendix A1, B1, B, C, Q, and R). The instrument determined if a gap exists between the importance of IPE and medical error prevention at the pre-certification level.

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Interview procedure. Interviews took place via four e-mails and two telephone calls. The participants responded to open-ended research questions through written responses to e-mail and verbally on the telephone. The identity of the participants was anonymous, which meets the requirements of qualitative research as advised by Creswell (2003). The software programs to control and collect the data were Microsoft Word and Microsoft Access (Hahn, 2008).

Data analysis. Participants' responses to the interview questions contained data relevant to the research questions. I performed multilevel research coding to organize and explore the raw interview data, and then distilled it into multiple levels to "create scientifically acceptable conclusions" (Hahn, 2008, p. 1). Qualitative coding organized data into multiple levels: level 1 coding (i.e., initial coding or open coding to reduce qualitative data to a manageable concentration); level 2 coding (i.e., focused coding to develop categories, deeper focus, and refinement of level 1 coding); level 3 coding (i.e., axial/thematic coding); and level 4 coding (i.e., providing rich contributions to the research question) (Hanh, 2008).

To provide research precision and structural organization between coded data, the investigator developed a sequence of qualitative coding linking the retraceable steps of the investigation using Microsoft Access 2013 (Hahn, 2008). The researcher grouped level 2 codes sequentially and analyzed them by hand in the development of level 3 (axial/thematic) codes. The repeating of the process of grouping and refinement of level 3 codes contributed to the creation of level 4 codes. Microsoft Access software produced level 1 and level 2 codes. However, level 3 and level 4 were refined by systematic manual sorting of progenitor coding.

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Creswell (2003) and Hahn (2008) suggested a step-by-step approach to coding. Researcher attention to this process ensured sequencing, comprehensive protocol, validity, reliability, consistency, and accuracy of research findings. A convergence was evident between the participant transcripts and elements of the coding process (Creswell, 2003). Other data sources (e.g., the literature review, phase one research findings, six interviews, reader perspectives, and investigator experiences) offered justification/triangulation for the accuracy of research. Phase two (six interviews) revealed emotions, thought processes, and perspectives that were unavailable in the content analysis' "mute evidence" of unorganized text, data, and number counts (Hodder, 1994, p. 155).

Chapter Four: Results

Phase One: Content Analysis

The researcher processed and analyzed the coded themes/independent variables based on frequency/occurrence/relevancy to IPE and frequencies (%) of other codes. The frequencies (see Table 2) demonstrated the lack of importance of patient safety and medical error prevention in the IPE website curriculum data/text. The table shows the numerical meanings of the categories and assertions. Inferential conclusions were based on interpretations of the data. Coded independent variables were assigned to data collected from the IPE websites and analyzed data from rendered themes in the literature review.

Content analysis of the data illustrated the link between the literature review, data/text, coding, and inferences, all of which theoretically connected to the research questions. Categories of expanded lists of codes and frequencies revealed a *patient safety* count of 218, (F) 2.60%, and an *errors* count of 238, (F) 2.90%. The combined count of *patient safety* and *teamwork* had a count of 362 and frequencies of (F) 4.30 %.

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Table 2

Categories of Expanded Lists of Codes and Frequencies: QDA Miner 4

| Category | Code | Count | % Codes | Cases | % Cases |
|----------|----------------------|-------|------------|-------|---------|
| IPE | collaborate | 38 | 0.50% | 1 | 100.00% |
| IPE | collaborates | 4 | 0.00% | 1 | 100.00% |
| IPE | collaboration | 15 | 0.20% | 1 | 100.00% |
| IPE | communication | 423 | 5.10% | 1 | 100.00% |
| IPE | costs | 78 | 0.90% | 1 | 100.00% |
| IPE | culture | 114 | 1.40% | 1 | 100.00% |
| IPE | curricula | 85 | 1.00% | 1 | 100.00% |
| IPE | curriculum | 1007 | 12.20% | 1 | 100.00% |
| IPE | diverse | 84 | 1.00% | 1 | 100.00% |
| IPE | diversity | 107 | 1.30% | 1 | 100.00% |
| IPE | education | 3470 | 41.90% | 1 | 100.00% |
| IPE | environment | 163 | 2.00% | 1 | 100.00% |
| IPE | errors | 238 | 2.90% | 1 | 100.00% |
| IPE | ethical | 55 | 0.70% | 1 | 100.00% |
| IPE | ethics | 68 | 0.80% | 1 | 100.00% |
| IPE | injuries | 22 | 0.30% | 1 | 100.00% |
| IPE | motivation | 31 | 0.40% | 1 | 100.00% |
| IPE | quality patient care | 50 | 0.60% | 1 | 100.00% |
| IPE | simulation | 826 | 10.00% | 1 | 100.00% |
| IPE | simulations | 46 | 0.60% | 1 | 100.00% |
| IPE | stress | 74 | 0.90% | 1 | 100.00% |
| IPE | team | 928 | 11.20% | 1 | 100.00% |
| IPE | teamwork | 144 | 1.70% | 1 | 100.00% |
| IPE | patient safety | 218 | 2.60% | 1 | 100.00% |

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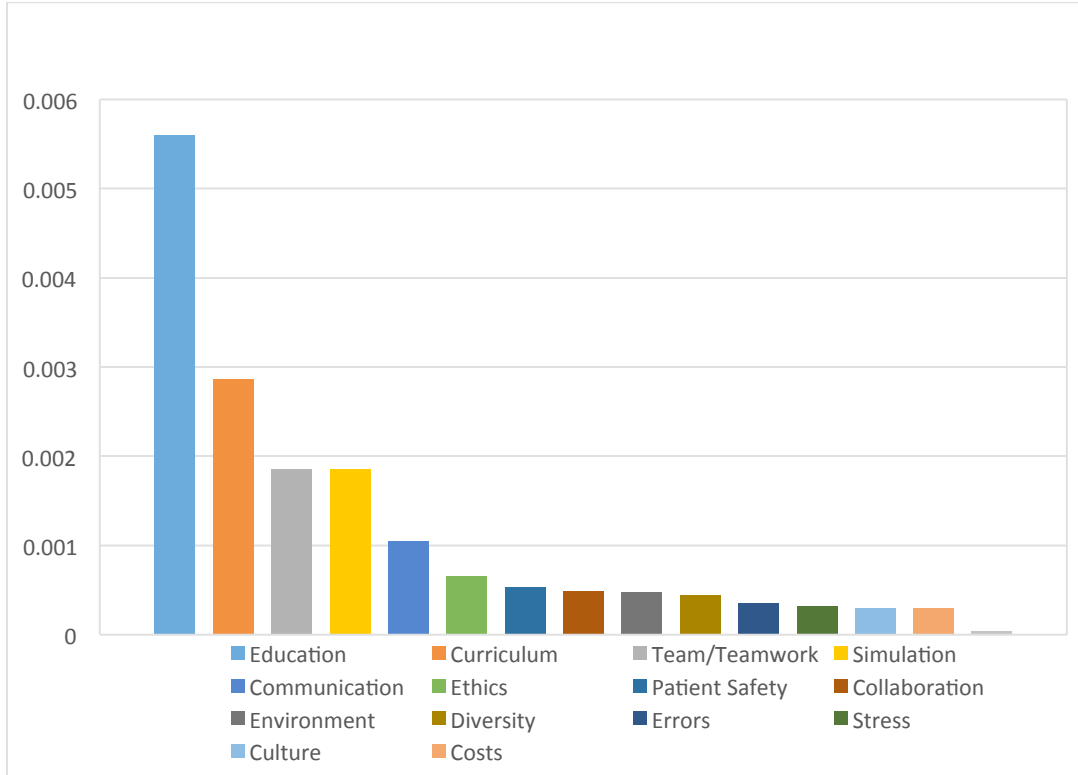


Figure 2. Frequency bar chart. Each color in the bar graph represents the frequency of the code or independent variable in the research data. The most common themes are on the left; the least common are on the right. Patient safety is 7th from the left, medical errors are 11th, and team/teamwork is 3rd.

Patient safety was 7th, teamwork 9th, and errors ranked 6th from the top of the coded variables (see Table 2). Content analysis demonstrated that patient safety's frequency/importance was 2.60%. QDA Miner 4's distribution of keywords revealed *medical error prevention* was 97.1% less important/frequent than the remaining independent variables combined. However, the combined frequencies of patient safety,

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errors, and teamwork resulted in frequencies of (F) 7.20. Figure 3 shows a visual representation of the frequencies (F) of patient safety and errors.

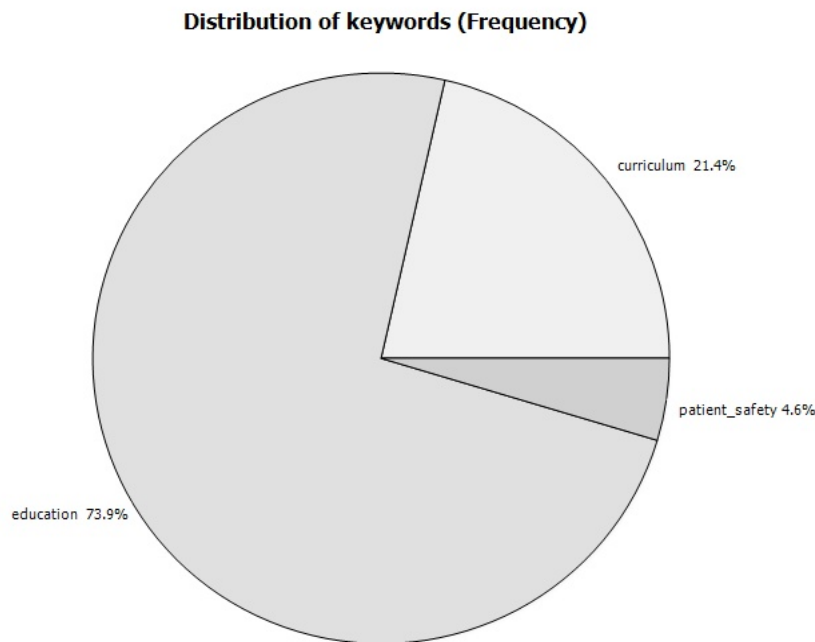


Figure 3. Pie chart demonstrating comparative frequencies of IPE. Visual interpretation of independent variables, patient safety, and education.

Eigenvalues. Chart and axial coordinates for the co-occurrences of teamwork and patient safety represent the frequency of *teamwork and patient safety* when they appear next to each other, in the same sentence, possible embedment together, or share meaning (Krippendorff, 2004). More details appear in Appendix P.

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Co-occurrence Matrix

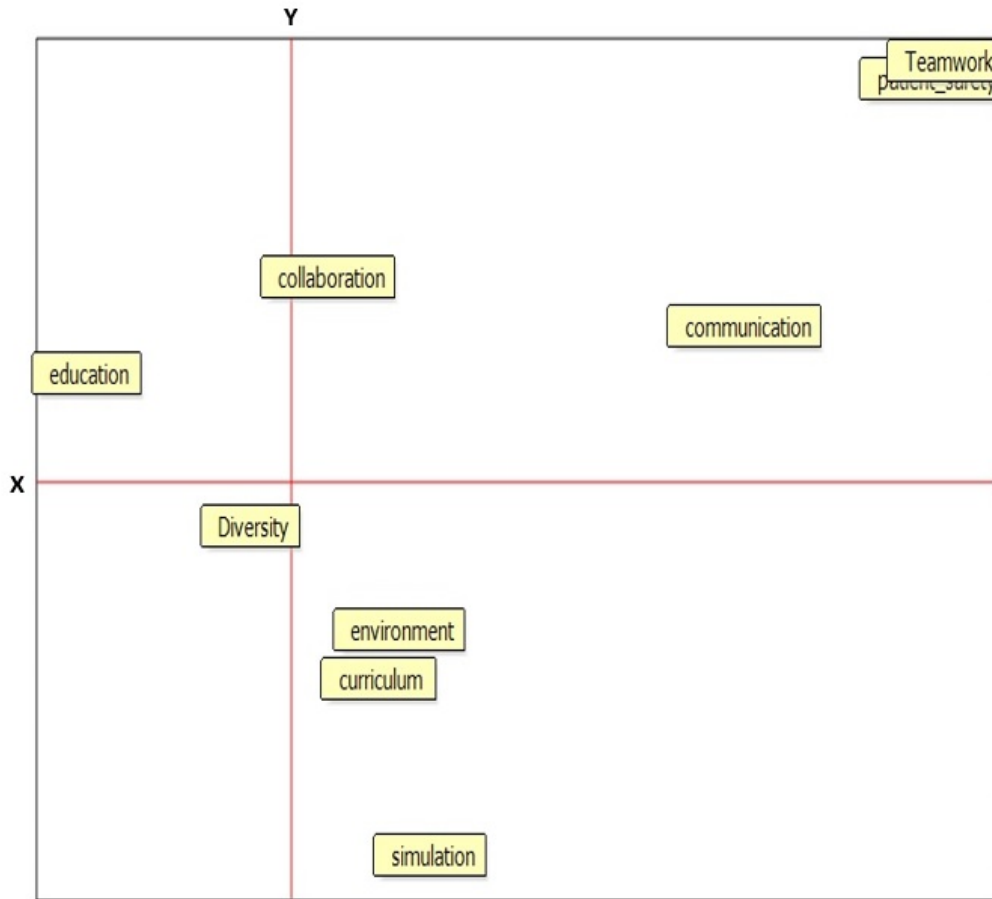


Figure 4. Pearson's r co-occurrence of independent variables: patient safety and teamwork in QDA Miner 4 (see Appendix P).

Teamwork and patient safety show similar co-occurrence. The combined value of patient safety and teamwork is described in the discussion chapter.

Alternative hypothesis. An alternative hypothesis for the lowered frequency of patient safety in IPE in pre-certification medical school was that patient safety was embedded in teamwork. According to the research data, team and teamwork were the

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primary focus of IPE. Reeves et al. (2010) suggested that *team* and *collaboration* had deeper immersion in pre-certification and post-certification education. However, Figure 4 shows co-occurrence or positive relationship between patient safety, teamwork, and curriculum. QDA Miner identified that these themes appeared often within the same sentences, inferring these themes positively supported each other in a positive direction.

Phase Two: Interviews

Two participants were a part of the original interviews to provide supplementary data regarding the research questions. Four additional participants provided more in-depth data for the qualitative investigation. Subsequently, I arranged these data according to themes, the interview question/s, and a discussion of coding. In response to open-ended questions, the six participants shared perspectives on patient safety education. The participants cognitively explored their perspectives of the interview questions bounded by the research questions.

Theme 1 was patient safety embedded in IPE coursework (Level 2). Participant 5 explained, “Other topics like hand washing hygiene and medical error disclosure are topics in the IPE course.” The subject of patient safety was unexpressed, but present, within coursework considered by IPE professionals as paramount. As evident in phase one of this research (co-occurrence), patient safety was embedded in teamwork, because team and teamwork were the principal emphases of IPE. The themes represented meanings in the interview data regarding participants’ perspectives on patient safety in IPE coursework.

Participants explained their perceptions of IPE patient safety curricula and what parts they felt responsible for providing. “All of it. We are responsible to train competent,

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safe entry level general practitioners and this is a fundamental part of our accreditation process” (Participant 1). “All of the course, which is built on a foundation of professionalism and communication” (Participant 2). However, when participants responded to questions requiring the specific discussion of patient safety, they provided nonspecific answers.

Participants gave nonspecific responses to direct interview questions about patient safety when asked about the relevancy and presence of patient safety in IPE courses. When asked if there is a certain amount of patient safety units required, Participant 4 responded that “there is no specific requirement, it is integrated in every course and in every aspect of what we do in patient care” (Supplement A). In reference to the research questions, Participant 4 stated, “So that's kind of a general question, anything that has to do with the work we do to provide information about any kind of care the patient has to include patient safety” (Supplement A).

In order to determine the legitimacy of patient safety as a course, the examination of course units were, “requiring a nonspecific number of hours” (Level 1) (Participant 3 Supplement A) and “requiring non-specific units exposure of patient safety education” (Level 1) (Participant 4 Supplement A). The participants explained how many patient safety units were in the entire IPE course. The responses included “I don't know” (Participant 3 Supplement A) and “We don't have it divided up into a unit, it's already integrated” (Participant 4 Supplement A). The investigation disclosed a shared meaning between *integration* and *embedding* of information into the teaching process of IPE. Participant 5 stated that “embedding [is] not clear, having patient safety in the most simple to complex processes” of learning (Level 1) (Supplement B). According to

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Participant 6, “[they] are bound to meet the standards of the Commission on Dental Accreditation (CODA) and in our hospital clinic to meet certifying agency standards”.

Theme 2, barriers to teaching IPE/patient safety (Level 2), and theme 3, competition with other disciplines (Level 1), shared root thematic meanings. The participants provided perspectives on what constraints prevent the teaching of patient safety at the pre-certification level of IPE. The coding process evolved from the interview question: what are some of the barriers to addressing patient safety in your IPE curriculum? The barriers to teaching IPE appeared internal in origin; external impediments such as university policies and accreditations were not of concern.

In reference to barriers to patient safety, themes captured during the coding included: “time constraints,” “scheduling among the various schools” (Participant 1), and “time and resources” (Participant 2). However, more in-depth investigation revealed different perspectives toward time constraints as a barrier in IPE, as adamantly expressed by “Not from my view” (Participant 5 Supplement B) and “Never” (Participant 6 Supplement 6). Participants also shared, “There is sufficient time to teach patient safety, being constrained by time does not interfere in teaching patient safety” (Level 1) (Participant 5 Supplement B) and “Having plenty time to teach patient safety, timing constraints never happen” (Level 1) (Participant 6 Supplement B). Time is not a barrier to patient safety education in IPE.

Theme 4, IPE was resource dependent (Level 3), revealed an uneven distribution of resources that resulted in competition between disciplines, professional superiority, and cross-discipline status/influence. The interview question was: what are some of the barriers to addressing patient safety in your IPE curriculum? The Level 1 data included

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themes of “competing with core studies” (Participant 1) and “competing with core disciplines” (Participant 2). Both participants worried about the predictability of availability of patient safety courses and the continuation of IPE programs.

Patient safety and medical error prevention in IPE has yet to become stable in medical school education. Further exploration revealed that resource availability was dependent on value returned. “Challenging time constraints and resource shortages exist, not barriers” (Level 1) (Participant 5 Supplement B). As an explanation for why resource availability was not a problem, Participant 6 stated “Having patient safety as a worthy program for resources (use), and resources are based on worthiness of the program” (Level 1) (Supplement B). Resource availability for IPE will remain positive if IPE is “Staying ahead of patient safety education, improving through evaluating” (Level 1) (Participant 5 Supplement B). A way to stay ahead is “Relying [of] on-line teaching and patient safety modules” (Level 1) (Participant 5 Supplement B).

Theme 5, positioning IPE and traditional interdisciplinary education, was critical (Level 3). To be successful, IPE and traditional interdisciplinary medical education must complement each other. The idea source for the coding was the following interview question: when it comes to patient safety, what are the strengths of your program? The weaknesses? When responding to questions about patient safety and the embedding/teaching construct, Participant 1 and Participant 2 expressed confident perspectives on patient safety and IPE. Sub-themes from the interview question included:

Level 1: Suggesting strength of patient safety comes from embeddedness/strengths (Participant 1)

Level 1: Having no weakness as a theme/weakness (Participant 1)

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Level 1: Having open and engaged students/strengths (Participant 2)

Level 1: Having no clinical experience/weaknesses (Participant 2)

Participant 2 felt that having no clinical experience was a weakness. Yet, opportunities for patient safety existed between strength/embeddedness, no weakness, and no clinical experience in patient safety. However, participants provided no firm answers in response to the interview question regarding strengths or weaknesses of their program.

In contrast to magnifying patient safety in IPE (Level 4), Participants 1, 2, 3, and 4 demonstrated an absence of awareness of the degree of focus on patient safety and error prevention. Patient safety and error prevention should be part of the IPE curriculum at the pre-certification level. The participants responded as though patient safety was an umbrella construct uniformly embedded throughout IPE. When asked if there were additional steps needed in IPE, Participant 6 stated “I believe we are providing the requisite information and training to assure excellence in patient safety” (Supplement B), and “reaching education goals in patient safety” (Level 1).

Chapter Five: Discussion

Introduction

The purpose of this qualitative research study was to explore the research questions regarding the importance of patient safety and medical error prevention in pre-certification interprofessional curriculum? As a result of this research process, recommendations for future research in this chapter may increase exposure to patient safety and error prevention in IPE at the pre-certification level in medical schools. This study included two research methods: content analysis (phase one) and interviews (phase two with two additional supplements). In this chapter, the discussion of the findings will relate to present scholarly literature, limitations, implications, and potential future research.

Phase One: Content Analysis

Out of sight; out of mind. The topic of patient safety was not present in all curricula. Eisner (1985) suggested that patient safety and error prevention were part of the IPE null curriculum (p. 97). According to Eisner (1985), the themes of patient safety and medical error reduction could either be forgotten or viewed as of less importance. With Eisner's prediction in mind, this chapter provides a chronological discussion of the qualitative research discoveries related to the research questions: is patient safety and medical error prevention important to pre-certification IPE curriculum; is patient safety and medical error prevention embedded during pre-certification IPE?

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Positive outcomes were anticipated in IPE that emphasized patient safety and medical error prevention at the pre-certification level of medical education. However, according to the content analysis of college website data (Table 2), patient safety and medical error prevention were of less importance in pre-certification IPE. A gap existed in literature determining the significance of medical students' exposure at the pre-certification level to patient safety and medical error prevention education. Research revealed that 79% of IPE occurred during post-certification training, 19% occurred before certification as shared learning, and only 2% took place at both the pre- and post-certification levels (Barr et al., 2005). Barr et al. (2005) cited these statistics as evidence of the need to increase IPE earlier in students' medical training.

Coinciding with the findings, the frequency of exposure was 2.60% of the themes of IPE data from 2005-2015. The research supported that students at the pre-certification level may not learn about patient safety and medical error prevention. Pre-certification medical students have limited opportunities to receive patient safety and medical error IPE. Thus, the research questions addressed in the literature review, content analysis, and qualitative research explored whether patient safety and medical error prevention have limited importance in pre-certification IPE. This research determined: (a) patient safety and medical error prevention are not as important as other topics to pre-certification IPE curriculum; and (b) patient safety and medical error prevention are likely to be embedded during pre-certification IPE.

The literature review weighed heavily on post-certification IPE and themes other than patient safety and error prevention. The researcher revealed recurring themes in the

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literature review, web-data, content analysis, and responses to interviews. The recurring themes included the following topics:

- Education
- Curriculum, curricula
- Environment
- Stress
- Motivation
- Collaborate, collaboration, collaborative
- Quality care
- Patient safety
- Ethics, ethical
- Errors
- Injuries
- Simulation, simulations
- Team, teamwork
- Diversity, diverse
- Communication
- Culture, environment
- Costs

IPE combines the above themes into the foundation of its philosophy; they are the content and contextual elements of IPE. The content analysis of a web-based search of eleven medical schools/universities' IPE programs between 2005 and 2015 included qualitative data in the form of themes and codes. The co-occurrence of two concepts, such as teamwork and patient safety, indicated the strength of associations between those concepts. In the minds of the members of a population of authors, readers, or curriculum designers, these linked concepts are critical to theory-building (Krippendorff, 2004). Patient safety was embedded in team curriculum (see Figure 4).

The results of the analysis revealed patient safety ranked 7th from the top of the coded variables with other subject's preceding. Content analysis using QDA Miner 4 demonstrated that patient safety's frequency/importance was 2.60%, and the frequency/importance of the remaining independent variables were 97.4%. QDA Miner

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4's distribution of keywords revealed *error* (at 2.90% frequency) was 97.1%, which was of less important than the remaining independent variables combined. The combined frequencies of patient safety, errors, and teamwork was 7.20%.

The contribution of this study was to fill the gap in the present IPE literature in determining the importance of patient safety and medical error prevention at the pre-certification level. By understanding the importance of patient safety and medical error prevention at the formative pre-certification stage, the likelihood of the continuation of patient safety and medical error prevention training in post-certification behavior and practice may increase. Understanding the significance of patient safety and medical error prevention at the formative stages of medical school may lead to a culture of safety for everyone in the healthcare community (Cottrell, 2012; Gomez, 2014; Kohn et al., 2000).

These conclusions address the exposure of pre-certification IPE students to patient safety and medical error prevention. The content analysis of the data suggests student exposure to patient safety (2.6%) and error prevention (2.9%) do not provide an environment (2.0%) capable of creating a culture (1.4%) that is beneficial to everyone involved in the healthcare community (Figure 4). By manipulating the themes/codes with content analysis, metrics could increase control of IPE outcomes.

In summation, this research exposed the frequency of patient safety and medical error in IPE website communication. The frequency of a subject indicates the importance of that subject within a defined group of objects, words, and communications. The exploration of the themes of the literature review lead to insights into current approaches to IPE. In agreement with Thistlethwaite et al. (2015), this investigation was a snapshot in time of the status of patient safety education and has no long-term predictability.

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Hopefully, this research can add meaningful insights to four decades of IPE research that has yet to demonstrate improvement in quality, cost, or experiences of healthcare.

Manasse (2009) posited that teamwork and collaboration could reduce medical accidents. However, this research showed that the themes collaborate/collaborates/collaboration and teamwork combined represent only 2.40% of the total coded independent variables of the data on IPE website communications.

Phase Two: Interviews

Theme 1 addressed awareness of patient safety in IPE. RQ1 addressed whether patient safety and medical error prevention are important in pre-certification IPE. The interview question was: what proportion of the curriculum is devoted to patient safety? After deflecting the interview question, participants shifted away from the original interview question by providing an indirect and inappropriate answer. By not responding to the original interview question, the participants revealed an absence of knowledge/clarity about the question.

The absence of awareness of the study time dedicated to patient safety (Level 1) suggested there may be no dedicated time for patient safety in IPE coursework. Participants were unable to render an approximate time frame for curriculum dedicated to patient safety. However, when asked how much time is allocated for patient safety, the participants' responses to the interview question were as follows: "All of it. We are responsible to train competent, safe entry level general practitioners and this is a fundamental part of our accreditation process" (Participant 1); "All of the course which is built on a foundation of professionalism and communication" (Participant 2). Participants

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responded as though patient safety was an umbrella-like construct embedded throughout IPE.

RQ2 addressed whether patient safety and medical error prevention are embedded during pre-certification IPE. Theme 2, patient safety was embedded in IPE coursework (Level 2), appeared within coursework considered to be central by IPE professionals. The participants readily expressed concepts in IPE courses, such as collaboration, team, and teamwork, implying the presence of patient safety as an independent topic of IPE coursework. In depth coding revealed that participants expressed a need for patient safety as a stand-alone course, because the course was embedded in IPE offerings.

According to the data, patient safety was embedded in teamwork; team and teamwork were the principal emphases of IPE. Participants reported feeling responsible for patient safety being embedded in “all of it,” all training (Participant 1) and “all of the course” (Participant 2). It is unrealistic that all IPE coursework includes patient safety and medical error prevention.

Theme 3, barriers to teaching IPE/patient safety (Level 2), was sourced from perspectives bounded by the research questions. The participants provided perspectives on constraints to teaching patient safety at the pre-certification level of IPE. Later refinements of the coding evolved from the interview question: what are some of the barriers to addressing patient safety in your IPE curriculum? The participants focused on barriers to teaching patient safety, such as the absence of time, space, and funding. Themes captured during the coding of the barriers to teaching patient safety included: “time constraints,” “scheduling among the various schools” (Participant 1), and “time and resources” (Participant 2). Time was not a constraint indicated by Participant 5, who

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stated “not from my view,” or Participant 6. Participant 5 viewed barriers as “challenges, not barriers.”

Theme 4, IPE was resource dependent (Level 3), reflected uneven distribution of resources that resulted in competition between disciplines. The interview question was: what are some of the barriers to addressing patient safety in your IPE curriculum? Responses included: “competing with core studies” (Participant 1) and “competing with core disciplines” (Participant 2). This revealed another axial coupling with IPE resource dependency. Participants were uncertain about predicting the availability of patient safety courses and the continuance of IPE programs.

Theme 5, positioning IPE and traditional interdisciplinary education was critical (Level 3), supported the idea that to be successful, IPE and traditional interdisciplinary medical education must complement each other. The interview question was: when it comes to patient safety, what are the strengths/weaknesses? Participants 1 and 2 expressed confident perspectives on patient safety and IPE as evidenced by sub-themes: the strength of patient safety comes from embeddedness/strengths (Participant 1), no weakness as a theme/weakness (Participant 1), having open and engaged students/strengths (Participant 2), and absence of clinical experience/weaknesses (Participant 2). From the participants’ perspectives, opportunities for patient safety’s viability were in flux within IPE, existing somewhere between strength from embeddedness to weakness due to lack of clinical experience for pre-certified. Participant 2 felt that having no clinical experience was a weakness.

Rationale/Benefit for Qualitative Research

The knowledge claim for this research was that patient safety and medical error prevention was of less importance in pre-certification IPE curriculum. Due to a lack of focus on patient safety and medical error prevention education, patient safety and medical error prevention are not embedded in pre-certification IPE. Due to the absence of early exposure to patient safety and medical error prevention, healthcare students at the pre-certification level are unlikely to positively influence provider behavior and patient outcomes at the post-certification practice level.

This research differs from prior research in that this research provides six perspectives on patient safety and medical error prevention. Data analysis emerged through investigation of websites and from interviews with IPE professionals. The unexpected finding was that patient safety and medical error prevention in IPE depend on resource availability and cross-discipline competition. Freeth et al. (2005) proposed time constraints and resource shortages as core barriers to IPE curriculum development. IPE struggles for relevancy in traditional cross-discipline healthcare education. The research findings clearly demonstrate conflicting results. Participants' support for patient safety and medical error prevention was evident, but none out of the six interviewees knew the percentage of patient safety instruction evident in IPE curriculum.

Future research. IPE teaching institutions may benefit from knowing the percentage of time IPE students experience patient safety and medical error prevention curriculum. IPE patient safety and medical error prevention metrics could reduce accidents and deaths in post-certification practice. This research focused on the instructors' interpretation of exposure of students to patient safety and medical error

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prevention. However, post-certification professionals could benefit from research designed to determine the impact of IPE on current practice.

Limitations. A limitation of this study was the small number of participants. A greater number of participants would provide greater range and depth of perspectives. Content analysis was a purely descriptive method of frequencies of patient safety. However, content analysis did not describe the underlying motives, depth, or quality of IPE teaching.

Strengths of research. The in-depth exploration of research questions added important new knowledge regarding instructors' perceptions of IPE curricula. The data emerged from human experience; analysis addressed the feelings of the participants about the research questions. By combining the coding techniques of the interview data with content analysis, the research sensitivity and complexity of the study improved. Finally, the step-by-step process of developing the interviews provided validity and rigor for the qualitative research. As future research, when followed by learning assessments, content analysis and interviews can determine the results of increased exposure to IPE.

Key message. IPE professionals may benefit from knowing the percentage of patient safety and medical error prevention classes in pre-certification medical training. Such metrics determine pre-certification students' exposure to patient safety and medical error prevention. IPE may reduce patient accidents and medical errors in practice. These metrics of student exposure could gauge the potential effects of such training on post-certified professionals' behavior. This qualitative research study revealed: (a) patient safety and medical error prevention are unimportant to pre-certification IPE curriculum;

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and (b) patient safety and medical error prevention are unlikely to be embedded during pre-certification IPE due to lack of IPE focus.

Conclusions

The research revealed that patient safety had a frequency of 2.60% on medical school websites. None of the six interview participants mentioned simulation (simulation counts 826), (F) 10.00%, and simulations 46, (F) 0.60%, which were the fourth most commonly mentioned themes after education, curriculum, and team. However, the information gleaned from the literature review and interviews suggested that the weakness of patient safety and medical error within IPE programs was due to a lack of resources and time. Participants in this research, however, did not believe time was a constraint in teaching patient safety in IPE. The research exposed the absence (reduced frequency/importance) of the words patient safety in IPE literature, IPE website data, and in the six interviews. The six participants were unaware of an absence of specificity of patient safety in IPE curriculum.

The majority of patient safety and medical error prevention IPE occurs at the post-certification level and is hospital-directed, motivated by hospital accreditation. Figure 4 shows, according to QDA Miner 4, that teamwork and patient safety had high levels of co-occurrence. Again, patient safety was embedded in the teamwork theme through strength of associations. Evidently, patient safety and teamwork classes are often close to each other in the data on IPE websites. There is little distinction between patient safety, teamwork, and collaboration in IPE. Krippendorff (2004) revealed the push toward collaboration by CAIPE (2005) and Meads et al. (2005) during the time of this literature review, 2005 to 2015. Collaboration could influence the outcome of the present

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research data (i.e. collaborate (0.50%) and collaboration (0.20%) codes). This may influence the answer to the research question regarding patient safety and medical error prevention's importance in pre-certification IPE.

From a business perspective, the content analysis revealed that organizations should monitor philosophical and strategic changes over time by analyzing their internal and external communications, text, and data. The content analysis reviewed IPE themes across IPE research, pre-certification IPE programs, and IPE websites. The use of descriptive metrics of content analysis may guide IPE professionals toward equitable and balanced IPE instruction. The proper distribution of IPE themes across all levels of patient care and implementation at the pre-certification level may result in greater patient safety and medical error prevention. IPE research, public communication, and reflection by pre-certification medical students may further investigations on the reduction of hospital deaths and medical errors and determine the long-term effects of IPE at the pre-certification level.

Future content analyses could investigate institutional communication, text, and data to determine alignment of institutional data, communication with the public, and the institution's internal vision and mission. Content analysis could ensure a desired focus (metrics) on education themes within a specific course of study. This research spawned another research question for future exploration: does the measurable loss of focus in IPE on patient safety and medical error prevention in medical school contribute to breaches in patient safety in professional practice?

In summation, interview participants suggested patient safety and medical error prevention were embedded throughout IPE curriculum, which contradicts data showing

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patient safety and medical error prevention have less importance in pre-certification IPE. Interview data revealed that patient safety and medical error prevention, as subjects of IPE, were rarely stand-alone courses. However, patient safety and medical error prevention were embedded into other courses considered essential to pre-certification IPE. These responses positioned patient safety and medical error prevention within the IPE curriculum, but suggested patient safety and medical error prevention were of lesser importance than other courses considered essential to graduation. To reduce the number of hospital-caused deaths and accidents, patient safety and medical error prevention's importance in the formative stages of pre-certification IPE must increase. IPE may positively influence healthcare providers' behavior in practice by recognizing, reporting, and preventing patient safety breaches.

Recommendations

The IOM (1999) suggested,

...health care organizations and the professionals affiliated with them should make continually improved patient safety a declared and serious aim by establishing patient safety programs with defined executive responsibility. Patient safety programs should provide strong, clear and visible attention to safety. (p. 14).

The present study found that patient safety (2.60%) and error (2.90%) combined was (5.5%) in the eleven medical schools' IPE website data between 2005 and 2015. The answer to the research questions was that patient safety and medical error prevention are of less importance than other topics during pre-certification medical training.

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As the result of the research, the importance of patient safety and medical error prevention should increase in IPE curriculum. Pre-certification students may benefit from learning to lead when issues of patient safety and medical error prevention require leadership, and reducing hospital circumstances like those presented in shocking reports such as *To Err Is Human* (IOM, 1999). Finally, patient safety and medical error prevention should be standalone courses.

Future Research

The research method of the present study was content analysis, rendering inferences and counts, and qualitative interviewing. A more comprehensive study of the impact of patient safety and medical error prevention IPE on pre-certification students' professional outcomes may be beneficial in the future. A majority of IPE research and training occurs at the post-certification level. This education is often hospital-directed and unidirectional to fulfill the requirements/goals of accreditation. Usually, a single individual or company presents information regarding change. Sharing of information between pre-certification and post-certification learners regarding patient safety and medical error prevention is essential. Research should be multidirectional, transparent, and fluid among all stakeholders. Therefore, patient safety and medical error prevention should be common topics within hospital environments. Cultures with high degrees of patient safety and medical error prevention may result from such increases in awareness and training. Future study could examine the impact of IPE safety training on patient safety outcomes.

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Appendices

Appendix A: Glossary

| <u>Term</u> | <u>Definition</u> |
|------------------------------|---|
| Didactic learning | the art of learning/teaching by lectures |
| Discourse | communication of thoughts and meanings by words |
| Inference | the process of arriving at some logical consequence through a series of assumed premises |
| Inter-professional education | learning that occurs when professionals of diverse disciplines share knowledge cross discipline |
| Intervention | learning focused on initiating a different, new, and changed behaviors |
| Neuroscience | fields of scientific study encompassing the various disciplines of the nervous system |
| Postcertification | after certification has occurred, as licensing or holding credentials in a discipline |
| Postprofessional | after having a license or credential in a discipline |
| Pre-certification | training before a license or credential is given, student |
| Preprofessional | training before awarded a license or credential, student |
| Typology | systematic classification or study of types |

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Appendix B: Interview 1 (Participant 1)

What courses include material on patient safety? When are these courses offered during the program?

IPE 701 University Course, Fall, Winter and Spring Terms DS 1

DEN 730 Comprehensive Care Fall, Winter and Spring Terms DS 1

DEN 740 Comprehensive Care Fall, Winter and Spring Terms DS 2

OS 722 Spring Term DS 2

DEN 754 A, B, C, D Summer, fall, Winter Spring Terms DS 3

DEN 756 A, B, C, D Summer, fall, Winter Spring Terms DS 4

How safety material is taught (cases, lecture, readings, and guest speakers)?

Case based presentations and group discussions

Some lecture in OS

How proportion of the curriculum is devoted to patient safety?

All of it. We are responsible to train competent, safe entry level general practitioners and this is a fundamental part of our accreditation process.

When addressing patient safety, what specific topics are covered?

Communication, examination, diagnosis, treatment planning, treatment, and outcomes assessment

When it comes to patient safety, what are the strengths of your program? The weaknesses?

It is a constant theme of all parts of our educational process.

What are some of the barriers to addressing patient safety in your IPE curriculum?

Time constraints

Scheduling among the various schools

Appendix C: Interview 2 (Participant 2)

What courses include material on patient safety? When are these courses offered during the program?

We are using the IHI modules (www.IHI.org) for patient safety basic content. The modules are numbered PS102, PS103, PS105, and PS201.

How safety material is taught (cases, lecture, readings, and guest speakers)?

The modules are to be read prior to our IPE sessions.

How proportion of the curriculum is devoted to patient safety?

All of the course which is built on a foundation of professionalism and communication.

When addressing patient safety, what specific topics are covered?

Course objectives:

1. Demonstrate the ability to participate effectively as a member of an interprofessional team in activities that improve the safety and quality of health care.
2. Demonstrate active listening and oral and written communication skills with diverse individuals, communities, and colleagues to ensure effective, culturally appropriate exchange of information.
3. Develop skills to communicate with patients' families, communities, peers, and other health professionals in a responsive and responsible manner that supports an interprofessional approach that ensures an effective, culturally appropriate exchange of information.
4. Demonstrate knowledge of codes of ethical conduct for multiple professions and assess for similarities and differences.
5. Work with individuals of other professions to enhance a climate of mutual respect and shared values.
6. Place the interests of patients and populations at the center of health care delivery
7. Demonstrate knowledge of team-based professional skills, roles, and responsibilities in order to ensure an environment for safe, efficient, effective, and equitable care.

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8. Use the knowledge of one's own role and those of other professions to appropriately assess and address the health care needs of patients and populations
9. Apply relationship-building values and the principles of team dynamics to perform effectively in team roles to prepare for patient/population-centered care that is safe, timely, efficient, effective, and equitable.
10. Demonstrate the ability to identify situations that compromise safety and participate in risk reduction and CQI.
11. Describe one's own role and responsibility for and commitment to improve *patient safety* and system performance.
12. Demonstrate the ability to work within an interprofessional healthcare team to identify, analyze, and communicate appropriately about errors, and propose system improvements to reduce them.

When it comes to *patient safety*, what are the strengths of your program? The weaknesses?

Strengths are the interprofessional approaches with new learners who are open and engaged. Weaknesses would be the gap in when they can apply in a clinical setting.

What are some of the barriers to addressing *patient safety* in your IPE curriculum?

Time and resources.

Appendix D: Permission

Dear Ed Ward,

Thank you for your request. You can consider this email as permission to use Figure 4.1 and 4.9 from the Krippendorff title as detailed below in your upcoming dissertation. Please note that this permission does not cover any 3rd party material that may be found within the work. You must properly credit the original source, Content Analysis: An Introduction to Its Methodology, Second Edition. Please contact us for any further usage of the material.

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Appendix E: IRB

Title: The Pre-Certification Interprofessional Education:
Ideal vs. Reality Patient Safety Curriculum

Principal
Researcher(s): Edward B. Ward

Date application completed: December 12, 2016

COMMITTEE FINDING:

1) The proposed research makes adequate provision for safeguarding the health and dignity of the subjects and is therefore approved.

2) Due to the assessment of risk being questionable or being subject to change, the research must be periodically reviewed by the IRSC on a _____ basis throughout the course of the research or until otherwise notified. This requires resubmission of this form, with updated information, for each periodic review.

3) The proposed research evidences some unnecessary risk to participants and therefore must be revised to remedy the following specific area(s) of non-compliance:

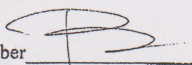
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4) The proposed research contains serious and potentially damaging risks to subjects and is therefore not approved.

Chair or designated member  Date 12/14/16

Appendix F: Interview Protocol

What courses include material on *patient safety*? When are these courses offered during the program?

How safety material is taught (cases, lecture, readings, and guest speakers)?

How proportion of the curriculum is devoted to *patient safety*?

When addressing *patient safety*, what specific topics are covered?

When it comes to *patient safety*, what are the strengths of your program? The weaknesses?

What are some of the barriers to addressing *patient safety* in your IPE curriculum?

Appendix G: Coding Document

Table 3

| <i>Coding Document</i> | |
|------------------------|--|
| 1. | Interviewer: What courses include material on patient safety? When are these courses offered during the program? |
| 2. | Locating patient safety within coursework Participant 1: IPE 701 University Course , Fall, Winter and Spring Terms DS 1 Patient safety Hidden in curriculum |
| 3. | DEN 730 Comprehensive Care Fall, Winter and Spring Terms DS 1 |
| 4. | DEN 740 Comprehensive Care Fall, Winter and Spring Terms DS 2 |
| 5. | OS 722 Spring Term DS 2 |
| 6. | DEN 754 A, B, C, D Summer, fall, Winter Spring Terms DS 3 |
| 7. | DEN 756 A, B, C, D Summer, fall, Winter Spring Terms DS 4 |
| 8. | Defining patient safety contextually or conceptually Participant 2: We are using the IHI modules (www.IHI.org) for patient safety basic content. The modules are numbered PS102, PS103, PS105, and PS201. Defining patient safety contextually or conceptually |
| 9. | Interviewer: How safety material is taught (cases, lecture, readings, and guest speakers)? |
| 10. | Learning which is action based is best Participant 1: Case based presentations and group discussions. Learning through action and immersion provides retention and depth |
| 11. | Learning which is action based is better Some lecture in OS. Lecture the poorest form of learning |
| 12. | Reading to class poor way to teach and learn Participant 2: The modules are to be read prior to our IPE sessions. Reading poor reading model |
| 13. | Interviewer: How proportion of the curriculum is devoted to patient safety? |
| 14. | Being unaware of proportion of studies is patient safety. Participant 1: All of it. We are responsible to train competent, safe entry level general practitioners and this is a fundamental part of our accreditation process. <i>Not aware of patient safety. Failing to answer proportion of patient safety taught</i> |
| 15. | Binding Building Participant 2: All of the course which is built on a foundation of professionalism and communication. <i>Binding patient safety with professionalism and communication</i> |
| 16. | Interviewer: When addressing patient safety, what specific topics are covered? |

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| 17. | <i>Cloaking patient safety within procedures</i> <i>Embedding patient safety</i> | Participant 1: Communication, examination, diagnosis, treatment planning, treatment, and outcomes assessment. Responding to patient safety procedurally not conceptually or contextually. |
| 18. | | Participant 2: Course objectives: |
| 19. | <i>Teaming to improve safety</i> <i>Participating effectively</i> | 1. Demonstrate the ability to participate effectively as a member of an interprofessional team in activities that improve the safety and quality of health care. Teaming to improve safety and quality |
| 20. | <i>Writing communicating exchanging information</i> <i>Diverse culture</i> | 2. Demonstrate active listening and oral and written communication skills with diverse individuals, communities, and colleagues to ensure effective, culturally appropriate exchange of information. <i>Listening, writing, exchanging culturally sensitive information.</i> Communication are interpersonal skills are not patient safety. |
| 21. | <i>Communicating</i> | 3. Develop skills to communicate with patients' families, communities, peers, and other health professionals in a responsive and responsible manner that supports an interprofessional approach that ensures an effective, culturally appropriate exchange of information. These are communication skills. |
| 22. | <i>Knowing codes of ethics</i> | 4. Demonstrate knowledge of codes of ethical conduct for multiple professions and assess for similarities and differences. Knowing the codes of ethical conduct appear to relate to behavior. |
| 23. | <i>Enhancing work climate</i> <i>Respecting</i> <i>Sharing values</i> <i>Collaborating</i> | 5. Work with individuals of other professions to enhance a climate of mutual respect and shared values. Work climates and values are important. |
| 24. | <i>Placing the interest on the patient</i> | 6. Place the interests of patients and populations at the center of health care delivery. Placing interest of patient at the center |
| 25. | <i>Knowing responsibilities</i> <i>Knowing environment</i> | 7. Demonstrate knowledge of team-based professional skills, roles, and responsibilities in order to ensure an environment for safe, efficient, effective, and equitable care. Team-based knowledge with an extensive scope of responsibilities |
| 26. | <i>Dealing with situations through experience</i> | 8. Use the knowledge of one's own role and those of other professions to appropriately assess and |

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| | | |
|-----|--|--|
| | | address the health care needs of patients and populations Gaining experience |
| 27. | Building values and principles <i>Growing in the profession</i> | 9. Apply relationship-building values and the principles of team dynamics to perform effectively in team roles to prepare for patient/population-centered care that is safe, timely, efficient, effective, and equitable. Building team values and principles translatable to the job and patient care. |
| 28. | Reducing risk <i>Improving quality</i> | 10. Demonstrate the ability to identify situations that compromise safety and participate in risk reduction and continuous quality improvement. Reducing risks through experience |
| 29. | Becoming impactful <i>Improving patient safety</i> | 11. Describe one's own role and responsibility for and commitment to improve patient safety and system performance. Teaching students to become impactful and improve patient safety by following protocol. |
| 30. | Reducing errors | 12. Demonstrate the ability to work within an interprofessional healthcare team to identify, analyze, and communicate appropriately about errors, and propose system improvements to reduce them. Actively participate in reducing errors within the healthcare system. |
| 31. | | Interviewer: When it comes to patient safety, what are the strengths of your program? The weaknesses? |
| 32. | Suggesting strength of patient safety comes from embeddedness <i>Having no weakness as a theme</i> | Participant 1: It is a constant theme of all parts of our educational process. Suggesting patient safety is strength due to embeddedness. Having no weaknesses. |
| 33. | Having open and engaged students. <i>Having no clinical experience</i> | Participant 2: Strengths are the interprofessional approaches with new learners who are open and engaged. Weaknesses would be the gap in when they can apply in a clinical setting. Having students who are open and engaged, Having no clinical experience. |
| 34. | | Interviewer: What are some of the barriers to addressing patient safety in your IPE curriculum? |
| 35. | Competing with core studies | Participant 1: Time constraints Core studies consume students time |

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| | | |
|-----|---|---|
| 36. | <i>Competing with core studies</i> | Scheduling among the various schools Core studies consume available space |
| 37. | <i>Competition with other disciplines</i> | Participant 2: Time and resources. Compete with other disciplines for time, space, and funding |

Appendix H: Table of Codes

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.....26

Reducing risks through experience..... 1
.....28

Teaching students to become impactful and improve patient safety by following protocol . 1.....29

Actively participate in reducing errors within the healthcare system ... 1.....30

Core studies consume students time 1
.....35

Appendix J: Hahn's Pyramid

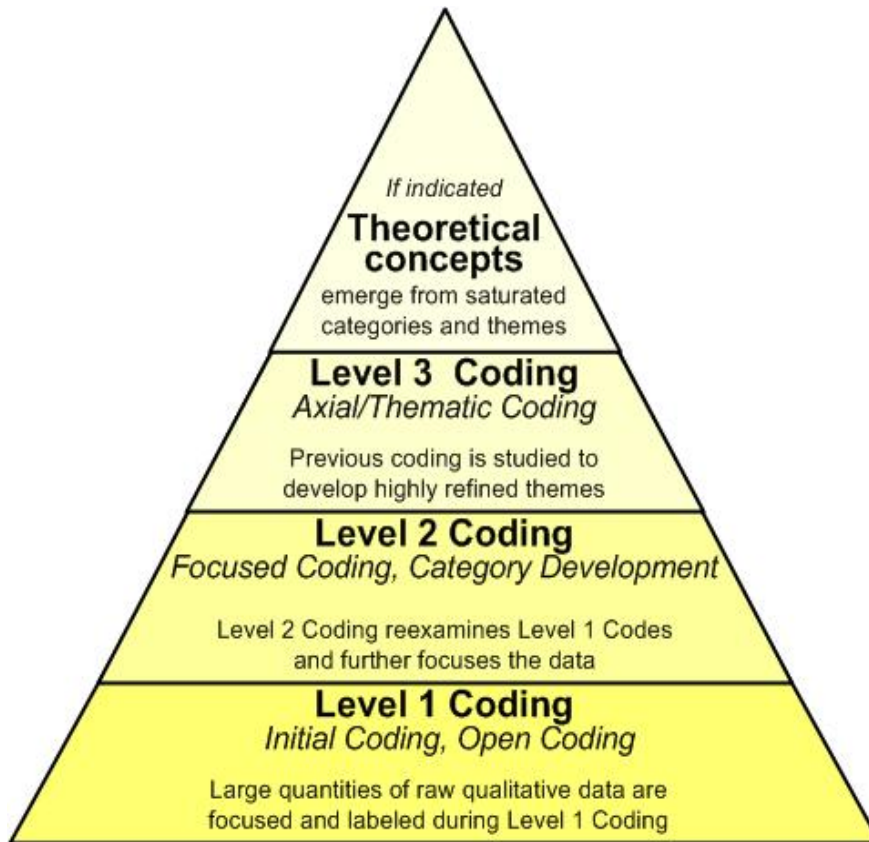


Figure 5. Hahn's pyramid. Data coded to arrive at categories, themes, and theories.

Appendix K: Research Data Control Panel A

Level (1)

The screenshot displays the 'Qualitative Research Control Panel' interface. On the left, a 'Queries' sidebar lists several queries, with 'qryTheoretical...' selected. The main panel is titled 'Enter, Edit, and Examine Data for Memos, Codes, Categories, Themes, and Theoretical Concepts'. It features several data entry sections:

- Level 1 Code from Word (e.g. initial/open code), or Memo:** Includes a text input field with the value 'Suggesting strength of patient safety Reducing errors Red', a 'Go To Record Alphabetically' button, and an 'Add' button.
- Level 2 Code (e.g. categories, focused codes):** Includes a 'Check if New' checkbox (checked), a dropdown menu with 'Patient safety embedded IPE', and a 'Refresh Form' button. A note states: 'Add a check mark when a new Level 2, Level 3, or Theoretical Concept is created (typed). For the reuse of existing codes cut and paste from gray'.
- Level 3 Code (e.g. themes, selective code):** Includes a 'Check if New' checkbox (unchecked), a dropdown menu with 'Patient safety embedded in IPE', and a 'Go To Record Alphabetically' button.
- L4 - Theoretical Concepts:** Includes a 'Check if New' checkbox (checked) and a dropdown menu with 'Magnifying Patient Safety in IPE'.
- Source of the Idea:** A text input field containing the value 'r2p1 r8p2 r14p1 r17p1 r19p2 r28p2 r30p2r32p1'.
- Raw Data Field:** A large text area with the instruction 'Paste or type text from transcripts and fieldnotes. Also use space for memo.' and the following text:
Patient safety Hidden in curriculum
Defining patient safety contextually or conceptually
All of it
Responding to patient safety procedurally not conceptually or contextually.
Teaming to improve safety and quality
Reducing risks through experience
Actively participate in reducing errors within the healthcare system
Suggesting patient safety is strength due to embeddedness. Having no weaknesses.

At the bottom, a navigation bar shows 'Record: 14', '24 of 27', and a search field.

Appendix L: Research Data Control Panel B

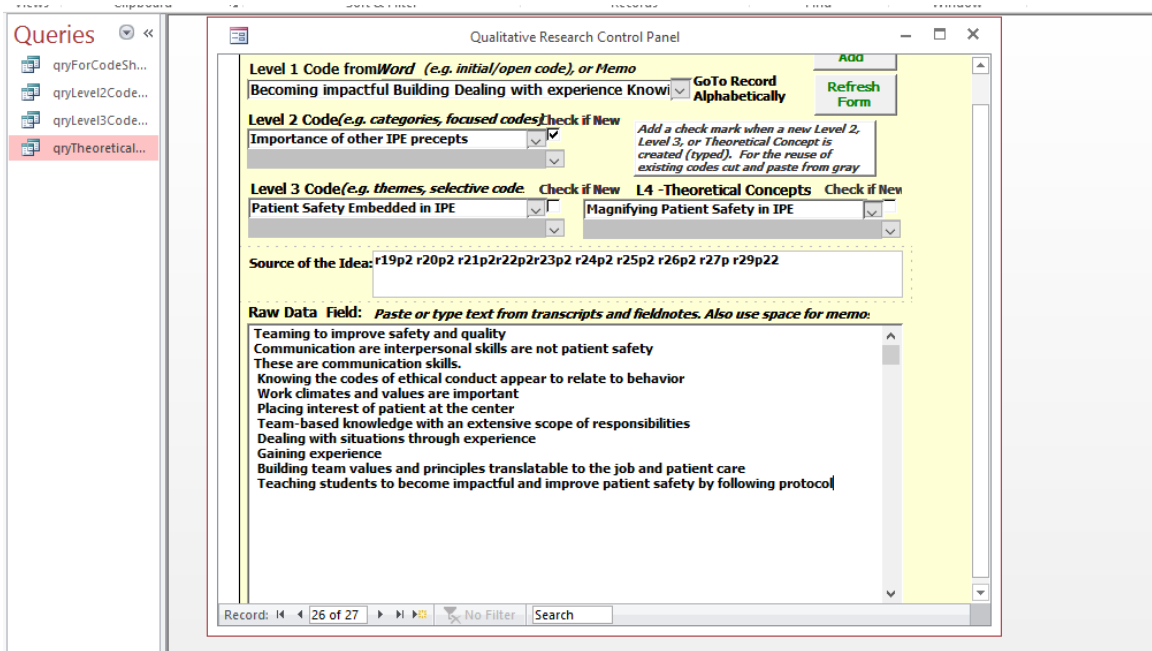
Level (2)

The screenshot displays the 'Qualitative Research Control Panel' interface. On the left, a 'Queries' sidebar lists several query types: 'qryForCodeSh...', 'qryLevel2Code...', 'qryLevel3Code...', and 'qryTheoretical...'. The main panel is divided into several sections:

- Level 1 Code from Word (e.g. initial/open code), or Memo:** Includes a dropdown menu with the selected option 'Cloaking patient safety within procedures Building Lacking' and a 'GoTo Record Alphabetically' button.
- Level 2 Code (e.g. categories, focused codes):** Includes a dropdown menu with 'IPE Philosophy teachings' and a 'Check if New' checkbox. A tooltip explains: 'Add a check mark when a new Level 2, Level 3, or Theoretical Concept is created (typed). For the reuse of existing codes cut and paste from gray'. There are 'Add' and 'Refresh Form' buttons.
- Level 3 Code (e.g. themes, selective code):** Includes a dropdown menu with 'Patient safety embedded in IPE' and a 'Check if New' checkbox.
- L4 -Theoretical Concepts:** Includes a dropdown menu with 'Magnifying Patient Safety in IPE' and a 'Check if New' checkbox.
- Source of the Idea:** A text field containing the alphanumeric string 'r2pi r8p2 r10p1 r11p1r12p2 r14p1 r15p2 r17p1'.
- Raw Data Field:** A large text area with the instruction: 'Paste or type text from transcripts and fieldnotes. Also use space for memo.' The text entered includes: 'Patient safety Hidden in curriculum', 'Defining patient safety contextually or conceptually', 'Learning through action and immersion provides retention and depth', 'Lecture the poorest form of learning', 'Reading poor reading model', 'All of it', 'Built on a foundation of professionalism and communication', and 'Responding to patient safety procedurally not conceptually or contextually.'.

At the bottom, a status bar shows 'Record: 14' of '25 of 27' items, with navigation arrows and a search box.

Appendix M: Research Data Control Panel Level (3)



Appendix N: Research Data Control Panel D

Level (4)

Qualitative Research Control Panel

Level 1 Code from *Word* (e.g. initial/open code), or Memo
Competition with other disciplines Competing with core stu Go To Record Alphabetically

Level 2 Code (e.g. categories, focused codes) Check if New
barriers to teaching IPE patient safety Add a check mark when a new Level 2, Level 3, or Theoretical Concept is created (typed). For the reuse of existing codes cut and paste from gray

Level 3 Code (e.g. themes, selective code) Check if New L4 - Theoretical Concepts Check if New
IPE resource dependent Magnifying Patient Safety in IPE

Source of the Idea: r30p2 r31p1 r33p2 r35p1 r36pi r37p2

Raw Data Field: Paste or type text from transcripts and fieldnotes. Also use space for memo:
Actively participate in reducing errors within the healthcare system.
Suggesting patient safety is strength due to embeddedness. Having no weaknesses.
Having students who are open and engaged, Having no clinical experience
Core studies consume students time
Core studies consume available space
Compete with other disciplines for time, space, and funding

Record: 14 27 of 27 No Filter Search

Appendix O: Query of Codes

Table 4

| <i>Coding Levels</i> | | | |
|--|---|---|---|
| Level 1 | Level 2 | Level 3 | Level 4: Theoretical Concept |
| <p>Competition with other disciplines</p> <p>Idea source: r30p2 r31p1 r33p2 r35p1 r36pi r37p2</p> | <p>Barriers to teaching IPE patient safety</p> <p>Idea source: r30p2 r31p1 r33p2 r35p1 r36pi r37p2</p> | <p>Positioning IPE and Traditional Medical</p> <p>Idea source: r2p1 r8p2 r14p1 r17p1 r20p2</p> | |
| <p>Reducing risk, Building values dealing</p> <p>Idea source: r2p1 r8p2 r14p1 r17p1 r19p2 r26p2</p> | <p>Belief that patient safety was a part of IPE</p> <p>Idea source: r2p1 r8p2 r14p1 r17p1 r19p2 r26p2</p> | <p>Patient safety Embedded in IPE</p> <p>Idea source: r2p1 r8p2 r14p1 r17p1 r19p2 r26p2</p> | |
| <p>Becoming impactful, Building</p> <p>Idea Source: r19p2 r20p2 r21p2r22p2r23p2 r24p2</p> | <p>Importance of other IPE precepts</p> <p>Idea source: r19p2 r20p2 r21p2r22p2r23p2 r24p2</p> | <p>Patient safety embedded in IPE</p> <p>Idea source: r2p1 r8p2 r14p1 r17p1 r19p2 r28p2</p> | <p>Magnifying Patient safety in IPE</p> <p>Idea source: r2p1 r8p2 r14p1 r17p1 r19p2 r28p2</p> |
| <p>Dealing with cloaking patient safety within procedures</p> <p>Idea source: r2pi r8p2 r10p1 r11p1r12p2 r14p1 r15p2</p> | <p>IPE Philosophy teachings</p> <p>Idea source: r2pi r8p2 r10p1 r11p1r12p2 r14p1 r15p2</p> | <p>Patient safety embedded in IPE</p> <p>Idea source: r2pi r8p2 r10p1 r11p1r12p2r14p1r15p r15p2</p> | <p>Magnifying Patient safety in IPE</p> <p>Idea source: r2pi r8p2 r10p1 r11p1r12p2r14p1r15p</p> |

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY

| | | | |
|--|--|---|---|
| Suggesting strength of patient safety | Patient safety embedded in IPE coursework | Patient safety Embedded in IPE | Magnifying Patient safety in IPE |
| Idea source: r2p1 r8p2 r14p1 r17p1 r20p2 | Idea source: r2p1 r8p2 r14p1 r17p1 r20p2 | Idea source: r19p2 r20p2 r21p2r22p2r23p2 r24p2 | Idea source: r19p2 r20p2 r21p2r22p2r23p2 r24p2 |
| Suggesting strength of patient safety | Patient safety embedded IPE | IPE resource dependent | Magnifying Patient safety in IPE |
| Idea source: r2p1 r8p2 r14p1 r17p1 r19p2 r28p2 | Idea source: r2p1 r8p2 r14p1 r17p1 r19p2 r28p2 | Idea source: r30p2 r31p1 r33p2 r35p1 r36pi r37p2 | Idea source: r30p2 r31p1 r33p2 r35p1 r36pi r37p2 |

Note. Level 1 produces level 2. The sources can show where level 1 and 2 appear in the coding document. Level 2 produces level 3, and the investigation of level 3 creates level 4. The idea sources trace each level to its evidence (origin), which the coding document verifies.

Appendix P: Eigenvalues

Table 5

| <i>Eigenvalues</i> | | |
|--------------------|-------------|-----------------|
| Eigenvalues | Percentages | Cumuli. Percent |
| 0.357 | 30.194 | 30.194 |
| 0.209 | 17.682 | 47.876 |
| 0.168 | 14.251 | 62.127 |

Note. Chart and axial coordinates for the co-occurrences of teamwork and patient safety. These values represent the frequency the words teamwork and patient safety appear next to each other, in the same sentence, possible embedment together, or sharing meaning (Krippendorff, 2004).

Table 6

| <i>Variables Coordinates</i> | | | |
|------------------------------|--------|--------|--------|
| Item | Axis 1 | Axis 2 | Axis 3 |
| Collaboration | 0.025 | 0.064 | 0.385 |
| Communication | -0.081 | 0.798 | 0.286 |
| Curriculum | -0.108 | 0.154 | -0.409 |
| Diversity | 4.408 | -0.072 | -0.105 |
| Education | -0.082 | -0.361 | 0.195 |
| Environment | 0.079 | 0.188 | -0.309 |
| Simulation | -0.115 | 0.245 | -0.756 |
| Teamwork | -0.044 | 1.151 | 0.812 |
| Patient safety | 0.053 | 1.129 | 0.773 |

Appendix Q: Telephone Interview Participant 3 Supplement A

Question:

What is meant when you say that you integrate patient safety in your course work?

That depends on several of those courses they all deal organizational systems and then the DMP project courses

Which is their last similar to a dissertation experience that the students will have.

When we talk about patients at the graduate level we are really looking at clinical monitoring

Do you have the nurses in charge of the patients?

Are they checking ... well doing a couple of things?

Checking their environment in which they are being housed to make sure that it is safe and that relates to access to a call belt

Access to a walk way that is not crowded with clinical tools, such as IV pools, etc. that might block the way.

Do you have a patient who is able to stand and walk without assistance?

And if not do you provide someone to be an assistant to that individual when they have to get up to use the toilet or go for a walk down the hall, or is there a walker that is available.

So were really looking at what's the clinical environment for making sure you've got patient safety.

With respect to doing research we're looking at whether or not the project that is being done has gone through and been approved IRB so that any research project is not going to contribute to harm to the patient or population that is going to be participating in the research study.

Yes, so in the undergraduate curriculum I know that the emphasis in every single clinical course is all about insuring patient safety.

So students have to

When they are being critiqued by their clinical faculty they have to make sure that their patient's room is safe for walking, for working, not only for the patient, but for the nurse.

So those are begun in the first clinical semester they enter the nursing program and extends in every semester there after

Question:

Is the patient safety apart of every course? Is there a certain amount of patient safety units required?

Answer:

Patient safety is a part of every clinical course that the undergraduate student takes

It will be a part of every clinical course that a nurse practitioner student takes

And it will be a part of every semester that the student does their final dissertation when they're working on a clinical project.

Question:

How much is a unit to the entire IPE course? (Percentage, all of it? Part of it?)

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY

Answer:

....in their first clinical semester. And of course within those IPE activities patient safety is a component.

IPE activities include nutrition, physician, pharmacy and nursing student. So there is an aspect of patient safety.

Now that's in semester one.

I would think that semester within that junior year, would also include it,

But I can't be sure and then where it [is] goes from there,

I don't know.

I do know that in the graduate level, on some of these IPE cases that the students have been involved in with patient safety was a critical component with the cases they did.

That patient safety was about safe environment at home and asking those pertinent questions of who do you have, what's your home environment like? Do we need to assess it?

What are those factors that contribute to patient safety especially if they are on oxygen etc.?

Appendix R: Telephone Interview Participant 4 Supplement A

Question:

What is meant when you say that you integrate *patient safety* material in your course work?

Answer:

So that's kind of a general question, anything that has to do with the work we do to provide information about any kind of care the patient has to include *patient safety*.

Question:

Is the *patient safety* apart of every course? Is there a certain amount of *patient safety* units required?

Answer:

There is no specific requirement, it is integrated in every course and in every aspect of what we do in patient care.

Question:

How much is a unit to the entire IPE course? (Percentage? all of it? part of it?)

Answer:

Unit, it's we don't have it divided up into a unit already integrated.

Appendix S: Table of Contents Participants 3 and 4 Supplement A

Table of Contents

Being taught throughout learning.....3

Shared learning experience.....4

Create Culture of Safety.....7

Safety
Practices.....8

Safety
Practices.....9

Simulations as
practice.....11

Patient safety Individual Edict.....12

Does critiquing forward patient safety.....14

Unbinding patient
safety.....15

Patient safety includes good
care.....16

Patient safety primary not secondary.....18

Patient safety preeminent subject.....19

Assess
throughout.....20

Need to know patient safety
exposure.....21

Need to know exposure to
evaluate.....22

IPE professional level of
knowledge.....24

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY

IPE professional training.....25

Awareness.....2
7

Training IPE.....28

IPE In
service.....29

IPE practice vs theory.....31

Appendix T: Coding Document Participants 3 and 4 Supplement A

Coding Document

| | | |
|-----|---|---|
| 1. | | Interviewer: What is meant when you say that you integrate patient safety in your course work? |
| 2. | | Participant 3: That depends on several of those courses they all deal organizational systems and then the DMP project courses |
| 3. | <i>Being the last major learning experience</i> <i>As students</i> Being taught throughout learning | Which is their last similar to a dissertation experience that the students will have. |
| 4. | <i>Monitoring vs learning</i> Shared learning experience | When we talk about patients at the graduate level we are really looking at clinical monitoring |
| 5. | | Do you have the nurses in charge of the patients? |
| 6. | | Are they checking ... well doing a couple of things? |
| 7. | <i>Having and environmental focus</i> Create Culture of Safety | Checking their environment in which they are being housed to make sure that it is safe and that relates to access to a call belt |
| 8. | <i>Focusing on the practical aspect of patient safety</i> Safety Practices | Access to a walk way that is not crowded with clinical tools, such as IV pools, etc. that might block the way. |
| 9. | | Do you have a patient who is able to stand and walk without assistance? |
| 10. | <i>Assisting patients as the practical of patient safety</i> Safety Practices | And if not do you provide someone to be an assistant to that individual when they have to get up to use the toilet or go for a walk down the hall, or is there a walker that is available. |
| 11. | <i>Having clinical environment as the predictor of patient safety</i> Simulations as practice | So were really looking at what's the clinical environment for making sure you've got patient safety. |
| 12. | <i>Delegating patients safety</i> <i>Emphasizing patient safety in every clinical course</i> Patient safety Individual Edict | With respect to doing research we're looking at whether or not the project that is being done has gone through and been approved IRB so that any research project is not going to contribute to harm to the patient or population that is going to be participating in the research study. Yes, so in the undergraduate curriculum I know that the emphasis in every single clinical course is all about insuring patient safety. |
| 13. | | So students have to |
| 14. | <i>Critiquing for patient safety</i> <i>Practicing patient safety assessment</i> Does critiquing forward patient safety? | When they are being critiqued by their clinical faculty they have to make sure that their patient's room is safe for walking, for working, not only for the patient, but for the nurse. |

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY

| | | |
|-----|--|--|
| 15. | <i>Extending through out</i> Unbinding patient safety | So those are begun in the first clinical semester they enter the nursing program and extends in every semester there after |
| 16. | <i>Including patient safety with care information</i> Patient safety includes good care | Participant 4: So that's kind of a general question, anything that has to do with the work we do to provide information about any kind of care the patient has to include patient safety |
| 17. | | Interviewer: Is the patient safety apart of every course? Is there a certain amount of patient safety units required? |
| 18. | <i>Attaching patient safety to every clinical course taken</i> Patient safety primary not secondary | Participant 3: Patient safety is a part of every clinical course that the undergraduate student takes |
| 19. | <i>Providing patient safety component in every course</i> Patient safety preeminent subject | It will be a part of every clinical course that a nurse practitioner student takes |
| 20. | <i>Assessing patient safety as a completion goal</i> Assess through out | And it will be a part of every semester that the student does their final dissertation when they're working on a clinical project. |
| 21. | <i>Requiring a nonspecific number of hours</i> Need to know patient safety exposure | There is no identification of a specific number of hours related to patient safety |
| 22. | <i>Requiring non-specific units exposure of patient safety education</i> Need to know exposure to evaluate | Participant 4: There is no specific requirement, it is integrated in every course and in every aspect of what we do in patient care |
| 23. | | Interviewer: How much is a unit to the entire IPE course? (Percentage, all of it? Part of it?) |
| 24. | <i>Embedding patient safety within IPE courses</i> IPE professional level of knowledge | Participant 3:in their first clinical semester. And of course within those IPE activities patient safety is a component. |
| 25. | <i>Seeming unclear as to student exposure to patient safety</i> IPE professional training | IPE activities include nutrition, physician, pharmacy and nursing student. So there is an aspect of patient safety. |
| 26. | | Now that's in semester one. |
| 27. | <i>Timing of patient safety courses were unclear</i> Awareness | I would think that semester within that junior year, would also include it, |
| 28. | <i>Failing to know how patient safety integrated into IPE</i> Training IPE | But I can't be sure and then where it [is] goes from there, |
| 29. | <i>Showing unawareness of how patient safety impacts the IPE</i> | I don't know. |

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY

| | IPE In service | |
|-----|---|--|
| 30. | <i>Acknowledges that patient safety education impacts post certification IPE</i> | I do know that in the graduate level, on some of these IPE cases that the students have been involved in with patient safety was a critical component with the cases they did. |
| 31. | <i>Confusing patient safety practice and patient safety theory</i> IPE practice vs theory | That patient safety was about safe environment at home and asking those pertinent questions of who do you have, what's your home environment like? Do we need to assess it? |
| 32. | | What are those factors that contribute to patient safety especially if they are on oxygen etc.? |
| 33. | <i>failing monitor students' exposure to patient safety</i> | Participant 4: We don't have it divided up into a unit, it's already integrated. |

Appendix U: Level One Codes Participant 3 and 4 Supplement A

Level One Codes

| | |
|---|----|
| Acknowledges that patient safety education impacts post certification IPE | 30 |
| Assessing patient safety as a completion goal | 20 |
| Assisting patients as the practical of patient safety | 10 |
| Attaching patient safety to every clinical course taken | 18 |
| Being the last major learning experience..... | 3 |
| Confusing patient safety practice and patient safety theory | 31 |
| Critiquing for patient safety | 14 |
| Delegating patients safety | 12 |
| Embedding patient safety within IPE courses | 24 |
| Extending through out..... | 15 |
| Failing to know how patient safety integrated into IPE..... | 28 |
| Focusing on the practical aspect of patient safety | 8 |
| Having and environmental focus | 7 |
| Having clinical environment as the predictor of patient safety | 11 |
| Including patient safety with care information | 16 |
| Seeming unclear as to student exposure to patient safety..... | 25 |
| Monitoring vs learning..... | 4 |
| Providing patient safety component in every course | 19 |
| Requiring a nonspecific number of hours..... | 21 |
| Requiring non-specific units exposure of patient safety education | 22 |
| Showing unawareness of how patient safety impacts the IPE..... | 29 |
| Timing of patient safety courses were unclear | 27 |

Appendix V: Code Sheet Report Participants 3 and 4 Supplement A

Code Sheet Report

Level 1

Idea-Source

Requiring a nonspecific number of
r15p3r18p3r19p3r20p3r21p3r22p4

Attaching patient safety including patient
r12p3r12p3r14p3r15p3r16p4r18p3

Erratic unit value for patient

Embedding patient safety within IPE

Having erratic unit requirement patient

Clinical environment as the predictor
r3p3r4p3r7p3r8p3r10p3r11p3

Being the last major learning experience
r3p3

Requiring non-specific units exposure of
r22p4

Suggesting strength of patient safety
r2p1 r8p2 r14p1 r17p1 r17p1r20p2

Reducing risk Building values Dealing
r2p1 r8p2 r14p1 r17p1 r19p2 r26p2

Requiring a nonspecific number of
r15p3r18p3r19p3r20p3r21p3r22p4

Attaching patient safety including patient
r12p3r12p3r14p3r15p3r16p4r18p3

Erratic unit value for patient safety

Level 2

completing patient safety learning

confusing patient safety theory with

r25p3r28p3r19p3r21p3r24p3

integrating patient safety IPE complex

integrating patients safety IPE complex

lacking certainty of patient safety

Patient safety embedded in IPE coursework

Patient safety was embedded in IPE

completing patient safety learning unclear

confusing patient safety theory with

Level 3

Theoretical Concept

Showing unawareness of how patient safety impacts IPE attaching metrics to student exposure to patient safety in IPE

Appendix W: Interviews 5 and 6 Supplement B

Interview Questions:

1. What do you mean when you say patient safety is embedded in other IPE subjects?
2. What accrediting bodies ask for you to have in patient safety?
3. Is time constraints a major concern in teaching patient safety?
4. Freeth et al. (2005) proposed time constraints and resource shortages were core barriers to IPE curriculum development as IPE struggles for relevancy amongst traditional cross-discipline healthcare education fundamentals.
5. What do you think you could do better?
6. Are there additional steps you would like to take when it comes to patient safety?

Appendix X: Table of Contents Participants 5 and 6 Supplement B

Level 1 Codes

Table of Contents

Being constrained by time does not interfere in teaching patient safety 8

Challenging time constraints and resource shortages exists not barriers 11

Content in present state 15

Defining patient safety policies 6

Embedding not clear 2

Feeling satisfied 15

Having early exposure to patient safety 3

Having no barriers in teaching patient safety 11

Having patient as a theme 3

Having patient safety as a worthy program for resources 9

Having patients safety in the 2

Having plenty time to teach patient safety 9

Improving through evaluating 14

Most simple to complex processes 2

Patient safety policies 3

Reaching education goals in patient safety 18

Relying of on-line teaches and patient safety modules 17

Resource are based on worthiness of the program 12

Staying ahead of patient safety education 14

Teaching patient safety a mandate 5

Teaching patient safety is standardized 6

There sufficient time to teach patient safety 8

Timing constraints never happen 9

Appendix Y: Code Document Participants 5 and 6 Supplement B

CODE DOCUMENT

| | | |
|----|---|--|
| 1. | | Interviewer: What do you mean when you say patient safety is embedded in other IPE subjects? |
| 2. | <i>Embedding not clear</i> <i>Having patients safety in the most simple to complex processes</i> Focusing on processes | Participant 5: Other topics like hand washing hygiene and medical error disclosure are topics in the IPE course. |
| 3. | <i>Having patient safety as a theme</i> <i>Having early exposure to patient safety</i> Having first year exposure | Participant 6. The theme of the first year IPE continuum is Patient safety. |
| 4. | | Interviewer: What accrediting bodies ask for you to have in patient safety? |
| 5. | <i>Patient safety policies</i> <i>Teaching patient safety a mandate</i> Requirement for patient safety Responsible to teach | Participant 5: CODA and the Joint Commission |
| 6. | <i>Defining patient safety policies</i> <i>Teaching patient safety is standardized</i> Meeting patient safety standards | Participant 6: We are bound to meet the standards of the Commission on Dental Accreditation (CODA and in our hospital clinic to meet JHACO standards |
| 7. | | Interviewer: Is time constraints a major concern in teaching patient safety? |
| 8. | <i>There sufficient time to teach patient safety</i> <i>Being constrained by time does not interfere in teaching patient safety</i> Having no time | Participant 5: Not from my view. |

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY

| | constraints | |
|-----|--|---|
| 9. | <i>Having plenty time to teach patient safety</i> <i>Timing constraints never happen</i> Teaching patient safety is not time constrained | Participant 6: Never |
| 10. | | Interviewer: Do you agree with Freeth et al. (2005) proposed time constraints and resource shortages were core barriers to IPE curriculum development as IPE struggles for relevancy amongst traditional cross-discipline healthcare education fundamentals |
| 11. | <i>Having no barriers in teaching patient safety.</i> <i>Challenging time constraints and resource shortages exists not barriers</i> Overcoming patient safety teaching obstacles | Participant 5: Challenges, not barriers |
| 12. | <i>Having patient safety as a worthy program for resources</i> <i>Resource are based on worthiness of the program</i> Teaching patient safety generates resources | Participant 6: I do not agree with Freeth. If a program is worthy then the resources are forthcoming, if not then resources will dry up. |
| 13. | | Interviewer: What do you think you could do better? |
| 14. | <i>Staying ahead of patient safety education</i> <i>Improving through evaluating</i> Being proactive in teaching patient safety | Participant 5: We consistently review content and teaching approaches for improvements |
| 15. | <i>Feeling satisfied</i> | Participant 6: I am most satisfied with what we are |

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY

| | | |
|-----|---|---|
| | <i>Content in present state IPE</i> Produce knowledgeable patient safety students | proving and what students are learning about patient safety. |
| 16. | | Interviewer: Are there additional steps you would like to take when it comes to patient safety |
| 17. | <i>Relying on on-line teaches and patient safety modules</i> | Participant 5: Since we use the IHI modules, most likely to expand use of these on line tools. |
| 18. | <i>Reaching education goals in patient safety</i> <i>Feeling satisfied</i> | Participant 6: I believe we are providing the requisite information and training to assure excellence in patient safety |

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY

Appendix Z: Coding Levels and Idea Sources Participants 5 and 6 Supplement
CODING LEVELS AND IDEA SOURCES

| <u>Level 1</u> | <u>Level 2</u> Idea Source |
|---|---|
| Requiring non-specific units of exposure of | seeming uncertainty of patient safety r22p4 |
| Requiring a nonspecific number of | completing patient safety learning unclear r15p3r18p3r19p3r20p3r21p3r22p4 |
| Attaching patient safety including patient | confusing patient safety theory with r12p3r12p3r14p3r15p3r16p4r18p3 |
| Embedding patient safety within IPE | Erratic unit value for patient safety Having erratic unit requirement patient r25p3r28p3r19p3r21p3r24p3 |
| Having safety theme Patient safety clinical environment as the predictor | having patient safety standardized Integrating patient safety in IPE complex r3p3r4p3r7p3r8p3r10p3r11p3 |
| Being the last major learning experience | integrating patient safety in IPE complex r3p3 |
| Suggesting strength of patient safety | Patient safety embedded in IPE coursework r2p1 r8p2 r14p1 r17p1 r20p2 |
| Reducing risk Building values Dealing | Patient safety was embedded in IPE r2p1 r8p2 r14p1 r17p1 r19p2 r26p2 |
| Relying of on-line teaches Reaching | teaching patient safety |
| Attaching patient safety including patient | confusing patient safety theory with r12p3r12p3r14p3r15p3r16p4r18p3 |
| Embedding patient safety within IPE | Having erratic unit requirement patient r25p3r28p3r19p3r21p3r24p3 |
| Requiring non-specific units exposure of | Erratic unit value for patient safety seeming uncertainty of patient safety r22p4 |
| Requiring a nonspecific number of | completing patient safety learning unclear |

PRE-CERTIFICATION IPE CURRICULUM: IDEAL VS. REALITY

| | |
|---|---|
| | r15p3r18p3r19p3r20p3r21p3r22p4 |
| Providing patient safety component in | |
| Relying of on-line teaches Reaching | teaching patient safety |
| Having safety theme Patient safety | having patient safety standardized |
| Being the last major learning experience | integrating patient safety in IPE complex r3p3 |
| Suggesting strength of patient safety | Patient safety embedded in IPE coursework r2p1 r8p2 r14p1 r17p1 r17p1r20p2 |
| Reducing risk Building values Dealing r8p2 r14p1 r17p1 r19p2 r26p2 | Patient safety was embedded in IPE r2p1 |
| Clinical environment as the predictor | integrating patient safety in IPE complex r3p3r4p3r7p3r8p3r10p3r11p3 |

Level 3 Theoretical Concept

Defining patient safety showing results of patient safety
Showing awareness of how patient safety impacts IPE attaching metrics to student exposure

Appendix A1: Interview 5 Supplement B

1. What do you mean when you say patient safety is embedded in other IPE subjects?

Other topics like hand washing hygiene and medical error disclosure are topics in the IPE course.

2. What accrediting bodies ask for you to have in patient safety? CODA and the Joint Commission

3. Is time constraints a major concern in teaching patient safety? Not from my view.

4. Freeth et al. (2005) proposed time constraints and resource shortages were core barriers to IPE curriculum development as IPE struggles for relevancy amongst traditional cross-discipline healthcare education fundamentals. Challenges, not barriers.

5. What do you think you could do better? We consistently review content and teaching approaches for improvements.

6. Are there additional steps you would like to take when it comes to patient safety?

Since we use the IHI modules, most likely to expand use of these on line tools.

Appendix B1: Interview Participant 6 Supplement B

1. What do you mean when you say patient safety is embedded in other IPE subjects?

The theme of the first year IPE continuum is Patient safety.

2. What accrediting bodies ask for you to have in patient safety? We are bound to meet the standards of the Commission on Dental Accreditation (CODA and in our hospital clinic to meet JHACO standards.

3. Is time constraints a major concern in teaching patient safety? Never.

4. Freeth et al. (2005) proposed time constraints and resource shortages were core barriers to IPE curriculum development as IPE struggles for relevancy amongst traditional cross-discipline healthcare education fundamentals. I do not agree with Freeth. If a program is worthy then the resources are forthcoming, if not then resources will dry up. I am most satisfied with what we are proving and what students are learning about patient safety.

5. What do you think you could do better? In regard to what? IPE? Patient safety?????

6. Are there additional steps you would like to take when it comes to patient safety? I believe we are providing the requisite information and training to assure excellence in patient safety.

