A Scoping Review of Interdisciplinary Collaboration in Addictions Education and Training

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Abstract

Developing a workforce of multidisciplinary healthcare professionals equipped with the knowledge and skills to collaboratively address the public health crisis of alcohol and other drug (AOD) use is critical for effectively identifying, preventing, and managing AOD conditions and their sequelae. Despite general enthusiasm for interdisciplinary education and training, little is known overall about the nature and outcomes of interdisciplinary collaboration in addictions education and training. We conducted a five-stage scoping review of the literature to provide an eight domain overview of the state of interdisciplinary collaboration in addictions education (ICAE). In our final review of 30 articles, we identified a lack of conceptual and terminological clarity around ICAE but a wide range of learners and professional collaborators in ICAE initiatives, which focused on a variety of AOD topics and used a constellation of didactic, interactive, and service-learning teaching strategies and formats.

Although we found limited substantive educational or practice-oriented outcomes available for ICAE initiatives, learner and faculty feedback reflected high enthusiasm for ICAE and widespread perceptions of benefit for improved clinical care. Facilitators and barriers to the implementation of ICAE initiatives occurred at the level of the individual and the institution and ranged from pragmatic to conceptual. Emerging trends in ICAE initiatives included increased application of learning and implementation theory and extension of ICAE into research training. We conclude with recommendations to support ICAE as a new paradigm for addictions education for all health professionals.

Keywords: Alcohol-related disorders, collaboration, cooperative behavior, curriculum, drug use disorders, education, interdisciplinary, interdisciplinary communication, interprofessional relations, substance abuse, substance addiction

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Worldwide, unhealthy alcohol and other drug (AOD) use are significant health problems that impart medical, psychological, and environmental harm. Developing a workforce of multidisciplinary healthcare professionals equipped with the knowledge and skills to address AOD is critical. In the United States, AOD use education continues to be of limited depth and breadth in health professional curricula (Association for Medical Education and Research in Substance Abuse, 2002; Broyles et al., 2012; Mollica, Hyman, & Mann, 2011; Rasyidi, Wilkins, & Danovitch, 2012), with few continuing education, training, or retraining opportunities for practicing clinicians. Education and skills training to address AOD use in many clinical environments, by a variety of healthcare providers, is a first step in comprehensive workforce development to adequately prevent, identify, and treat AOD (Association for Medical Education and Research in Substance Abuse, 2002). Interdisciplinary partnerships in these training and workforce development efforts are highly appropriate given the myriad of factors that lead to AOD use and the myriad of approaches and strategies needed to comprehensively prevent, identify, and treat this use (Madden et al., 2006).

Project MAINSTREAM (Multi-Agency Initiative on Substance Abuse Training and Education for America) was a national multidisciplinary faculty development program designed to support workforce development and sustained curricular change in substance abuse education at academic institutions around the U.S. (Brown et al., 2006; Madden et al., 2006). To date, this addictions education initiative from 2001 to 2004 serves as the most comprehensive and well-known example of interdisciplinary collaboration in addictions education and training. In addition to workforce development and sustained curricular change, Project MAINSTREAM sought to establish and enhance educational competencies for providing basic substance abuse services across health-related disciplines, including (a) alcohol screening, brief intervention, and referral to treatment (SBIRT); (b) prevention services for children of parents with substance use disorders; and (c) implementation of evidence-based community prevention programs (Brown et al., 2006; Madden et al., 2006). Thirty-nine fellows (nurses/nurse practitioners [11], social workers [4], physicians/physician assistants [12], pharmacists [2], dentists [3], psychologists [2], occupational therapists [2], and public health professionals [3]) arranged into interdisciplinary teams of three sought to enhance the AOD curricula at their institutions. These teams engaged students and trainees to develop proficiency in educational competencies and were encouraged to conduct trainings for their faculty colleagues, thus expanding their influence "horizontally" among peers as well as "vertically" to their students' teams (Brown et al., 2006; Marcus et al., 2005). The second objective for each team was to complete a field-based implementation project (Madden et al., 2006; Straussner et al., 2005). Each of the five teams also received a mentor from the fields of medicine and public health; mentors supported curriculum development, content, and interdisciplinary collaboration (Brown et al., 2006).

Despite the comprehensive set of goals and activities in Project MAINSTREAM, the extent to which those activities generated and sustained long-term culture change regarding interdisciplinary AOD training is unknown. Furthermore, the extent to which other institutions developed similar interdisciplinary workforce development approaches is unknown. In fact, little is known overall about the nature and outcomes of interdisciplinary collaboration in addictions education and training.

We were interested in identifying and characterizing the whole spectrum of existing programs, curricula, and initiatives in addictions education that feature interdisciplinary collaboration and in understanding the current landscape of initiatives to facilitate and promote interdisciplinary addiction training. The purpose of this review was to provide an overview of the state of interdisciplinary collaboration in addictions education (ICAE). The eight primary objectives of the review were to (1) determine how ICAE is defined; (2) characterize the individuals involved in ICAE; (3) determine the content and format of ICAE initiatives; (4) describe the outcomes of various ICAE initiatives; (5) identify the benefits and drawbacks of ICAE; (6) identify the actual facilitators, barriers, and challenges associated with the development/implementation of ICAE initiatives; (7) describe the feedback of learners, faculty members, and other professionals involved in ICAE initiatives; and (8) identify emerging orientations, initiatives, and research questions in ICAE.

METHOD

We conducted a scoping review of the literature (Arskey & O'Malley, 2005; Levac, Colquhoun, & O'Brien, 2010). A scoping review is a type of literature review that allows broad mapping of the relevant literature in the field of interest, without restricting the review to certain populations, extremely narrow single research questions, articles with certain types of study designs, or articles of only a certain degree of methodological rigor, as one would do in a full systematic review (Arskey & O'Malley, 2005; Levac et al., 2010). Because our overall objective involved four main concepts (interdisciplinary, collaboration, addictions, and education), we anticipated a wide range of study designs and article types, including controlled trials, case reports, concept analyses, and commentaries. We used the five-stage methodological framework proposed by Arskey and O'Malley (2005) to guide our scoping review strategy, and our approach was enhanced by our adherence to recent recommendations for increasing the rigor of scoping reviews by Levac et al. (2010).

Stage 1: Identifying the Research Question

Scoping reviews typically involve initial research questions that are broad in nature, so as to capture the full breadth of the topic (Arskey & O'Malley, 2005; Levac et al., 2010). The lead and senior researchers/authors (L. M. B. and A. J. G.) developed eight specific research questions (primary aims, noted above) to guide the scope of inquiry, describe multiple dimensions of ICAE, and ensure the greatest breadth and depth of coverage possible (Levac et al., 2010). The eight aims mirror these research questions, which were developed by the primary and senior author based on prior general knowledge of the addictions education literature, ongoing training programs and activities, and proposed strategic initiatives of interdisciplinary and addiction professional organizations.

Stage 2: Identifying Relevant Studies

Because our intent was to be as broad as possible, our initial search strategy was based upon the following definition of interprofessional and interdisciplinary education: "occasions when two or more professions learn from and about each other to improve collaboration and quality of care" (Centre for the Advancement of Interprofessional Education, 1997). This definition is highly congruent with other organizations' definitions for "multiprofessional education" (World Health Organization, 1998). The lead and senior author soon broadened our working definition to focus more on the broader concept of "interdisciplinary collaboration" for several reasons. First, the interprofessional/interdisciplinary education definition potentially restricted us to collaborative educational

endeavors occurring only between learners from different professional disciplines. Second, many articles involved activity/collaboration by multiple professional disciplines but were not formally self-identifying their initiatives as "interprofessional education." Because of this, we began to consider the interrelationships between interdisciplinary collaboration and interprofessional education, and it became apparent that interdisciplinary collaboration in (addictions) education often manifests itself through interprofessional education initiatives. By its very nature, interprofessional education includes interdisciplinary collaboration because the learners often collaborate during the learning experiences and are exposed to content and activities that are meant to promote further interdisciplinary collaboration in practice. However, ICAE also involves collaboration by interdisciplinary faculty and individuals from academic institutions and community agencies who work together to develop a course, program, and/or activities for a diverse set of learners.

To capture evidence of interdisciplinary collaboration occurring outside the context of the learners, we refined our search strategy to focus on ICAE and used this definition of interdisciplinary: "various health professionals working together" (Madden et al., 2006). Although broad, this definition simultaneously implies collaboration through its inclusion of the words "working together." Similarly, other authors have explicitly used the terms "interprofessional" and "interdisciplinary" interchangeably and defined both as "two or more disciplines working together to achieve common goals" (Mihalynuk, Soule, Kang, Kedzierski, & Johnson, 2007). This revision of search strategy is consistent with recommendations by Levac et al. (2010) to allow the scoping review search to inform itself through an iterative process of refining the search strategy.

To identify relevant studies, the lead authors/researcher (L. M. B.) and two research assistants (RAs; J. W. C. and J. D. H.) then searched five electronic databases (PubMed, Medline, CINAHL, PsychInfo, and Google Scholar) using permutations of the following terms from four clusters: (a) interdisciplinary, multidisciplinary, and interprofessional; (b) collaboration; (c) education, training, continuing education, and practice; and (d) addiction, substance use/abuse/dependence, alcohol, and drugs. Searches involving clusters a, b, and c along with individual substances or categories of substances (e.g., opiates, cocaine) rarely yielded results. Our search was limited to English-language articles from 1990 to present. Consistent with the scoping review approach, searches were not limited by original study design or methodology (Arskey & O'Malley, 2005; Levac et al., 2010). The search strategy was supplemented by searching the reference lists of obtained articles and further informed by our knowledge of colleagues engaged in ICAE activities with in-press publications (Arskey & O'Malley, 2005).

Stage 3: Study Selection

The lead author/researcher and RAs independently reviewed article abstracts for possible inclusion according to the guiding research question and met several times to discuss their potential relevance. The study selection process evolved as the three reviewers became more familiar with the available literature. Final decisions regarding abstract selection were made by the lead author. We identified 90 articles via abstract review that we subsequently obtained.

Stage 4: Charting the Data

As suggested by Levac et al. (2010), the scoping review process is not quite as linear as depicted in the original methodological article by Arskey and O'Malley (2005). We found that there was considerable interplay between framework stages 3 and 4. In stage 4, the RAs independently reviewed each article using a template for data extraction that was based on the eight original study aims and added additional contextual notes and commentary. The RAs then generated questions for group discussion regarding the focus of each article and gave first-pass ranking regarding its relevance. The RAs and the lead author held several meetings to discuss data extraction, article relevance, and refinement of the search strategy. A preliminary categorization of the articles was developed at this time. First, conceptually or philosophically oriented articles on interdisciplinary collaboration, interprofessional education, or interdisciplinary clinical practice were set aside for historical/contextual information or conceptual perspective. These informed refinement of the search strategy over time. Second, remaining articles were rejected for inclusion if the team was unable to identify clear evidence regarding (a) involvement of more than one professional discipline or (b) educational content on knowledge, skills, attitudes, or practice related to substance use/abuse/dependence. Articles remained open for recategorization throughout this process as the content of the field became more distinct. Approximately 20% of the articles were dually reviewed by the RAs. The lead author reviewed all 63 articles, and each article template was completed by the two RAs, adding comments or perspective to the summaries.

Stage 5: Collating, Summarizing, and Reporting the Results

As we became increasingly familiar with the body of literature, the selected literature was thematically organized into an initial categorization scheme primarily based on the learners in the educational initiative (i.e., undergraduate students, health professional students/trainees, and healthcare professionals). All articles received a final categorization by the lead author. Twenty-seven articles were ultimately rejected. Of the remaining articles, 30 were used for the final review. In addition, 35 articles were used for conceptual, historical, or philosophical context on interdisciplinary collaboration and interprofessional education, and two of these articles were also included in the final review.

In summation, this scoping review and manuscript preparation process was conducted over a 4-month period. Overseen and assisted by the lead author, the two RAs performed the iterative process of searching for, retrieving, and selecting

articles then refining the search and repeating the process over approximately 2 months. The process of data extraction, also completed primarily by the RAs, overlapped with this process and took approximately 2 months (approximately 75–80 hours per RA). During this time, the lead author reviewed all articles and templates and met with the RAs four to five times to discuss, categorize, and synthesize the findings. During the fourth month, the lead author, one RA (J. W. C.), and senior author assumed primary responsibility for manuscript preparation and met four times to assign sections and discuss progress. The project was not supported by an individual funding source.

RESULTS
We discuss our results delineated by our primary objectives.

ICAE Definition and Terminology
In the 30 articles that we reviewed on addiction education initiatives involving more than one professional discipline, formal definitions of "interdisciplinary/interprofessional" or "collaboration" were rarely provided. When present, definitions tended to be very broad in nature. Overall, the prefixes of "multi-," "inter-," and "trans-" were typically combined with the suffixes of "-professional" and "-disciplinary," or "specialty" in a variety of permutations, which were then combined with one or more of the nouns "collaboration," "education," and "practice." Interchangeable use and conflation of terms was common in the articles we reviewed. For example, related concepts such as "interprofessional education" and "interdisciplinary collaboration" were often conflated, with limited conceptual clarity between the two (Oandasan & Reeves, 2005; Reeves et al., 2011). In addition, several addictions education initiatives were deemed "multispecialty," which referred to the involvement of more than one subspecialization within medicine (e.g., family medicine, obstetrics/gynecology, psychiatry; Rasyidi et al., 2012; Tetrault et al., 2012). Although these initiatives do not take the conventional definition of "interdisciplinary," we included these articles because of their clear intent to train a wide range of providers in addiction and because many physicians consider these initiatives "interdisciplinary" (Grant, Finocchio, & Pew Health Professions Commission, 1995).

Furthermore, programs or initiatives were often framed as involving more than one discipline and/or listed the disciplines of the learners or faculty, but the specific ways in which this interdisciplinarity was manifested in curriculum development, learner interaction, or program activities, management, and evaluation were unclear (Stanton, Atherton, Toriello, & Hodgson, 2012; Tanner, Wilhelm, Rossie, & Metcalf, 2012; Truncali et al., 2012). In a related vein, interdisciplinary collaboration across various disciplines was often implied but rarely explicated. Some authors, however, were explicit about the forms of interdisciplinary collaboration occurring between learners or among health professional faculty organizers. These included interdisciplinary team-based problem-solving exercises and joint projects for learners (Cobia, Center, Buckhalt, & Meadows, 1995; Herie, Connolly, Voci, Dragonetti, & Selby, 2012; Storti & Maranjian-Church, 1999; Straussner et al., 2005; Wendler & Murdock, 2006) and, for health professional faculty, roles as development committee or task force members, expert trainers/co-teachers/mentors, and evaluators (Baez, Eckert-Norton, & Morrison, 2004; Herie et al., 2012; Madden et al., 2006; Marcus, Rickman, & Sobhan, 1999; Near & Martin, 2007; Storti & Maranjian-Church, 1999; Truncali et al., 2012).

Characterization of the Individuals Involved in ICAE
We identified the following categories of individuals involved in the addiction education initiatives or programs involving interdisciplinary collaboration: (1) undergraduate college students, (2) prelicensure health professional students, (3) postlicensure health professionals, and (4) health professional faculty members in academia. Prelicensure health professional students included students in nursing, medical, dentistry and pharmacy, public health, social work, and other professional programs. Postlicensure health professionals included a wide range of individuals, including nurses/nurse practitioners, physicians/physician assistants, dentists, social workers, mental health workers/therapists, addiction counselors, medical assistants, and others who had obtained their professional degrees and/or licenses and were employed in healthcare or other community settings. Postlicensure health professionals engaged in advanced training such as clinical or research fellowships were also included in this category.

Individuals in the first three categories were primarily the learners in addiction education initiatives or programs involving interdisciplinary collaboration, whereas those in the fourth category, health professional faculty members, primarily served as the developers, educators, and organizers of the educational initiatives. However, there were exceptions. For example, in several instances, postlicensure health professionals employed in community agencies served as coordinators or mentors for educational activities jointly sponsored by community agencies and academia (Iles-Shih, Sve, Solotaroff, Bruno, & Gregg, 2011; Marcus, 2000; Mihalynuk et al., 2007). In another example, Project MAINSTREAM fellows simultaneously served as learners on interdisciplinary work teams in their career development activities and as faculty members teaching and implementing curricular change in substance abuse education at their own institutions (Brown et al., 2006).

Content and Format of ICAE Initiatives
The content of ICAE initiatives for all types of learners focused on a variety of addiction-related topics, including the biopsychosocial aspects of addiction (Near & Martin, 2007; Wendler & Murdock, 2006), SBIRT (Brown et al., 2006; Madden et al., 2006; Stanton et al., 2012; Tanner et al., 2012), interdisciplinary teamwork strategies for addictions service or education delivery (Cobia et al., 1995; Storti & Maranjian-Church,

1999; Straussner et al., 2005), substance use and psychiatric dual diagnosis (Bailey, 2002), addictions recovery, and tobacco cessation and policy (Herie et al., 2012). In addition, several initiatives combined addictions content with formal interdisciplinary research training for health professional students and postlicensure health professionals (Meyer, Babor, & Hesselbrock, 1988; Truncali et al., 2012).

Regardless of the target learners, ICAE initiatives also varied widely in their format and included traditional classroom experiences, web-based learning modules, community-based service learning experiences, expert- and peer-led workshops/discussion, and small group exercises. Teaching modalities included lecture, case exemplars/clinical vignettes/problem-based learning activities, objective structured clinical examinations/clinical role-playing with other learners or standardized patients, on-site coaching and feedback, and mentored research experiences. Most ICAE initiatives, particularly those for health professionals, explicitly invoked principles of adult learning and strove for a balance between didactic, experiential, and interactive learning experiences and included learner-driven curricula (Marcus et al., 1999; Stanton et al., 2012) and structured time for dialogue and reflection (Iles-Shih et al., 2011; Mihalynuk et al., 2007; Storti & Maranjian-Church, 1999; Wendler & Murdock, 2006).

Outcomes of Various ICAE Initiatives

Few articles contained substantial description of any knowledge-, attitude- and practice-related outcomes of the ICAE initiatives. Reported outcomes were typically preliminary, anecdotal, and limited to participants' general satisfaction with the initiative and/or self-reported confidence/self-efficacy in applying new knowledge and skills (Iles-Shih et al., 2011; Marcus et al., 1999; Mihalynuk et al., 2007; Near & Martin, 2007; Stanton et al., 2012; Storti & Maranjian-Church, 1999; Tanner et al., 2012; Truncali et al., 2012). In several instances, however, more rigorous outcomes were reported. Several authors reported changes in health professional and health professional students' substance abuse knowledge (Brown et al., 2006; Tanner et al., 2012; Wendler & Murdock, 2006). The published literature was scant regarding reports of significant changes in attitudes about addiction (Tanner et al., 2012; Wendler & Murdock, 2006). Regarding practice change, in one study, the impact of a shared learning program on health professional learners' self-reported clinical practice (joint assessment and interventions) for dual-diagnosis clients was variable (Bailey, 2002). In another ICAE initiative promoting tobacco cessation treatment, significant changes were identified in participants' perceptions of the importance, feasibility, and confidence for implementing the skills and knowledge that they gained in the training initiative (Herie et al., 2012).

In addition, Project MAINSTREAM fellows reported providing over 10,000 learners with approximately 67,000 hours of substance abuse education through the development of 123 curricula for a variety of professional audiences. Within the curricular activities, approximately a quarter were attended by learners from more than one professional discipline, and 9 out of the 13 teams of fellows collaborated to develop and teach interdisciplinary addictions courses at their institutions. Fellows were productive with respect to related peer-reviewed publications, conference presentations, and awards/appointments (Brown et al., 2006; Marcus et al., 2005).

Benefits and Drawbacks of ICAE

Overall, IC was widely perceived as a positive notion, that is, a precursor to and outcome of interprofessional education, which in turn supported improved patient care. That is, because of its inherently collaborative nature, interprofessional education purportedly provides learners from various disciplines with shared foundational knowledge and skills, mutual respect, and improved communication, all of which in turn improves interdisciplinary collaboration in clinical practice and produces better patient outcomes (Bailey, 2002; Barnsteiner, Disch, Hall, Mayer, & Moore, 2007; Clement, Williams, & Waters, 1993; Reeves, 2001; Storti & Maranjian-Church, 1999; Wendler & Murdock, 2006). Several authors explicitly stated these assumptions as the primary rationale for their ICAE efforts, whereas others justified their efforts based on the anticipated benefits of being able to more comprehensively address the complexity of substance abuse (Near & Martin, 2007) and/or patients' needs (Cobia et al., 1995). Perceived or anticipated drawbacks specific to ICAE were rare.

Realized Facilitators, Barriers, and Challenges Associated with the Development or Implementation of ICAE Initiatives

Various environmental or institutional factors were reported to facilitate or inhibit the development or implementation of ICAE initiatives. Major facilitators included the availability of practical educational materials, mentorship, and resources/funding for the initiative and support from colleagues, department, and institutional leaders (Baez et al., 2004; Iles-Shih et al., 2011; Marcus et al., 2005). Barriers and challenges included limited room for interprofessional education initiatives in already-full curricula; scheduling conflicts that compromised interdisciplinary productivity or student participation; retention/turnover among learners/faculty/community partners; limited funding or sharing funding across departments, lack of faculty recognition/reward for interdisciplinary teaching, and internal conflict across disciplines because of differing foci on goals and actions versus process and communication (Brown et al., 2006; Madden et al., 2006; Marcus et al., 2005; Mihalynuk et al., 2007; Storti & Maranjian-Church, 1999; Tetrault et al., 2012; Truncali et al., 2012). In addition, several authors raised that challenges related to the amount of discipline-specific content or approaches might be needed for interdisciplinary education in addictions, for example, creating a meaningful "generic" curriculum or managing content or teaching modalities that were incongruent with certain disciplines' paradigms or norms (Baez et al., 2004; Tetrault et al., 2012; Truncali et al., 2012).

Feedback from Learners, Faculty Members, and Other Professionals on ICAE

In general, undergraduate, health professional student, and postlicensure health professionals enjoy ICAE and find it worthwhile. Most articles contained positive anecdotal reports of general course or satisfaction evaluations; these learners enjoyed working under/with faculty and students from other disciplines and believed that the experience prepared them well for clinical practice and/or community partnerships (Baez et al., 2004; Iles-Shih et al., 2011; Mihalynuk et al., 2007; Near & Martin, 2007; Stanton et al., 2012; Tetrault et al., 2012; Truncali et al., 2012).

Wendler and Murdock (2006) reported that participants found training on co-occurring disorders relevant and informative, were equally satisfied with peer-led and expert-led modules, and found the interdisciplinary training process to be particularly salient and enjoyable. Project MAINSTREAM fellows reported the following benefits: curricular inclusion of content or expertise that would have otherwise been absent; collaboration and peer education with individuals outside one's typical domain; broader relevance, impact, and potential sustainability of the initiative; professional development for effectively working in teams/networking; and enhanced access to new sources of trainees. In addition, for 14 of the 18 benefits, fellows indicated that interdisciplinary approaches were "far more" or "somewhat more" advantageous than single discipline approaches (Madden et al., 2006). Overall, direct perceptions of health professional faculty were rare and, instead, manifest as the facilitators, barriers, and challenges to ICAE (objective 6) as these were primarily the individuals reporting on the initiatives.

Emerging Orientations and Initiatives in ICAE

Recent articles feature philosophical discourse on interdisciplinary education and research and the use of theory in ICAE initiatives. McMurtry (2011) encourages the integration of the two typically "siloed" perspectives on interdisciplinarity, that is, that which promotes interdisciplinarity on the basis of complex phenomena such as addiction (knowledge) and that which promotes interdiscplinarity based on the complexity of and sociocultural dynamics between the professional disciplines (knowers). Other authors report the application of learning and implementation theory to ICAE initiative development, implementation, and evaluation (Bailey, 2002; Herie et al., 2012; Tanner et al., 2012). Web-based learning modalities are also emerging in ICAE (Tanner et al., 2012; Truncali et al., 2012), as are peer-learning communities of practice that extend beyond the initial educational activity (Herie et al., 2012). Emerging ICAE initiatives that support research education and training (Meyer et al., 1988; Truncali et al., 2012) promote interdisciplinary collaboration in addictions research, which complements ICAE and clinical care. Finally, there is increasing attention to the need for more studies of ICAE initiatives that feature comparative designs and the rigorous evaluation of more substantive outcomes, including the impact of ICAE initiatives on clinical practice, service delivery, and organizational capacity and cost-benefit analysis of ICAE initiatives (Herie et al., 2012; Mihalynuk et al., 2007; Wendler & Murdock, 2006).

DISCUSSION

We conducted the first five-stage scoping review of ICAE. Each of our eight objectives had literature to support a consensus that will assist in modeling, developing, and implementing ICAE. Several broad conclusions can be reached from the available literature of our scoping review based on these eight domains.

We found that conceptual and terminological overlap and conflation was common around the terms interdisciplinary, interprofessional, and multidisciplinary, and formal definitions of interdisciplinary/interprofessional or collaboration were rarely provided or broad in nature; other authors have reported similar findings (Choi & Pak, 2006; Reeves et al., 2011). This lack of conceptual and terminological clarity may inadvertently hamper efforts to expand ICAE initiatives; for example, key stakeholders may have widely different perceptions regarding the potential degree of interaction and partnership across disciplines involved, creating challenges for interdisciplinary communication and enthusiasm around the initiative.

We also found that a myriad of individuals are involved in ICAE—as learners, teachers, mentors, and community partners. Interdisciplinary collaboration among and between health professional faculty and community professionals from various professional disciplines provides the context and structure for interdisciplinary collaboration between interdisciplinary learners such as undergraduate and health professional students and health professionals receiving continuing education or professional development. Although the interdisciplinary collaboration between learners is often more visible, the behind-the-scenes interdisciplinary collaboration between faculty and community professionals is what drives experiences for learners and speaks to the need for faculty/institutional support and incentives for expanding ICAE initiatives.

In addition, we found that the content and format of ICAE initiatives varied widely, and many incorporated principles of adult learning and a balance between didactic, experiential, and interactive learning experiences. The wide range of content raises the question of the potential need to set priority topic areas for ICAE initiatives that are highly responsive to real-world clinical practice and health policy priorities (e.g., inpatient SBIRT; The Joint Commission, 2012).

Unfortunately, to date, we found limited substantive educational or practice-oriented outcomes available for ICAE initiatives. Although ICAE initiatives hold promise for the perceived benefit of improved patient care, this widely held assumption is largely unsupported by evidence. An important issue is the outcome that is intended for the learners. If the intent is to train health professional students in a milieu of interdisciplinary activity, programs such as Project MAINSTREAM have shown that training can occur. Do fellows

subsequently train subsequent students in an interdisciplinary way? Do trainees become trainers? We believe that outcomes regarding interdisciplinary training and collaboration must reflect outcomes specific to the interdisciplinary training approaches. Simply put, future ICAE should measure the trainees' knowledge, attitudes, and subsequent practice of interdisciplinary addiction activities.

We found that facilitators and barriers to the implementation of ICAE initiatives occur and range from the pragmatic (e.g., funds, materials, scheduling) to the conceptual (e.g., uncertainty regarding the amount of discipline-specific content needed) to the in-between (e.g., administrative support; Choi & Pak, 2007; Pecukonis, Doyle, & Bliss, 2008). In the absence of outcomes from rigorously designed studies with comparison groups, key educational, administrative, and clinical stakeholders may be reluctant to invest the immense amounts of time, coordination, resources, and stamina needed to promote these facilitators and overcome these barriers to develop and implement ICAE initiatives. Fortunately, we found that learners, faculty, and community partners appear to have highly favorable responses to ICAE initiatives where they have the opportunity to learn from and collaborate with one another. Whether this collaboration promotes improved provider-, learner-, patient-, or system-level outcomes remains unclear.

Finally, we found that trends in ICAE appear to be increased application of learning and implementation theory. The use of theory to guide ICAE initiative development, execution, and evaluation will further support the rigor needed to comprehensively identify the outcomes of ICAE initiatives. In addition, emerging ICAE initiatives that support addiction research education and training are highly consistent with recent initiatives in "team science" (Stokols, Hall, Taylor, & Moser, 2008) and reinforce the need to develop interdisciplinary, collaborative addiction researchers as well as collaborative addiction care providers. Increased ICAE, care, and research will help support the broad base of workforce development needed to fully realize the promise of improved AOD identification, assessment, treatment, and referral to treatment among varied patient populations in diverse clinical settings.

Through this five-stage scoping review involving eight domains of ICAE, we conclude that, to enhance the advocacy and implementation of ICAE, the addictions field should embrace interdisciplinary collaboration and its broad role in pregraduate and postgraduate health professional training, continuing education modalities and, ultimately, patient care. To establish a foundation for future ICAE initiatives, three important activities must occur. First, a common definition of training and education must be established. We advocate the term ICAE as a useful term that encompasses all the activities of interdisciplinary, interprofessional training in a collaborative, integrated environment. Second, although it is clear that several institutions and entities have established ICAE initiatives, the products—or outcomes—of those initiatives are less well established. Firm outcome measures should be defined and standardized for trainers, trainees, patients,

providers, and systems of care. Based on our review, we believe that knowledge, attitudes, and outcomes of interdisciplinary collaboration of addictions education should be evaluated. To propel key stakeholders to fund ICAE initiatives, ICAE initiatives should not only show improved effectiveness and efficiency of AOD use care but also show that interdisciplinary collaboration is the most effective means to accomplish improved outcomes. Finally, we believe that, for ICAE to be further developed, professional training schools and programs must reduce perceived and real institutional barriers to true collaboration. This may require a restructuring of pregraduate and postgraduate training programs to place a greater emphasis of delivery of healthcare through healthcare systems and interdisciplinary teams. For instance, the rapid development of team-based approaches to clinical care through such modalities as the "medical home" and interdisciplinary inpatient "walk rounds" should be taught, not just experienced in clinical practice. Through interdisciplinary training early in health professional trainees' education, greater efficiency of collaboration and integration of professional disciplines may occur in real-world practice settings. The addiction field is ripe to lead the field in interdisciplinary collaboration education, training, and clinical care. Through these initial steps, ICAE can flourish and become the new paradigm for addictions education for all health professionals.

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