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Interprofessional Education: Current State in Psychology Training

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Abstract

Healthcare reform has led to the consideration of interprofessional team-based, collaborative care as a way to provide comprehensive, high-quality care to patients and families. Interprofessional education is the mechanism by which the next generation health professional workforce is preparing for the future of health care—team-based, collaborative care. This literature review explored the extent and content of published studies documenting Interprofessional Education (IPE) activities with psychology trainees across learner level. A systematic review following PRISMA guidelines was conducted of studies describing IPE involving psychology learners. Electronic databases (MEDLINE, CINAHL, PsychINFO, and EMBASE) were searched for the following terms: inter/multi-professional education/practice, inter/multidisciplinary education/practice, and psychology/psychologists. Thirty-seven articles were identified that included psychology in clinical outcome studies or other reviews of interprofessional education initiatives. The review addresses the nature of current IPE learning activities, the impact of IPE activities on participating trainees, opportunities for, and challenges of, involving psychology trainees in IPE, and future directions for research. This review illuminates the relative paucity of the literature about IPE in psychology training. Given the trend toward increasing team-based collaborative care, the limited inclusion of psychology in the IPE literature is concerning. The next generation of health professional trainees is learning about, from, and with each other with the objective of building collaboration and teamwork. Given the few articles documenting psychology trainees' involvement in IPE, future health professionals quite possibly will have limited understanding of, and contact with, psychologists. Our findings are a call to action for greater psychology involvement in IPE.

Keywords Interprofessional education · Interprofessional collaborative practice · Transformative learning · Immersive learning · Professional identity formation · Healthcare professionals

Education in the health professions has historically been designed to promote the acquisition of knowledge and skills perceived to be integral to practice in each specific profession. Trainees traditionally were instructed by experienced practitioners within their discipline with most learning occurring in *intra*professional silos. Increasingly educators have been incorporating *inter*professional collaboration skills into intentional training experiences. Educational institutions are now creating meaningful, comprehensive, skill-building interprofessional education (IPE) activities for all healthcare trainees (IHI, 2010) to comply with expanding accreditation requirements that stipulate IPE exposure. Didactic and experiential training experiences that incorporate active-learning strategies as part of structured IPE curricula are recommended (Greiner & Knebel, 2003).

IPE and interprofessional collaborative practice (IPCP) are intertwined movements that are reshaping educational approaches and targeted outcomes in health professional training. The degree to which psychology educators and the profession have embraced these movements remains unclear. This manuscript identifies the foci and scope of IPE literature involving psychology trainees.

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Background

Interprofessional Education (IPE) dates back decades to international efforts (this history is summarized in World Health Organization [WHO], 2010) identifying IPE as a mechanism to improve job satisfaction, increase appreciation of healthcare teams, and provide a more holistic approach to patient care. More recently, the Institute for Healthcare Improvement (IHI, 2010) urged academic health institutions to implement IPE training to prepare health professional trainees to work effectively together in collaborative practice. IPE is a transformative educational approach that creates a series of learning experiences in which students from diverse health professions are brought together to learn about, from, and with each other with the goal of building collaboration skills (IPEC, 2011; Thistelwaite & Moran, 2010; WHO, 2010). Research has demonstrated that IPE activities enhance the quality of clinical collaborations and team-based care involving the current workforce, while readying the next generation (Reeves et al., 2010; Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013; Thistlethwaite & Moran, 2010).

Psychology arrived later than other professions to the IPE movement, joining an expanded Interprofessional Education Collaborative (IPEC) in 2016 (IPEC, 2016). Zorek and Raehl's (2013) review of accreditation standards documents across various health professions revealed 18 of 21 included IPE-related statements holding programs accountable for meeting an IPEC competency outcome. The highest number of these "accountable" statements were encoded in nursing and pharmacy educational accreditation standards; no explicit IPEC competency statements were integrated in psychology accreditation standards under the American Psychological Association's (APA, 1996) *Guidelines and Principles of Accreditation* (Zorek & Raehl, 2013) which pre-dated IPEC.

The newer APA Commission on Accreditation's (APA, CoA, 2015) *Standards of Accreditation* (SoA) is relatively more closely aligned with IPEC (2011, 2016) competencies. The SoA require knowledge and skill development in consultation and in working in interdisciplinary systems, though IPE activities per se are not explicitly required. The SoA articulate nine Profession-Wide Competencies (PWCs) which all health service psychology learners are required to develop by completion of doctoral programs and internships. These PWCs include expanded consultation and interprofessional/interdisciplinary skills competencies. The APA CoA (n.d.) *Implementing Regulations* further stipulate that these competencies are "reflected in the intentional collaboration of professionals in health service psychology with other individuals or groups to address a problem, seek or share knowledge, or promote effectiveness in professional activities…" Trainees are expected to "demonstrate knowledge and respect for the roles and perspectives of other professions…demonstrate knowledge of consultation models and practice," and interns are expected to "apply this knowledge in direct or simulated consultation with individuals and their families, other health care professionals, interprofessional groups, or systems related to health and behavior" (APA, CoA, 2015). The SoA criteria for postdoctoral residencies allow programs to determine which advanced competencies are relevant to the program's specialty or focus areas, so the SoA are silent, rather than explicit, about requirements for the consultation and interprofessional/interdisciplinary skills competence for postdoctoral level of training and do not explicitly use the terminology "interprofessional education."

Given the trend for broader incorporation of IPE across health profession education accreditation standards, including the recent addition of IPE-related PWCs for psychology trainees, this study sought to examine the extent and content of published studies of IPE across the developmental continuum for HSP trainees.

Methods

This systematic review follows PRISMA guidelines (Moher, Liberati, Tetzlaff, Altman, & the PRISMA Group, 2009) with regards to identification, screening, eligibility, and included studies. It reviews studies describing IPE efforts in psychology, comprising both psychology learners as well as psychologists as program facilitators or involved in the design or implementation of IPE activities. Electronic databases (i.e., MEDLINE, CINAHL, PsychINFO, and EMBASE) were searched using terms and combinations of terms: inter/multi-professional education/practice, inter/multidisciplinary education/practice, and psychology/psychologists.

Inclusion criteria included any papers published in English through December, 2018 which pertained to the study and/or description of IPE in psychology. This included studies involving IPE activities involving psychology learners as well as the psychology profession in the teaching or program facilitation role. Papers that described or reviewed current IPE programing were included as well as descriptive or review papers of IPE attitudes, training models and standards, and the IPE movement in a broad sense were all included so long as the psychology profession was included. Exclusion criteria were any papers published after 2018, papers not printed in English, and papers that did not pertain to the profession of psychology. For example, papers that referred to psychological principles but did not include psychology learners or faculty were excluded.

Identification, Screening, and Eligibility

The initial yield of 126 titles reduced to 86 after duplicates were removed. Abstracts were screened for inclusion criteria, which further reduced the number of articles to 65. The full texts of the 65 articles were then reviewed to assess match of the selection criteria, leaving 37 papers for inclusion in the review. In each of these screenings, articles were removed when it became clear that they did not meet inclusion criteria or did meet exclusion criteria, particularly with respect to describing the role of psychology learners or faculty in IPE. For many articles, it was not initially clear if the discipline of psychology was included in the IPE program or study itself, or merely referred to as psychological concepts. Figure 1 provides an overview of the literature search process following the PRISMA flow diagram (Moher, Liberti, Tetzlaff, Altman, & the PRISMA Group, 2009).

Articles were then separated into those that focused on qualitative outcome evaluation of interprofessional curriculum that included psychology learners (Table 1) and all other articles that included psychology as either learners, faculty, or authors. For the outcome evaluation papers, information was pulled to summarize the specific types of learners for study, a description of the curriculum, and targeted outcome measures based on Kirkpatrick's (1994) four-level typology of educational outcomes:

- *Level 1—Reaction*: learner's general feedback on their perspective of the value and enjoyment of the learning experience.
- *Level 2—Learning*: includes *Attitude* change and *Knowledge/Skills* acquisition. This level focuses on specific changes as a result of educational curriculum to a learner's knowledge, skills, or attitude.
- *Level 3—Behavior*: measurements focus on behavior change outside of the specific learning environment.
- *Level 4—Results*: results of the behavioral changes to the organization (e.g., improved retention), employees (e.g., improved engagement), or patients (e.g., readmission rates, patient satisfaction, costs, etc.).

Other articles that broadly included psychology within the context of IPE were described in a separate table to include a brief description of the article, the role of psychology as described in the paper, and the primary audience of the journal that the paper was published (Table 2). These other articles were heterogeneous including: (a) literature reviews; (b) educational advocacy; (c) narrative descriptions of IPE curriculum

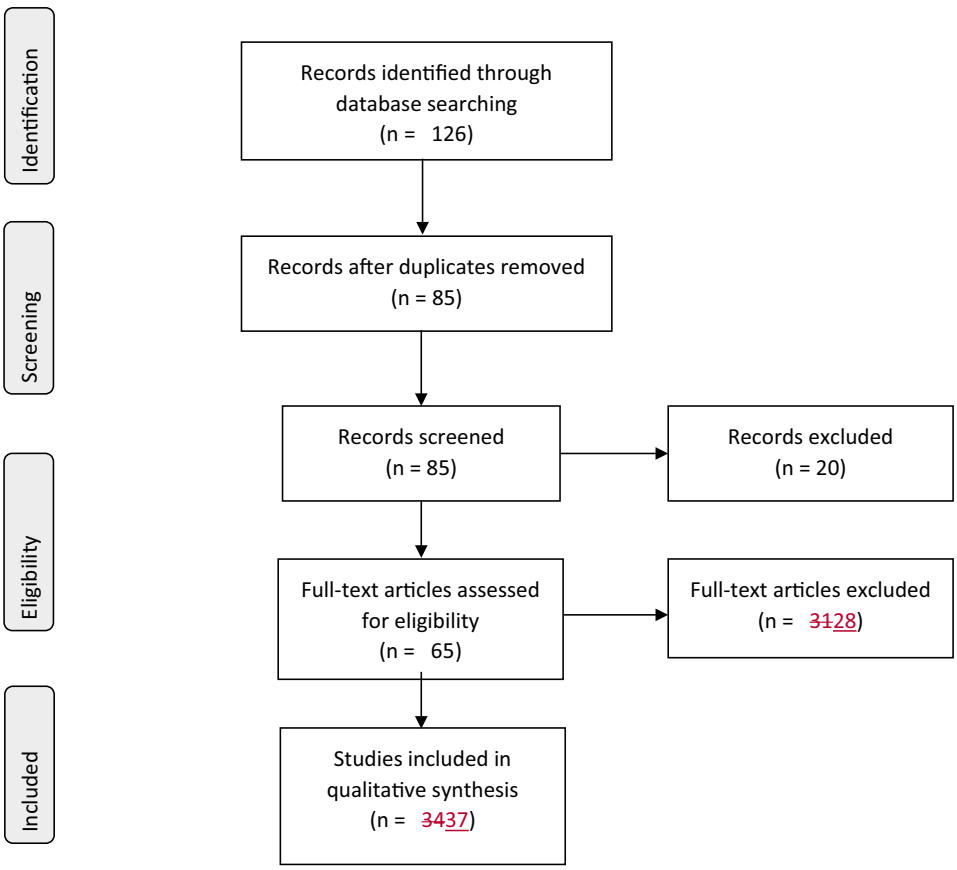

Fig. 1 PRISMA flow diagram of study selection

Table 1 Outcome evaluation publications that include psychology

Study	Target audience of learners	Description of intervention	Reported outcomes
Boland et al. (2016)	MD, PharmD, Psych., RN	Weeklong interprofessional immersion course	Learning (Attitudes, knowledge/ skills)
Charles et al. (2006)	Aud., Lab. Tech., MD, OT, PharmD, PT, Psych., RN, SLP, SW	Community immersion experience	Reaction
Dacey et al. (2010)	MD, PharmD, Psych., RN	Semester-long course utilizing lecture, role play, case studies, peer editing, presentations, and discussions	Learning (Attitudes, knowledge/ skills)
Garcia-Huidobro et al. (2013)	MD, Psych., RN	IPE course incorporating weekly home visits and behavioral health counseling sessions	Reaction
Hudson et al. (2017)	MD, OT, PT, Psych., RN	Collaborative competition (Health Care Team Challenge)	Learning (Attitudes, knowledge/ skill)
Kwon et al. (2018)	OT, PT, Psych., RN, Rehab	Collaborative peer review process for peer-reviewed journal	Reactions
Lee et al. (2012)	Epidemiology, MD, PT, Psych., RN, SLP, SW	Graduate course consisting of didactic and experiential learning activities focused on healthcare leadership skills	Learning (Attitudes)
Priest et al. (2008)	Psych., RN	Three facilitated and one self-directions session focused on case studies and group work	Learning (Attitudes, knowledge/ skills)
Sordahl et al. (2018)	MD, PharmD, Psych	Case Conference in context of VA system	Learning (Knowledge/ skills), Behavior
Straub et al. (2017)	ED, MD, Psych., SW	Graduate course in context of child protection and family services	Reactions
Wellmon et al. (2012)	ED, PT, Psych., SW	6 h IPE experience	Learning (Attitudes, knowledge/ skills)
Wellmon et al. (2017)	PT, Psych., RN, SW	6 h curriculum utilizing patients with chronic health conditions as healthcare mentors	Learning (Attitudes, knowledge/ skills)
Weppner et al. (2016)	MD, PharmD, Psych., RN	IPE care conference for high risk primary care patients	Reactions
Wharton et al. (2013)	PharmD, Psych., RN, SW	Graduate course on geropsychology taught interprofessionally	Reactions
Zook et al. (2018)	Psych., RN, SLP	IPE modules, case studies, virtual simulation, and shared case planning over 3 semesters	Learning (attitudes)
Zucchero (2017)	OT, Psych., RN, SW	5-h symposium on non-pharmacological approach to dementia including presentations, small group case discussions, team exercises, and large group processing exercise	Learning (attitudes, knowledge/ skills)

Aud. Audiology, *Ed.* Education, *Lab. Tech.* Laboratory technology, *MD* Medicine, *OT* Occupational Therapy, *PharmD* Pharmacy, *Psych.* Psychology, *PT* Physical Therapy, *Rehab.* Rehabilitation Sciences, *RN* Nursing, *SLP* Speech/Language Pathology, *SW* Social Work

Table 2 Characteristics of IPE articles that include psychology other than intervention outcome evaluations

Article	Article type	Psychology role in IPE	Target audience of journal
Bluestein and Cubic (2009)	Review of psychology in primary care and description of IPE model	Learners	Psychology
Chicorelli et al. (2016)	Consensus statement from student leaders	Learners	Interprofessional
Cubic et al. (2012)	Description of IPE in integrated primary care at internship level	Learners	Psychology
Davidson and Waddell (2005)	Description of IPE course focused on community-based family health	Learners	Academic Medicine
Da Motta and Pocheco (2014)	Description of IPE workshop development at residency level	Learners and faculty	Academic Medicine
De Oliveira et al. (2018)	Descriptive study of IPE attitudes	Learners/subjects	Nursing
Goldberg et al. (2014)	Outcomes evaluation of IPE program concluding need for psychology learners	Learners	Interprofessional
Gonzalez-Pascual et al. (2018)	Outcomes evaluation of IPE program on nursing students attitudes and skills	Learners	Interprofessional
Hertweck et al. (2012)	Descriptive study of IPE attitudes	Learners	Interprofessional
Hoover and Andazola (2012)	Description of IPE program	Leaners	Psychology
Jivanjee and Friesen (1997)	Descriptive study on interprofessional and family-professional collaboration in education program	Learners	Psychology
Kent et al. (2018)	Qualitative case study	Faculty	Interprofessional
Landoll, Maggio, Cervero, and Quinlan (2019)	Scoping review of IPE in Primary Care Behavioral Health and description of IPE program	Faculty	Psychology
Mahajan, Mohammed, Sharma, Gupta, and Singh (2018)	Review of IPE movement	Learners	Pediatricians
Marcussen et al. (2019)	Systematic review of IPE on mental health practices	Learners	Psychiatry
Margison and Shore (2009)	Review on IPE and IPP movement as relevant to school psychology training	Learners and faculty	Psychology
Roberts and Forman (2015)	Descriptive study of IPE attitudes in psychology undergraduate students	Learners	Interprofessional
Rozensky (2012)	Review of healthcare reform on psychology training	Learners and faculty	Psychology
Smith et al. (2015)	Descriptive/qualitative study of assumptions of roles and responsibilities in clinical care	Learners	Interprofessional
Ward et al. (2018)	Review of IPE movement	Learners and faculty	Psychology
Zorek and Raehl (2013)	Review of IPE accreditation standards in USA	Learners	Interprofessional

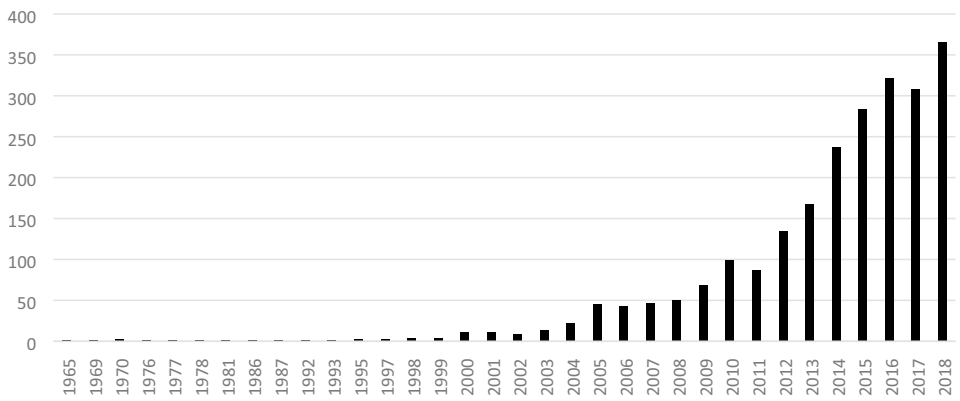

Fig. 2 Number of articles published per year with "interprofessional education" searchable in title or abstract in PubMED through 2018

and development; as well as (d) descriptive assessments of IPE attitudes and beliefs of psychology learners and faculty.

Current State of IPE in Psychology

Through December 2018, a search of PubMed with "interprofessional education" in the title/abstract identified 2348 articles, with a significant negative skew toward increasing publications with each passing year (Fig. 2). However, only 1.4% of these articles ($n = 37$) included the discipline of psychology as either learners or facilitators, reflecting the relatively minimal literature about psychology and IPE and seemingly limited impact of psychology education on IPE to date. Only two of these articles were published in predominantly psychology journals. Separate searches of "interprofessional education" combined with each profession that participated in IPEC (2011, 2016) revealed varying numbers of studies. The following two sections summarize this literature on IPE and psychology clustered in two main areas—IPE program evaluations and articles describing IPE with psychology learners or faculty.

IPE Program Evaluations

In published articles including psychology trainees, IPE programs have included them along with trainees in medicine, nursing, pharmacy, social work, speech-language pathology and occupational and physical therapies (Charles, Bainbridge, Copeman-Stewart, Art, & Kassam, 2006; da Motta & Pacheco, 2014; Gonzalez-Pascual et al., 2018; Sordahl et al., 2018; Zook, Hulton, Dudding, Stewart, & Graham, 2018; Wellmon, Gilen, Knauss, & Linn, 2012). The curriculum and teaching methods have been heterogeneous, including interprofessional case conferences (Garcia-Huidobro, Skewes, Barros, Pizarro, & Gawinski, 2013), collaborative competitive events (Hudson et al., 2017), virtual simulations (Zook et al., 2018), collaborative peer research reviews (Kwon et al., 2018), and IPE specific educational events (Charles et al., 2006; Priest et al., 2008; Boland, Scott, Kim, White, & Adams, 2016; Wellmon et al., 2012; Wellmon, Baumberger-Henry, Colby, Knauss, & Fletcher, 2017). The intensity of these educational experiences has ranged from one-day (5–6 h-long) events (e.g., Wellmon et al., 2017; Zucchero, 2017) to semester-long courses (e.g., Dacey, Murphy, Anderson, & McCloskey, 2010; Lee et al., 2012). Level of training also ranged, from undergraduate health-psychology learners (Dacey et al., 2010) to graduate and postdoctoral learners (e.g., Sordahl et al., 2018).

There is not currently a consensus on which tools should be utilized to evaluate IPE programs. A systematic review of collaboration and IPE instruments identified a variety of instruments measuring collaboration beliefs, attitudes, and behaviors (Walters, Stern, & Robertson-Malt, 2016). None of these instruments have been validated specifically with psychology learners.

Participant Reaction

Within Kirkpatrick's (1994) framework of training evaluation levels, IPE program evaluations have primarily been at level 1- participants' reaction or satisfaction with the educational program (e.g., Kwon et al., 2018; Straub, Kruger, & Bode, 2017; Weppner et al., 2016; Wharton et al., 2013). Across the body of research, outcomes have been overwhelmingly positive, with participants generally reporting high satisfaction (Garcia-Huidobro et al., 2013; Kwon et al., 2018; Wharton et al., 2013) and recommending the experience be offered to others or repeated (Straub et al., 2017).

Participant Learning: Attitude and Knowledge Skills

Individual competency expectations were highly variable across professions, further complicating evaluation. In a VA study initially designed as a comparative study of competency expectations, researchers found fundamental differences in how learners in selected professions (psychologists, physicians, nurse practitioners, pharmacists) described competence, especially as it related to their role in healthcare (Smith et al., 2015). In comparison with other health profession trainees, one study found psychology trainees reported lower scores on a measure assessing readiness to engage in IPE learning experiences despite having had more contact with other health professionals in training settings than most other trainee groups (de Oliveira et al., 2018). Thus, for psychology learners, contact alone with other professions may be insufficient for psychology learners to perceive themselves as collaborative practice ready or competent.

The learning objectives of IPE events have focused on attitudes, knowledge, and/or skills acquisition relative to the four IPEC core competency domains: (a) values/ethics; (b) roles/responsibilities; (c) interprofessional communication; and (d) teams and teamwork. Various studies concluded that IPE events result in increased knowledge of learners' own and other professions' roles within an interprofessional collaborative practice (IPCP) context (Hudson et al., 2017; Priest et al., 2008), improved respect for the contributions of other professions (Dacey et al., 2010), and improved attitudes toward IPCP and IPE (e.g., Dacey et al., 2010; Priest et al., 2008; Wellmon et al., 2012, 2017; Zook et al., 2018). Events that incorporate psychology trainees also led to increased confidence in working within an IPCP model (i.e., Boland et al., 2016).

Long-term outcomes have generally neither been reported by, nor analyzed based on, learners' professions, so it is unknown if psychology learners benefit from IPE to the same, lesser, or greater degrees as other learners. This may be a valuable question for future efforts given that differences among professions in degree of impact from IPE events have been identified (i.e., nursing, dentistry, and pharmacy students more than medicine and psychology; de Oliveira et al., 2018). Additionally, some programs were evaluated solely from the lens of other professions, so psychology trainees' outcomes were not studied at all (e.g., Gonzalez-Pascual et al., 2018). In an interprofessional sample of students that included psychology trainees, factors contributing to more positive attitudes toward IPE included prior exposure to healthcare, either as a patient or immediate family member, and female gender (Hertweck et al., 2012). For undergraduate psychology students, IPE attitudes were positively influenced by the strength of their professional identification, relative orientation toward clinical practice or science, and perceived relevance of IPE (Roberts & Forman, 2015).

Participant Behavior and Clinical Results

Only one study was identified that evaluated the impact of an IPE curriculum on participant behaviors, with the goal of increased collaborative practice. Sordahl et al. (2018) reported an increase in interprofessional consultations following a case-conference-style IPE event within the VA system. The current literature search revealed no IPE training experience involving psychology trainees that evaluated the impact of IPE on final results to the organization, employees, or patients (e.g., healthcare outcomes, patient satisfaction, costs, etc.).

Discussion

This review reveals that the body of research addressing IPE for psychology learners is smaller and narrower in scope than the IPE literature involving several other health professions' trainees. Psychology lags behind other health professions in absolute numbers of articles and in terms of the proportion of the IPE literature in this burgeoning area of educational research. By extension, one could hypothesize that psychology trainees are less involved in IPE activities than are learners of other professions (supported by a review of 42 countries and 396 institutions, where psychology trainees comprised only 5.9% of all learners in IPE events; WHO, 2010). The consequences of this minimal involvement are not known. However, concerns have been raised about the potential impact on perceived relevance of psychology as a health profession in the future of team-based care if psychology learners are not included in IPE activities, as this is one avenue where students of other professions learn about psychologists and the importance of psychology in healthcare (i.e., Ward, Zagoloff, Rieck, & Robiner, 2018). Notably, other disciplines have also noted the lack of psychology presence and have specifically identified psychology involvement as a strategy for improved IPE programming (Goldberg, Brown, Mosack, & Fletcher, 2014).

Minimal exposure to psychology students could include failure to develop cognitive schemata for "teams" that include psychologists (Chicorelli et al., 2016), creating risk that psychologists could be excluded from healthcare teams. Potential adverse consequences for psychology learners of their limited participation in IPE are inadequate preparedness for, and skills in, functioning in healthcare teams (Boland et al., 2016), through which increasing proportions of services seem likely to be delivered. Such effects may in turn have negative implications for the reputation and awareness of health service psychology as a health profession.

Cubic, Mance, Turgesen, and Lamanna (2012) issued a call to action for IPE to prepare psychologists for practice in primary care settings. They further underscored the importance of psychologists creating shared values and common goals with primary care providers. Along these lines, our findings may be construed as a call to action for greater involvement of psychology learners in IPE in all health service settings. As others point out, this call to action is not limited to primary care settings—IPE is an avenue for preparing psychologists for practice across all care settings which are increasingly becoming team-based, collaborative practice environments (Ward et al., 2018) as psychology further permeates primary care and diverse medical specialties, where interdisciplinary care models are expanding (e.g., oncology, neurology, pain, transplant).

National organizations, such as IPEC, and international organizations, such as the WHO, provide valuable frameworks for IPE. Training requirements developed by professions' accreditation bodies and professional associations provide further impetus to create and implement IPE and to promote collaborative competencies. It would be prudent for APA to provide more elaborated guidance in terms of IPE training guidelines and to enhance accreditation requirements. Specifically, aligning APA guidelines with IPEC competencies would further align psychology training with the training focused on by other professions. Clearer direction from the APA regarding the nature and extent of IPE experiences expected at the doctoral program, internship, and fellowship training levels would motivate and assist educators to develop and enhance IPE curricula and training opportunities.

Given the reality that many educational institutions sponsor training in multiple health professions, institution-level models for IPE program development are also needed. The

Centre for the Advancement of Interprofessional Education (CAIPE, 2013) provides general guidance on developing IPE programs for health profession trainees. Robust IPE programs involve multiple and diverse IPE events provided across the learning continuum within a developmental framework (i.e., novice to expert; Dreyfus & Dreyfus, 1986) and with a goal of cumulative impact (Ward et al., 2018). Sharing these IPE program models, materials for each IPE event within the program, assessment tools, and lessons learned in program development and implementation can facilitate their replication and lead to the development of best practices within and across institutions. Some statewide consortiums have begun this process (e.g., in Texas and Arkansas), but more interinstitutional collaboration is needed.

While a comprehensive review of potential barriers to, facilitators of, and opportunities for IPE implementation for psychology learners is beyond the scope of this paper, one qualitative study of multiple professionals involved in health science education, including psychology, revealed that the development of IPE programs is affected by multiple factors (Kent et al., 2018). Challenges included: maintaining ongoing and consistent engagement across professions, the large time commitment required for IPE activities, availability of facilities that can house IPE events with large numbers of students (i.e., when combining learners from multiple professional training programs), funding limitations for IPE events, faculty interest/availability and facilitator skills, and the need for leadership to champion IPE (Hall, 2005). A key implementation factor identified is the presence of psychology champions who advocate for the inclusion of psychology trainees, problem-solve barriers to psychology inclusion, and help design events so that they highlight the expertise of psychologists on care teams (Ward et al., 2018). Opportunities reported in the current review related to the enhanced relevance, inclusion, and respect for the expertise and contributions of the psychology profession within interprofessional teams far outweigh the more practical barriers outlined above.

Meeting professional development needs is paramount to prepare psychologists who have limited IPCP experience and who have not been trained in IPE methodology to successfully design and implement IPE events. Training psychologists in how to facilitate IPE events following best practices in event design and implementation, and effective ways to structure assessments and manage evaluation are needed. Pathways for preparing individuals for these diverse IPE roles include professional development offerings (e.g., IPE conferences, intra-institutional programming, continuing education) mentorship, leadership skill development, and creating peer-learning communities. Beyond psychologists' roles in education, psychologist clinicians working in team-based practices may benefit from professional development to refine and maintain collaboration skills (Babiker et al., 2014).

Limitations of this first systematic review of psychology and IPE are acknowledged. While discussed carefully by the research team, the search terms utilized may have limited the identification of relevant publications. Further, IPE is an emerging research area; there may be studies ongoing or not yet published that could meet inclusion criteria. There is also likely informal psychology involvement in IPE activities that has not been captured in the literature. Repeating this review in 5 years may better highlight the nature of psychologists' engagement in IPE and/or document trends in psychologists' increasing involvement in IPE.

While outcomes of collaborative practice are supported in the literature overall as superior to sequential or fragmentary care models, more research is warranted to ascertain psychologists' roles and contributions in developing and maintaining high-functioning teams. Rigorous approaches to investigating relevant variables, such as team members' collaborative skills, team processes, and educational and clinical outcomes are needed (Lemieux-Charles & McFuire, 2006). Large-scale, well-designed, randomized controlled trials are needed to better understand the factors in team-based care that promote positive outcomes and to compare IPCP processes, outcomes, and costs with those of less coordinated or sequential care (Wen & Schulman, 2014).

The IPE literature elucidating methods to prepare the health professional workforce for IPCP is growing. The modest extant data suggest more research will be indispensable to drawing clearer insights into IPE processes and outcomes and identifying and disseminating best practices (Lapkin, Levett-Jones, & Giligan, 2013; Olson & Bialocerkowski, 2014). Systematic reviews consistently reveal gaps in the literature including: (a) insufficient theoretical grounding of studies; (b) the need for standardized methods in implementing IPE across studies; (c) the necessity of developing meaningful, valid, reliable, and rigorous outcome measures for IPE and IPCP that can be used across trainings and professions; and (d) the importance of better understanding contextual factors that may impact outcomes (Lapkin et al., 2013; Olson & Bialocerkowski, 2014; Reeves et al., 2016).

A recent systematic review of IPE in mental health settings concluded that IPE positively affects attitudes among professionals and collaboration skill development (Marcussen, Norgaard, & Arnfred, 2019). The relative impact of different types of IPE events as well as the potential cumulative impact of more hours of IPE activity exposure over the learning continuum are not known. Large, well-designed, randomized control trials that track the immediate and long-term impact of IPE events on learners are needed. Understanding if these outcomes vary based on the learners' professions, and the particular impact on psychology learners is especially needed. By virtue of their scientist-practitioner

training and expertise in conducting and disseminating research, psychologists have valuable skill sets to contribute to, and provide leadership in, the design, implementation, and evaluation of IPE and IPCP studies (Ward, 2017).

It is most essential to conduct research evaluating IPE across the continuum of graduate, internship and fellowship levels because those learners are developing the skills pertinent to health service psychological services and teamwork. However, there is a benefit to develop a greater understanding of the potential roles and benefits of IPE at the undergraduate psychology level, as this is often where health professions' training begins. Further, among US physicians Psychology is a relatively common undergraduate major (fourth), accounting for an estimated 6.6% of US physicians according to the Bureau of Labor Statistics (Chen, 2017), so IPE involving undergraduate psychology learners may be a way of enhancing the understanding and connections between the disciplines.

Conclusion

As these data reveal, psychology as a profession has lagged behind other professions in embracing and championing the IPE movement and in integrating it into the training of future psychologists. Psychology trainees have been less involved in IPE relative to other health professions' trainees. The good news is that the opportunities for psychologists to become involved in IPE are growing. We hope that the profession will energetically answer this call to action for psychology learners, educators, and practitioners to become more intricately engaged with IPE. By doing so , they will be better positioned to create and seize opportunities to become more fully integrated into evolving team-based care delivery.

Compliance with Ethical Standards

Conflict of interest Katherine Lamparyk, Amy M. Williams, William N. Robiner, Heather M. Bruschwein and Wendy L. Ward have no conflicts of interest to report.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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