

# Exploring interprofessional education for collaborative practice in oral health education: a scoping review

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## ABSTRACT

**Background-**Interprofessional collaboration between professionals supports improved patient care and outcomes. Interprofessional education for collaborative practice (IPECP) in pre-licensure education promotes professional/interprofessional socialization. Within IPECP, students develop understanding of their professional role and begin developing an interprofessional identity- including collaborative skills, attitudes, and behaviours. IPECP literature in oral health education is limited. It is not well understood how oral health (OH) students are involved in IPECP and prepared for collaborative practice.

**Objective-**To assess the extent of the literature on IPECP within OH education and identify IPECP models and characteristics of experiences enabling professional/interprofessional socialization, interprofessional identity development and readiness for collaborative practice.

**Methods-**Guided by JBI methodology, CINAHL, DOSS, PubMed, APA PsycInfo were searched for peer-reviewed articles specific to IPECP models in pre-licensure education of OH students. Articles (n = 321) were screened by two reviewers for title/abstract, followed by full text. Twenty-eight articles were included.

**Results-**Single and multi-format IPECP models were identified including workshops, case-studies, simulation and clinical experiences. Characteristics of IPECP experiences were identified and categorized as: 1) Learning from, and about others, 2) Establishing social connections, 3) Authenticity of experiences, and 4) Consistent socialization and exposure. However, challenges for IPECP in OH education persist including siloed education and a lack of intentional IPECP curriculum.

**Conclusion-**Increased integration of OH students into health professions IPECP and consistent exposure throughout programs is needed. IPECP curriculum must enable students to equally explore their professional contributions to interprofessional teams. IPECP for developing an interprofessional identity in OH students remains understudied; longitudinal and qualitative analyzes are needed.

**Keywords:** collaborative practice, professional identity; interprofessional education; interprofessional identity; oral health education

**CDHA Research Agenda category:** capacity building of the profession

### Practice Implications

1. Consistent socialization between professions and exposure to collaborative experiences during pre-licensure education are needed to support oral health students' development of attitudes and behaviours for interprofessional practice.
2. Oral health students' preparedness for collaborative practice and development of an interprofessional identity is contingent on addressing barriers including limited exposure to authentic IPECP experiences, siloed curriculum and clinical training environments.

## BACKGROUND

Interprofessional collaborative practice (IPC) among the health professions has been widely recognized as a foundational component of comprehensive healthcare delivery and effective health systems.<sup>1,2</sup> Global attention to a need to train health professionals to work collaboratively and interprofessionally was prominently influenced by the World Health Organization (WHO)'s publication of *A Framework for Action on Interprofessional Education and Collaborative Practice*.<sup>2</sup> Included within this framework is a call for the integration of interprofessional education (IPE) into the pre-licensure curriculum of health professions. Interprofessional education is defined as “occasions where two or more professions learn with, from and about each other to improve collaboration and the quality of care”.<sup>3</sup> There is a growing base of evidence in support of interprofessional education for collaborative practice (IPECP) at the level of pre-licensure education to promote students' ability to work and communicate across disciplines, enhancing collaboration and quality of patient-centred healthcare practice.<sup>4-7</sup> IPECP experiences are varied across the spectrum of health education literature and include exposure and experiential learning opportunities alongside other students in classroom-based activities, simulation and clinical patient care. IPECP experiences during pre-licensure education are valuable to strengthening IPC in practice as students begin to develop increased understanding of their own role, that of other professions, and how to practice effectively within interprofessional teams.<sup>1,8,9</sup>

An understudied but growing area of research is the exploration of IPECP experiences for professional socialization and their contributions for developing a professional and interprofessional identity.<sup>1,7,10</sup> Professional socialization (PS) is a process of self-identity

construction, whereby exposure to specific social contexts and settings allows individuals to learn, and come to embody the responsibilities, attitudes and social behaviours of their chosen profession.<sup>11,12</sup> The foundations of professional identity formation are laid within students' professional education programs, and are subject to continuous development and evolution over the course of students' formal years of pre-licensure education and upon entry to practice.<sup>5-7,13</sup> IPECP experiences are identified as a catalyst to developing both a professional identity and for promoting socialization and understanding amongst the professions.<sup>1,5</sup> Further, IPECP experiences are identified to promote interprofessional socialization (IPS) where values and behaviours conducive to effective teamwork are developed and mutual understanding and trust between professionals is fostered.<sup>5,9</sup> Through collaborative experiences and exposure to other professions, individuals come to develop a 'dual'-professional and interprofessional- identity, which is crucial for enhancing collaboration and effective interprofessional healthcare teams in practice.<sup>9,10</sup>

There is a growing body of research on IPECP in health professions education for developing a dual professional and interprofessional identity. However, a scan of the evidence reveals that studies have largely focused on sampling primary care professions- including, nursing, medicine, physiotherapy as well as dietetics and social work.<sup>14,15</sup> Other health disciplines, including dentistry and dental hygiene have been largely excluded.<sup>16-18</sup> Dentists and dental hygienists represent highly trained and knowledgeable healthcare professionals, who are experts in the oral-systemic health link and leaders in the management, treatment and prevention of oral disease. Moreover, they represent health professions whose roles and scopes are complementary and contributory to one another and whom are professionally positioned to be effective collaborators within intimate teams.<sup>16,19</sup> Despite collaborative expectations, the

professions have been traditionally educated in siloes and have historically followed profession-specific (uni-professional) curricula and clinical training models during pre-licensure education.<sup>16</sup> Enacting comprehensive healthcare and effective care delivery requires interprofessional approaches, where oral health professionals are working together and alongside others in collaborative interprofessional teams.<sup>20-22</sup> As the burden of oral disease rises globally, shifting legislation in health and oral health policy is likely to garner an accelerated need for oral health professionals' integration into realms of primary care and interprofessional teams in the near future.<sup>23</sup> There is a gap in knowledge however, and need to understand how future oral health professionals (dentists and dental hygienists) are educated in, and socialized to interprofessional practice and prepared with the knowledge and skills for collaborative practice upon entry into the workforce.<sup>17</sup>

The rationale for this scoping review is to better understand how IPECP is currently occurring in oral health professions pre-licensure education. While general curriculum design in oral health education may reflect varying levels of IPE theory, this study is specific to analyzing IPECP experiences involving oral health students. Models of IPECP are diversely cited in the literature (classroom-based events/workshops, simulation, and clinical practice), and found to vary in timing and duration during students' programs. Understanding what models and characteristics (distinguishing qualities and impactful components) of students' IPECP experiences are contributory to professional and interprofessional socialization is needed. A preliminary search of CINAHL (EBSCOhost) and DOSS (Dentistry and Oral Sciences Source) (EBSCOhost) was conducted and no current or underway systematic reviews or scoping reviews were identified on this topic. A scoping review was identified as the most appropriate approach to assess the extent of the literature relevant to current IPECP experiences for oral health

students. This knowledge is crucial to identify gaps in current pedagogy and programming for IPECP in oral and health education and to direct future research and curricular reform that can support and strengthen IPC and healthcare teams in practice. This review was guided by the research questions:

- i) What models and characteristics of IPECP are identified to enable professional and interprofessional socialization and interprofessional identity development amongst oral health students?
- ii) What IPECP experiences are identified to enable development of collaborative skills, attitudes, behaviours and readiness for collaborative practice amongst oral health students?

#### **Inclusion criteria**

##### ***Population of interest***

The target population of this review are dentistry and/or dental hygiene students within IPECP during their pre-licensure education. Despite their status as distinct, regulated professions, the umbrella term of ‘oral health professions’ is often used to refer to the professions of dentistry and dental hygiene and may also extend to include other oral health care providers, such as dental assistants, therapists, and other professional titles depending on geographical location and national systems for oral health care.<sup>16,23</sup> In this review, ‘oral health students’ will be defined as dentistry and dental hygiene students and sources of evidence included will be specific to these professions. These professions were selected as they are identified globally to be amongst the largest of the oral health professions with complementary professional practice scopes and collaborative practice expectations.<sup>23</sup>

### ***Concept***

This review will identify IPECP experiences currently used in the context of pre-licensure education for oral health students. IPECP programming is inclusive of exposure events and experiential learning experiences where students from two or more professions learn with from, and about each other to develop mutual understanding and the skills, attitudes and behaviours that support effective interprofessional healthcare practice.<sup>4</sup> In addition, this review will explore the evidence of IPECP experiences for PS and IPS and characteristics of these experiences enabling students' development of an interprofessional identity and perceived readiness for IPC in future practice.

### ***Context***

This review will be confined to exploring the evidence of IPECP experiences during pre-licensure education for dentistry and/or dental hygiene students. This review is specific to identifying the contributions of IPECP experiences to students' professional and interprofessional socialization and identity development, rather than the role of IPECP in achieving explicit learning outcomes. Within the oral health profession literature, the terms 'intraprofessional' and 'interprofessional' are used interchangeably to describe IPECP experiences that include dentistry and dental hygiene students together. 'Intraprofessional' is a term that has been adopted in the oral health literature to describe interactions between the professions of dentistry and dental hygiene. Despite their distinct status as self-regulated health professions who may practice independently, or collaboratively together (interprofessionally) akin to non-oral health professions, traditional models and preconceived interpretations of oral healthcare practice have culminated in amalgamated perceptions and terminology to reference the professions. Therefore, both terms were included in this review and search strategy.<sup>16,24</sup>

## *Types of sources*

This scoping review considered quantitative studies on IPECP that used both experimental and quasi-experimental designs such as before and after (pre-test/post-test) studies and interrupted time-series studies. Qualitative studies on IPECP were also considered and no restrictions were placed on qualitative methodology used. Mixed-methods studies designed to generate quantitative and qualitative data from a combined approach of research methods and methodologies were also considered.

## **METHODS**

This scoping review followed an *a priori* protocol guided by JBI (formerly, *The Joanna Briggs Institute*) methodology for scoping reviews.<sup>25</sup> This contemporary methodology builds upon the seminal scoping review frameworks of Arksey & O'Malley<sup>26</sup> and Levac et al.<sup>27</sup> and aligns itself with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)<sup>28</sup>. As such, it provides a comprehensive, and systematic approach to conducting a review of the available literature on IPECP in oral health education. The scoping review protocol is registered in Open Science Framework.<sup>29</sup>

### **Search strategy**

This review aimed to locate published, peer-reviewed studies on the topic of IPECP in oral health education and professional and interprofessional socialization and identity development for OH students. An initial limited search of CINAHL (EBSCOhost) and DOSS (Dentistry and Oral Sciences Source) (EBSCOhost) CINAHL and DOSS (Dentistry and Oral Sciences Source) was undertaken to identify articles on the topic with the assistance of a subject expert research librarian. The text words contained in the titles and abstracts of relevant articles,



and indexed terms used to describe the articles were used to develop a full search strategy (Table 1). The search strategy, including all identified keywords and index terms were adapted for each database and a second search was conducted between January 2024 and May 2024. Reference lists of articles selected for full text review were screened for additional articles.

The boundaries of this review were defined by inclusion and exclusion agreed upon by the reviewers during protocol development and applied identically across databases. Studies satisfying inclusion criteria included: published, peer-reviewed articles specific to IPECP models used in pre-licensure education of dentistry and/or dental hygiene students published in the past 10 years (Jan 2014-present) in English. This date filter coincides with the publication of seminal literature related to the topic.<sup>9,10,24</sup> Non-peer reviewed sources such as grey literature, unpublished studies and commentaries were excluded due to potential risk of reporting bias or conclusion bias in the evidence on IPECP for professional and interprofessional socialization and identity development for oral health students. Studies were limited to English as qualified language interpreters were not readily available and no authors are fluent in languages other than English. Full details of inclusion and exclusion criteria is provided (Table 2).

Studies were deemed eligible for inclusion if they were found to evaluate or explore IPECP experiences used in oral health pre-licensure education or in pre-licensure health education programs broadly, inclusive of at minimum a (1) cohort of dentistry or dental hygiene students. Studies specific to the topic of professional and interprofessional socialization and inter/professional identity development within health professions education and IPECP were included only if a sampling of oral health students was included, to maintain closeness and specificity to the research questions.

## Source of evidence selection

Following the search, all identified records were collated and uploaded into online article tracking software, Covidence™ (Veritas Health Innovation, Melbourne, Australia available at [www.covidence.org](http://www.covidence.org)) and duplicates removed. Following a pilot test, titles and abstracts were screened by two independent reviewers (xx, xx) for assessment against the inclusion criteria. Sources deemed potentially relevant to the topic of IPECP in oral health education were retrieved in full-text and their citation details imported into the software for full-text review by two reviewers. Full-text studies that did not satisfy inclusion criteria were excluded. Reasons studies were excluded included: wrong population (i.e., no dentistry/dental hygiene students or focused on practicing professionals), wrong study design (i.e., pre-program evaluation of students' perceptions of IPC), wrong outcomes assessment (i.e., measuring students' knowledge of health concepts or obtainment of technical skills), and those that only described IPECP theory and/or reported on curriculum design. Any disagreements that arose between the two reviewers at each stage of the selection process were resolved through discussion until a consensus was reached regarding eligibility for inclusion. The results of the search are reported in a PRISMA-ScR flow diagram<sup>28</sup> (Figure 1).

## Data extraction

A modified version of the JBI template, source of evidence details, characteristics and results extraction tool<sup>30</sup> was piloted on a subset of articles deemed eligible for inclusion in the scoping review by a single independent reviewer. Data extracted included specific details about the authors, publication year, country of origin, study aims, participants, IPECP model used,

duration of IPECP experience, study design/methods and key findings or gaps in literature noted relevant to the review questions. All team members were involved in data extraction tool design and piloting and approved appropriateness of the initial design for use in this review. Following piloting and review, data was subsequently extracted from all articles identified as eligible for inclusion and any queries or disagreements that arose during data extraction were discussed and reconciled amongst the entire team. No authors of papers were required to be contacted. Upon completion of extraction, data from articles included were charted and collated into a tabular format for this review (Suppl 1).

### **Data analysis and presentation**

Data analysis was initially completed by a single independent reviewer for preliminary identification of IPECP models used in oral health education, characteristics of experiences, and to identify emergent themes informing the research questions. Independent analysis was followed by group discussion amongst all reviewers of preliminary findings and to thematically categorize the data. All reviewers were involved in data analysis and confirming themes to substantiate rigour in the data interpretation and presentation of findings. Any disagreements that arose during data analysis and interpretation were resolved through group discussion, until a consensus was reached. The charted results of this review are accompanied by a narrative summary addressing review objective and research questions. The authors also identify and summarize gaps in current IPECP models and curricular programming impeding professional and interprofessional socialization for oral health students.

## **RESULTS**

### **Study inclusion**

Database searching identified 321 articles for review. After duplicates were removed (n = 86), 235 articles were screened by title and abstract and 163 failed to meet inclusion criteria and were excluded. A total of 72 articles were subject to full-text review, of which 28 articles satisfied the inclusion criteria and confirmed to be aligned with the research questions as agreed upon by the research team (Table 2).

### **Characteristics of included sources**

Twenty-eight studies conducted in the United States (n = 15), Canada (n = 3), Netherlands (n = 4), Japan (n = 2), United Kingdom (n = 1), Brazil (n = 1) and Australia (n = 2) published between 2015 and 2023 were included in this review. There were 18 quantitative studies, 6 qualitative studies and 4 studies were mixed methods (Supplementary Table).

Eleven studies included a single cohort of dentistry students, and 6 studies included a single cohort of dental hygiene students within IPECP with other professions. The remaining 13 studies included both cohorts, with eight of these studies involving IPECP experiences between oral health students and no other professions. Within the studies involving other health professions, a wide array of professional programs were represented however most frequent collaborators included: medicine, nursing, pharmacy, and social work.<sup>7,31-42</sup>

### **Review findings**

#### ***IPECP models***

Single and multi-format IPECP models were used across studies retrieved. The most commonly described IPECP experiences used or included elements of case-based learning/problem-solving activities and collaborative treatment planning exercises.<sup>7,11,31,33,34,36,38-</sup>

<sup>53</sup> Nine studies<sup>7,31,34,35,39,40,48,49,52</sup> explored multi-model IPECP formats utilizing blended student cohorts in classroom-based lecture, forums, and workshops followed by interactive team activities and simulated practice. Three of the studies reviewed used or included a virtual IPECP format such as online lecture, group discussion and small-group breakout room activities.<sup>11,36,45</sup> Seven studies featured IPECP experiences that involved exposure to real clinical practice, including observation of practicing professionals and direct involvement in clinical patient care and delivery within interprofessional student teams.<sup>32,33,43,51,54-56</sup> Clinical IPECP experiences were described as student led, school-based clinics, and community-based clinical externships (service-learning) under faculty supervision.

The duration of student's participation in IPECP experiences during their pre-licensure education varied significantly. The shortest experience was reported as a three-hour classroom based workshop<sup>49</sup> and the longest experience reported covered a full academic year (two and a half days/week for two terms) in a student-run clinical setting.<sup>55</sup> Five studies did not report details of IPECP duration for students.<sup>33,36-38,50</sup>

### **Characteristics of experiences**

Key characteristics of IPECP experiences were identified and thematically categorized under four major themes: 1) Learning from, and about others, 2) Establishing social connections, 3) Authenticity of experiences, and 4) Consistent socialization and exposure (Figure 2). The following sections describe these characteristics in relation to the review questions.

#### ***Learning from, and about others***

Across several studies, opportunities for oral health students to be exposed to blended (multi-professional) cohort classrooms, activities, and to learn alongside other students were identified as key experiences for facilitating socialization between professions.<sup>7,34,37,40,43,50</sup> Formal socialization within IPECP that included experiences for students to learn from one another- rather than a lecture or faculty facilitator- were reported as more impactful for students' understanding of diverse professional roles and scopes.<sup>7,34,37,40,43,50</sup> Small, interprofessional group activities where students could share how they perceive their roles in relation to patient care were reported as highly impactful for students' professional and interprofessional socialization.<sup>7,34,40,42</sup> Further, these activities were directly identified by participants across several studies as events that enabled exploring how diverse professions may collaborate in practice, without the pressure of direct patient care.<sup>34,42</sup>

Students' understanding of interprofessional collaboration was also identified to be enhanced by peer-teaching opportunities within case-study activities and simulation. Otsuka et al.<sup>37</sup> directly explored the impact of a peer-teaching model for interprofessional socialization and collaboration between dental hygiene, dentistry and medical students. In this study, dental hygiene students were peer-teachers for dentistry and medical students in learning oral care practices for older adults. Post-IPECP participation, all student cohorts reported a greater understanding and appreciation of each other's professional roles and enhanced understanding of the critical need for collaboration between medical and oral health professionals to provide high-quality patient care.

Several studies identified the impact of learning from peers in IPECP for processes of dismantling professional hierarchies and pre-conceived biases about other professions.<sup>37-39,48,50</sup>

Following IPECP participation in Otsuka et al.'s study, medical and dental students reported an increased valuation of dental hygienists and reported higher perceptions of their professional knowledge, skills, and value as a collaborator/team member.<sup>37</sup> Students across multiple studies<sup>37,43,47,48,56</sup> reported that opportunities to share and demonstrate their professional knowledge to others greatly improved their self-confidence communicating and collaborating with other professionals. Mutual opportunities for students to share their professional expertise with others through discussion, applied case-study and simulation experiences, were identified as key characteristics of IPECP activities enabling interprofessional socialization and identity development.

### ***Establishing social connections***

Another key characteristic of IPECP experiences for oral health students was identified as social opportunities to connect with peers.<sup>7,11,38,46,47,53,56</sup> Both formal and informal social events were evidenced to significantly impact how students perceived and experienced collaboration with other professions. Studies identified the significance of students forming connections and friendships as a critical primer for developing collaborative attitudes and behaviours.<sup>7,11,38,46,47,56</sup> IPECP experiences that included 'get to know each other' activities and opportunities for students across professions to interact within a social context (i.e., prior to team-based activities) improved students' preparedness for collaborative teamwork.<sup>7,32,38,39,42,46,56</sup> The results of several studies reported a strong correlation between establishing peer-relationships and more positive student perceptions of interprofessional teamwork overall.<sup>7,32,39,42,46,56</sup> In addition, informal social opportunities were identified as key experiences that enabled processes of bridging professional siloes between professions.<sup>7,42,46,56</sup> Connecting on a peer-level before 'acting' in

their professional role improved students' motivation to participate in team-based activities and engage in interprofessional clinical practice.<sup>46,54,56</sup>

As an example, Langford et al.<sup>42</sup> studied a classroom-based IPECP workshop involving interprofessional team student teams and designated time for new team members to socialize prior to engaging in case-study activities. Post-test scores demonstrated significant improvements in students' attitudes towards collaboration and perceptions of interprofessional teamwork following the IPECP. Asked to report on aspects of the IPECP experience they found most valuable to their learning and preparation for collaborative practice, the majority of students identified socializing with other students and time to connect with their peers. Similar findings were reported by Reinders & Krijen<sup>11</sup> and Reinders et al.<sup>53</sup> whom identified the significant contributions of peer connection and social interaction as a precursor for 'intergroup' formation—characterized by behaviours such as increased cohesion and cooperation between students. Establishing social connections was identified across studies to facilitate the development of a positive team culture and as a strong contributor to students' development of an interprofessional identity.

### *Authenticity of experiences*

The majority of studies also identified a critical characteristic of IPECP events enabling interprofessional socialization and preparedness for collaborative practice as exposure to 'authentic' experiences of collaboration.<sup>7,31,33,34,36,37,39,40,42,45,46,48–50,54–56</sup> Price et al.<sup>7</sup> and Phillips & Keys<sup>31</sup> described the impact of clinical practice observation and rotations through interdisciplinary clinics on student's ability to experience interprofessional collaborative practice 'in action'. Opportunities to witness collaboration amongst diverse professionals in real patient



care settings and scenarios improved students' understanding of professional roles, responsibilities, and how collaboration 'in theory' is translated to practice.<sup>7,31</sup> Observational IPECP models were identified to enable students' exposure to positive role models for collaboration and were identified as important experiences for students' to learn and begin developing behaviours for collaborative practice.<sup>7,31</sup>

In addition to observation, studies identified the importance of hands-on events that provided opportunities for students to be exposed to teamwork and feel 'a part of' a team.<sup>7,33,34,36,42,46,48-50,54-56</sup> IPECP models that included treatment planning activities, practice simulation and patient care were described as authentic experiences of interprofessional socialization and collaborative practice. IPECP experiences that required working together to develop solutions to real clinical problems and patient care challenges were identified to enhance students' professional and interprofessional skills and confidence working within interprofessional teams.<sup>7,31,37,39,40,42,49,50</sup> Oral health students in several studies reported that after experiencing authentic instances of collaboration (simulation and clinical practice) during IPECP, they could better envision themselves working collaboratively in their future practice and reported a higher motivation to seek out interprofessional opportunities.<sup>31,33-36</sup>

However, studies also solidified that successful IPECP experiences for oral health students are contingent on the relevance of the experiences to their practice and expertise.<sup>32,38,41,43,51,52</sup> Positive outcomes of IPECP participation for oral health students was significantly influenced by the level to which clinical case studies and practice scenarios reflected realistic expectations of professional practice, and were inclusive of their professional knowledge and skills.<sup>32,38,41,43,52</sup> Oral health students in several studies reported that they

struggled to see their profession or professional knowledge reflected in the case study activities provided within IPECP alongside other health professions<sup>32,38,41</sup>. Inauthentic and irrelevant practice contexts, settings, and patient care scenarios were identified as major impediments for oral health students to contribute to team decision-making and collaborative care planning activities within IPECP.<sup>32,38,41,42</sup> Students also reported feeling that their profession was a tokenistic rather than intentional, ‘add-on’ to existing IPECP experiences tailored to primary care professions.<sup>32,42</sup> Resultingly, oral health students in these studies reported a lower valuation of IPECP events overall and the contributions of participation to their professional development.<sup>32,38,41</sup> Notably, concerns regarding the authenticity and inclusivity of IPECP design were also reported in studies on IPECP between the oral health professions<sup>43,48,52,55</sup> and not insulated to experiences with other health professions.

### ***Consistent socialization and exposure***

Across studies, peer connection was established as a key characteristic of IPECP facilitating interprofessional socialization and preparing students for IPC. Studies also emphasized the importance of oral health students’ having consistent exposure to other health professions cohorts, IPECP, and collaborative experiences during their education to be effectively socialized to interprofessional practice.<sup>32,34,44,46,47,50,53,54,56</sup> Multi-model IPECP programming, and experiences beyond a single event or timepoint were identified as key characteristics of pre-licensure IPECP that augmented students’ development of collaborative skills, attitudes and behaviours.<sup>11,35,53</sup> In addition, consistent exposure to IPECP and teamwork was reported to enhance students’ respect and appreciation for other professions.<sup>34,35,39,46,54</sup> Consistent socialization and exposure to teamworking greatly improved students’ recognition of

the need for collaborative approaches to patient-care and importance of IPC in practice.

34,35,39,46,54

IPECP models that used interprofessional student teams across multiple timepoints and activities reported higher student preparedness for collaborative interprofessional practice.

34,35,39,48,51,55 Students in Ostroki Olssen's<sup>54</sup> study were assigned to an interprofessional student team providing clinical care in a community-based, service-learning model over a duration of four months. Post-IPECP experience, students across professions reported positively on the IPECP experience for facilitating socialization and mutual understanding of roles and responsibilities. Consistent exposure to other professions also better allowed students to overcome conflicts to collaboration and evolve collaborative skills.<sup>34-36,39,54</sup> Repeated opportunities to discuss and resolve differing values and professional opinions as a team improved collaboration and effective team functioning across the duration of students' interprofessional collaboration experiences.<sup>34,39,54</sup> Frequent socialization and exposure to IPECP was found to positively influence health professions students' understanding of oral health professionals' roles and contributions to care, and also augment oral health students' self-perception as an interprofessional practitioner.<sup>34</sup>

However studies also identified barriers for developing a collaborative, interprofessional identity, reporting that oral health curriculum remains largely profession-specific.<sup>31,38,41,44,46,51,54,56</sup> Many studies identified that current oral health curriculum provides few opportunities for students to develop and cultivate skills for interprofessional collaboration beyond what may be provided in often time-limited IPECP<sup>31,38,41,44,46,51,54,56</sup> For studies that involved oral health students in IPECP longitudinally, the majority reported significant

improvements in collaborative attitudes, teamwork skills and behaviours, and a higher preference for IPC in their future practice.<sup>34,44,50</sup> Furthermore, oral health students in the majority of studies directly reported that their professional development and preparedness for collaborative practice could be enhanced by more consistent IPECP and collaborative experiences throughout their programs.<sup>31,33,40,42–44,46,47,56</sup>

## DISCUSSION

This review identified models and characteristics of IPECP experiences enabling professional and interprofessional socialization and identity development for oral health students. In addition, this review provided important insights on critical elements of IPECP experiences that can best enable fostering a collaborative interprofessional culture between learners and the oral and health professions. Opportunities for socialization and peer connection are identified as critical characteristics of IPECP experiences enhancing oral health students' engagement with other professions and development of collaborative attitudes, values and behaviours for interprofessional practice.<sup>7,34,37,40,43,50</sup> Moreover, our findings highlight the positive impact of consistent socialization and exposure to interprofessional teamwork during students' pre-licensure education. IPECP experiences embedded within the curriculum and threaded throughout students' formal program years are identified to best prepare oral health students' with the skills and confidence to be a collaborative, interprofessional partner.<sup>34,35,39,46,54</sup> Our review also identified that students expressed a desire for additional interprofessional experiences and exposure to IPECP models.<sup>31,33,40,42–44,46,47,56</sup>

These findings are consistent with emerging evidence in the fields of social psychology and professional identity theory that identifies frequent social contact between members of

different professions as a catalyst for dismantling hierarchies and enhancing patterns of communication between professionals.<sup>11,53</sup> Consistent socialization is evidenced to build emotional attachments and can contribute to a sense of psychological safety that enhances individuals' commitment to a team, collaborative behaviours and supports higher team performance.<sup>11,57,58</sup> Consistent social contact and exposure to teamwork within IPECP during pre-licensure education stand as critical contributors to interprofessional identity formation and the preparation of oral health students for interprofessional collaboration in practice.

While positive developments have made in recent years for increasing oral health students' exposure to, and involvement in IPECP programming,<sup>59</sup> our review has also identified barriers for students' development of an interprofessional identity within existing models. Targeted areas for IPECP development in oral health education include a need for increased collaboration between health programs, directors and educators to co-create IPECP experiences for students that are professionally inclusive. Review and revision of current IPECP programming to ensure that case studies and team-based activities authentically reflect, and intentionally drawn upon the professional knowledge of all student participants is another key recommendation from this review.

In addition to more IPECP programming, our review also identifies a need for oral health programs to re-evaluate the current clinical settings of oral health education.<sup>41,43,46,56</sup> Oral health students across studies identified the clinical settings of their programs as a limiting factor to their interprofessional socialization. Studies also reported on difficulties for oral health students to connect with their team members during IPECP as they seldomly saw collaborative attitudes and behaviours role modelled in their education or had exposure to interprofessional teamwork.<sup>41,51,56</sup> These findings highlight a need to evaluate how current clinical training models

in oral health education may be reinforcing a hidden curriculum. Hidden curriculum refers to values, morals and behaviours that are not explicitly taught in education programs, but observed and learned informally through exposure to individuals and settings.<sup>60</sup> Faculty members and professional mentors may be unconscious contributors to reinforcing attitudes and behaviors that counter collaboration. Biased attitudes, and beliefs masked as core professional values, risk becoming engrained as part of students' professional identity during formative years of development.<sup>60,61</sup> Hidden curriculum within oral health education and in extension to IPECP programming for students risks the perpetuation of uni-professional identities and practice culture that directly contend with the intended goals of IPECP; to develop collaborative practitioners and effective interprofessional teams in the future.

## **FUTURE RESEARCH AND CONCLUSION**

This comprehensive scoping review has identified key models and characteristics of IPECP experiences for oral health students' providing direction for future IPECP development and informing areas requiring further research. Specifically, there is a need for more qualitative research on the topic to better contextualize the experiences of oral health students' within IPECP and identify specific contexts, settings and scenarios that are most impactful for interprofessional socialization and identity development. In addition, both longitudinal IPECP experiences and longitudinal research that follows students' interprofessional development throughout their pre-licensure education is needed. Longitudinal analyses stand to improve our collective understanding of the contributions of IPECP and current learning environments in oral health education to students' readiness for interprofessional collaboration upon entry to practice. This knowledge is crucial to the development and implementation of innovative strategies to enhance

IPECP across oral and health education programs that better supports IPC and effective care delivery in practice. Research specific to explicit learning outcomes of IPECP within oral health education is an area of future focus.

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### **CONFLICTS OF INTEREST**

The authors declare no conflicts of interest. As a well-published expert in the field of interprofessional education in the health professions and professional/interprofessional socialization, [xx] was not involved in the screening or text review of articles for inclusion in this review.

### **List of Abbreviations**

**DDS-** Doctor of dental surgery

**DH-** Dental hygiene

**IPE-** Interprofessional education

**IPECP-** Interprofessional education for collaborative practice

**IPC-** Interprofessional collaboration

**OH-** Oral health

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## Tables and Figures

**Table 1.** Database Search Strategy

	<b>Search</b>
1	Dentistry OR dental hygiene
2	( inter-disciplinary OR interdisciplinary ) OR ( multi-disciplinary OR multidisciplinary ) OR ( interprofessional OR inter-professional ) OR ( intra-professional OR intraprofessional ) OR collaborat*
3	“professional identity” OR social*
4	S1 AND S2 AND S3 Limiters- abstract available; 2014-01-01-current; Scholarly (Peer Reviewed)

**Table 2.** Inclusion and Exclusion Criteria

<b>Inclusion</b>	<ul style="list-style-type: none"> <li>• Peer-reviewed journal articles</li> <li>• Published in the past 10 years (2014-present)</li> <li>• English language</li> <li>• IPECP<sup>a</sup> models used in pre-licensure education of dentistry and dental hygiene students</li> <li>• IPECP models used in pre-licensure education of health professions students that include at minimum one (1) cohort of dentistry or dental hygiene students</li> </ul>
<b>Exclusion</b>	<ul style="list-style-type: none"> <li>• Non-peer reviewed articles, grey literature</li> <li>• &gt; 10 years since publication</li> <li>• Language other than English</li> <li>• Studies exploring IPECP models in health professions pre-licensure education that do not include a cohort of dentistry or dental hygiene students.</li> <li>• Studies exploring IPECP models used amongst practicing oral/health professionals</li> <li>• Studies exploring IPECP models from perspective of educators/program administrators/quality assessment or curriculum design.</li> </ul>

<sup>a</sup>IPECP: Interprofessional education for collaborative practice

Figure 1. Adapted PRISMA-ScR flow chart<sup>a</sup>

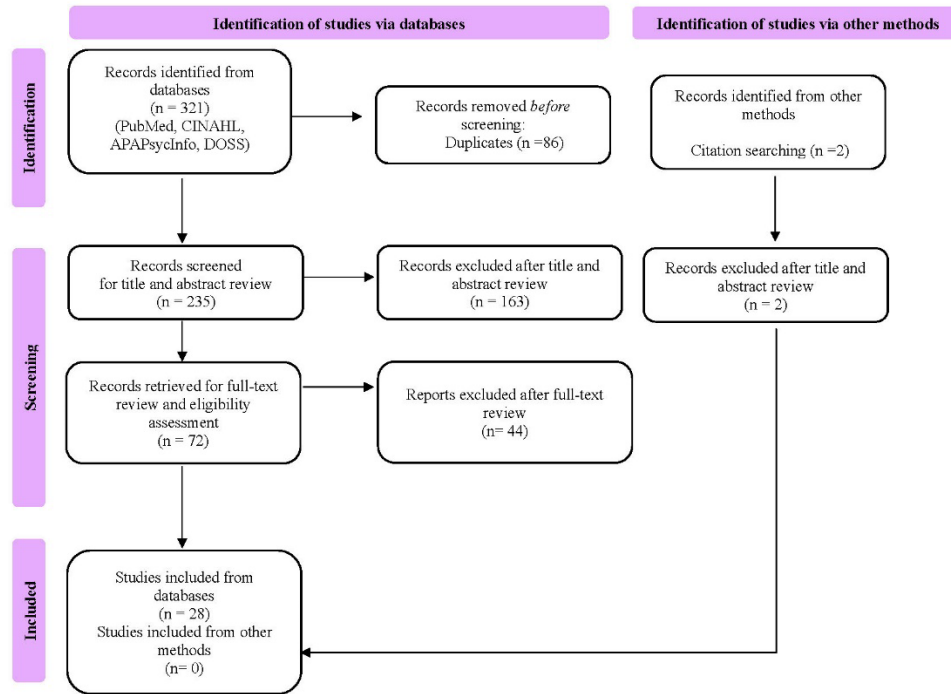
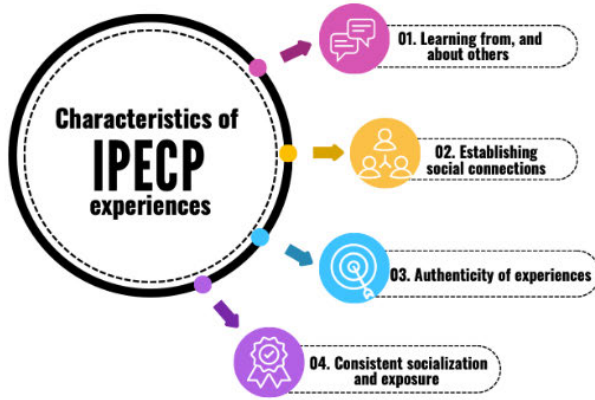


Figure 7; a\_Adapted from Page MJ, McKenzie JE, Bossuyt PM, Boutron J, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;372:n71. doi:10.1136/bmj.n71

**Figure 2.** Characteristics of IPECP experiences enabling professional and interprofessional socialization, identity development and preparedness for collaborative practice for oral health students<sup>a</sup>



a- IPECP: Interprofessional education for collaborative practice

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