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Title: Interprofessional Education in Dentistry

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Aim: To introduce the reader to the concept of interprofessional education as an aspect of dental education.

Abstract:

A collaborative health workforce is required to respond to the increasing demands on healthcare resources. Various national and international bodies are promoting interprofessional education (IPE) as a method to provide this collaborative health workforce. IPE is therefore becoming increasingly prominent within healthcare training and will be an essential aspect of dental education. A literature search was completed to provide this narrative review which will introduce IPE, discuss the rationale for IPE within dentistry and the challenges faced. Based on current literature, it will provide practical advice on how to implement an effective IPE learning activity within dentistry.

In Brief:

- Interprofessional education is increasingly being promoted as a key aspect of undergraduate and postgraduate dental education.
- The rationale for interprofessional education, effectiveness and challenges faced are discussed.
- Practical advice is given to enable the reader to introduce and facilitate successful interprofessional education learning events.

Introduction:

Present and future health workforces are facing increasing pressures in terms of the demand on health resources and increasingly complex health issues. The World Health Organisation (WHO) recognizes that many health systems throughout the world are fragmented and struggling to manage health needs.[1] Interprofessional Education (IPE) is an essential step towards a collaborative health workforce that is competent to work within interprofessional teams and is better prepared to respond to local health needs.[1] The Centre for the Advancement of Interprofessional Education (CAIPE) recognizes IPE as 'occasions when members or students of two or more professions learn with, from and about each other to improve collaboration and the quality of care and services.'[2] This collaborative practice can involve multiple health workers from different professional backgrounds working with patients, families, carers and communities[1]. Figure 1 demonstrates how IPE and collaborative practice can lead to improved oral health outcomes.

Figure 1 – The impact of IPE on collaborative practice and improved oral health outcomes. Adapted from Health and Education Systems from Framework for Action on Interprofessional Education and Collaborative Practice[1]

'Learning from, with and about each other' implies collaboration, interactive and equitable learning[3]. Many learning theories underpin IPE, in particular Wenger's communities of practice[4]; groups of people with a shared concern, interacting regularly and ultimately learning how to improve what they do[5]. IPE is not new to dental education but in recent years the incorporation of IPE within dental education has increased. Reflecting this, the General Dental Council (GDC) describes the opportunity for students to train and work with other dental professionals as a key responsibility of education and training providers[6].

This narrative review aims to introduce IPE as an aspect of dental education. A literature search was carried out using the electronic database MEDLINE using the following terms 'interprofessional', 'multiprofessional', 'multidisciplinary' in combination with 'learning', 'education' and 'dental'. Boolean operators and truncations were used to allow for variability of terms in the literature. Relevant papers were also identified from a hand search of the Journal of Dental Education, European Journal of Dental Education and from the reference lists of relevant papers. The search focussed on literature published between 2000 and 2018. This narrative review will discuss IPE, its rationale within dentistry and effectiveness. There are a number of challenges faced in delivering effective IPE and therefore the latter half of this paper will provide the reader with practical advice

when developing an IPE learning session within dentistry, based on an example of medical emergencies training for the dental team.

Rationale for Interprofessional Education:

The development of IPE has been linked to a desire to improve patient care through improvement in IPC and teamwork[7]. These drivers include government policy, professional regulators and at a local level; IPE champions and organisational support[7]. Various international and national bodies within healthcare now promote and support interprofessional collaboration (IPC). The underlying rationale for IPC is to address the increasing demands on healthcare, the complexity of health issues within the population and the change in focus on health promotion[3]. IPE has been identified as an essential step towards this collaborative healthcare workforce[2]. Within dentistry, there are a number of recent changes and demands on the dental workforce that support the need for IPC such as an increasing aging population, emphasis towards a preventive programme and the introduction of managed clinical networks. Many older patients with complex medical conditions, comorbidities and polypharmacy are retaining their natural dentition and so are presenting with more complex oral health needs. An interprofessional approach in the management of these patients quite often extends outside the dental team to include other healthcare teams such as medical and social care. With high numbers of children with caries requiring hospital admission, the introduction of dental contract reform has shifted emphasis more towards that of a preventive programme. This shift will inevitably mean that IPC amongst the dental team in particular hygienists, therapists and oral health educators is essential. Finally, with the NHS aiming to remove the traditional divide between primary and secondary care by promoting networks of care integrated around the patient[8,9] the introduction of managed clinical networks within dentistry will rely on IPC amongst all members of the dental team including those at general, specialist and consultant levels and across dental specialties to provide efficient and effective patient care.

Whilst it is acknowledged that across the NHS, people work and learn together, it was identified that this implicit, informal interprofessional learning is not always recognized and that this learning opportunity should be made more systematic and explicit to harness its true potential[10]. In 2001, the Department of Health produced a framework for lifelong learning entitled 'Working together-learning together'[10], the title alone suggesting an emphasis on IPE. IPC is promoted within one of the General Dental Council (GDC) nine principles 'work with colleagues in a way that is in patients' best interests'[11]. Another of these principles addresses the need for the dental team to maintain and develop their skills and knowledge[11]. Whilst these standards don't explicitly state the need for IPE, they apply to the whole dental team and suggest the importance of IPC and continued learning to

ultimately improve patient care. These principles align with that of the NHS lifelong learning framework[10] and CAIPE's theory[2].

What is Interprofessional Education?

CAIPE's definition of IPE is 'occasions when members or students of two or more professions learn with, from and about each other to improve collaboration and the quality of care and services.'[2] The key aspect of this definition is 'learning from, with and about each other' implying collaboration, interactive and equitable learning[3.] Many other terms have been used in the past such as multiprofessional education and multidisciplinary education. With growing use of IPE as a term for collaborative learning, the term multiprofessional is now recognized as different professions learning together in a parallel manner rather than collaboratively[12] often because there is a common purpose to address particular learning content[13 p82]. This shared listening alone is not believed to be effective interprofessional learning[14]. If the value of interprofessional learning is not conveyed to learners in multiprofessional sessions, then this can lead to resentment and each professional group feeling their learning is not as significant as it would be in a uniprofessional setting[13 p82]. Therefore, the key to effective learning within IPE is interactive, collaborative learning where all learners learn with, from and about each other.

IPE – pre-registration or post-registration?

There are conflicting views as to whether IPE should be introduced early into a pre-registration programme. Pre-registration uniprofessional curriculums are often pre-established, structured curriculums with profession specific learning activities[3]. The logistics of then trying to introduce IPE, for often a large number of students with complex curriculum timetables can be challenging, particularly if not all staff appreciate the value of IPE. It has been found that schedule coordination (92%) and curriculum overload (76%) were issues when implementing IPE within a dental hygiene curriculm[15] and that support from educational leaders and administrators is essential[7]. There is also thought that pre-registration students should be focussing on developing their uniprofessional skills and professional identity prior to learning collaboratively as part of IPE. In contrast to these views, pre-registration IPE can heighten students' appreciation of safe and good practice whilst creating opportunities to explore ways in which their professions can work together more effectively to respond to the complex needs of the population.[16] The GDC states that the opportunity to develop in a team environment as early as possible within pre-registration training is essential so that potential registrants recognize the association between good quality teamwork and the quality of care the team provides early into their training[6]. The GDC sets overarching learning outcomes for

pre-registration training for the whole dental team; including dentists, therapists, hygienists, dental nurses, and dental technicians with domains consistent across professional categories.[6] Whilst having these domains across professions should allow opportunities for dental team integration and effective team work[6] it does not automatically result in effective IPE. Students often respond more positively and see more relevance when learning with professions with whom they anticipate working with after qualifying; this may be difficult when those professions are taught in different insitutions.[16] The GDC state that opportunities for students to train and work with other dental professionals is a key responsibility of education and training providers[6]. The potential for IPE within an institution where various members of the dental team and other healthcare professionals train together should be harnessed and made explicit wherever possible.

The GDC pre-registration learning outcomes[6] align with the standards required of a registered dental professional[11]. As registered dental professionals already work within healthcare teams, it is argued that IPE learning activities should be easier to implement[3]. However, there are still challenges regarding logistics and organisation of different groups of professionals with different clinical commitments and demands. At postgraduate level, IPE is reflected in the foundation training curriculum[17] outcomes; understanding the scope of practice of dental care professional groups and how the dynamics of interprofessional working can contribute to quality of patient care. Many specialty training curriculums also refer to effective communication and working within a multi-professional team[18-21]. Learning opportunities for IPE within postgraduate training curriculums should be clearly identified alongside assessment methods to align with these learning outcomes. Registered dental professionals not within a postgraduate training programme follow standards[11] and CPD requirements[22] set out by the GDC. Their professional development plan (PDP) is ultimately driven by their perceived learning needs. Unfortunately, some may perceive IPE as not relevant to their profession and 'diluting' down the potential learning for the skills and knowledge they need to gain. However with the introduction of enhanced CPD[22], dental care professionals are encouraged to choose CPD covering all four development outcomes; two of which include effective communication and work within the dental team and across healthcare.

Effectiveness of Interprofessional Education

The overarching aim of IPE is to promote a collaborative workforce and improve the quality of care and services, however, the number of studies reporting outcomes in relation to patient care and service improvement is limited. A recent systematic review[7] of the effects of interprofessional education included a total of 46 studies within which medicine and nursing were the two professions who most frequently share their IPE experiences together. Of those 46 studies, only 14 studies

reported on the changes to organisational practice as result of IPE, of which 11 studies reported positive outcomes. With regards to patient related outcomes, only 11 studies reported this with 9 studies reporting positive outcomes.[7]

Reeves et al[7] identified fewer studies involving dentistry within IPE however the evidence base in dental education is increasing. The experiences of pre-registration student dentists, dental hygiene and therapy students and first-year dental nurses with regards to IPE in Portsmouth, found that all students had positive attitudes towards IPE and each of the three groups reported that IPE enhanced teamwork and development of professional relationships.[23] An IPE event involving dental students and student doctors of nursing practice[24] found that students were respectful of each other's roles and effectively engaged with each other to develop strategies to meet the patient's needs. Within the UK, dental students and student dental technicians linked together in the provision of dentures for a patient, resulted in the majority of students recognizing the benefits of shared learning and valuing the roles of team members, the acquisition of teamwork skills for their future careers and ultimately improving patient care[25]. Whilst general health profession IPE findings can be related to dentistry, further research in IPE within dentistry would be ideal in particular reporting outcomes in relation to patient care and service improvement.

Challenges

There can be specific challenges faced when organising an IPE learning event such as learners' pre-conceived beliefs and attitudes towards IPE. In the past multiprofessional events have been run as passive learning, not harnessing the potential of interactive learning, therefore learners may have had a negative experience of 'multiprofessional learning'. Professional stereotypes and hierarchies can impact IPE learning events[7] which can be a barrier to communication and interaction by all members of the IPE event. Some professions may dominate the interaction, whilst others may be reticent to contribute. An experienced facilitator is essential and learning together can reduce this prejudice; cultivating mutual awareness, trust and respect in readiness for collaborative practice.[16] Tutor and faculty attitudes have been identified as a barrier against IPE in Dental Education including resistance to change, lack of interest and perceived lack of credibility of IPE.[26] Administration, faculty and staff must value and support IPE for it to be successful.[26] A national survey of healthcare IPE educators identified that people felt the need for all staff from all professions to commit to the same ethos of IPE.[27]

IPE is best planned collaboratively involving educators from the relevant professions; this can be a complex process considering different professional and educational backgrounds and then

determining how, where and when to introduce IPE.[16] If there is limited organisational support for IPE events, this usually results in problems accessing resources such as time, space and finances for IPE.[7] This lack of administrative support has been identified as a barrier to IPE within dental education, in addition to the perceived lack of IPC training to teach or assess IPE.[26]

Designing an IPE learning activity within dentistry

Based on current literature, practical advice on how to overcome some of the challenges faced when planning and implementing an IPE learning activity within dentistry will be discussed. A conceptual example of medical emergencies training for the dental team has been used.

Learning outcomes

Learning outcomes for IPE need to align with the overarching GDC outcomes[6,11]. The GDC refers to effective communication amongst colleagues for the direct care of patients, whilst appreciating the role of feedback to and from members of the team[6]. These outcomes run through all domains and apply to all registration categories. To reflect collaborative learning, learning outcomes should be such that they are unlikely to be achieved without interprofessional interaction[3]. Figure 2 gives an example of learning outcomes that could be used for an IPE event involving simulation of a medical emergency within a dental clinic. These learning outcomes align with that of the GDCs preparing for practice[6]. Bloom's taxonomy[28] and Millers Pyramid[29] were considered, in this situation demonstrating 'shows how'[29] and 'understanding and application' of knowledge and skills[28].

Figure 2 – Example of learning outcomes for an IPE event involving simulation of a medical emergency within a dental clinic.

Infrastructure & Facilitator

When setting up an IPE learning activity, consideration needs to be given to location, facilities, facilitator, funding and the group of learners. It is important to establish a comfortable learning environment, where learners are able to receive feedback and discuss in a 'blame-free' environment[14,30]. The facilitator has an essential role in creating a climate of safety and confidence amongst learners.[7] Medical emergency simulation within the dental team's surgery can make the learning as authentic as possible in an environment learners are comfortable with.

There needs to be some consideration as to whether the facilitator should be an up-to-date clinician with skills and knowledge in that subject area or a facilitator with specific skills in IPE. Facilitators enable students from different professions to enhance each other's learning, however this can be challenging when confronted with students from diverse backgrounds.[16] A facilitator who is able to

work creatively with small groups with knowledge of the relationship shared by professions is important[14]. The role of the facilitator is to observe learner interaction and collaboration, giving feedback on the team process and facilitating reflection on roles within the team[3]. As an interprofessional role model, the facilitator must maintain professional neutrality and respond to the dynamics of the group diplomatically as they encourage interprofessional learning.[16] Facilitators need development opportunities to ensure they have an understanding of educational theory linked to IPE[7] and the need for national standards for IPE facilitation has been suggested to guide staff development and long term IPE sustainability[27.] For medical emergencies training, a facilitator with the subject knowledge and training in facilitating IPE activities would be ideal. The challenge can be when IPE activities involve a number of different disciplines with different specialist knowledge. In these cases, Freeth suggests interprofessional co-facilitating however with this comes increased cost, organisation and tutors need to role model high quality IPC[13 p89]. Co-facilitating can enable facilitators to compare evaluations of the group's progress and offer mutual feedback.[16] However, different professionals commitments can conflict with each other meaning scheduling can become very complex.[26]

Interprofessional team

A decision needs to be made as to which professions to invite to the session. A significant advantage of peer learning is that learners bring their own unique values, thereby effective learning is promoted by learners interacting. The GDC acknowledges that all members of the dental team contribute to the patient's experience of dental treatment[6]. Linking this to Wenger's communities of practice theory[4], this dental team can be perceived as the community of practice all working towards optimum patient care; working and learning together. The GDC extends this community of practice to effective working with other healthcare professionals and other sectors[6]. Extending the community of practice even further, the GDC point out that learning outcomes are to be responsive to changes in public expectations and current/future oral health needs[6]. Considering this, learners can be from many different professional groups including those of other healthcare professionals and even patients or public involvement. The essential aspect is designing a learning activity that is relevant to the learner groups attending to promote collaborative learning. In this example of medical emergency training, all members of the dental team can be involved; dentists, nurses, hygienists, receptionists and practice managers. This community of practice can also be extended further to include healthcare professionals with specific experience/skills in medical emergencies such as paramedics or A&E staff, quite often these members can be the facilitator of the session.

Learning activities & learning theories

With everyday clinical work, informal IPE exists through collaboration such as team work in the management of patients and meetings such as multidisciplinary team meetings (MDT). However, with increased pressures on clinical time, quite often these experiences are overlooked and IPE is not optimised. Therefore, there is strong justification for formalising IPE making these learning opportunities more defined. IPE is more coherently planned, consistently delivered and effectively reported when it is explicitly underpinned with learning theory.[16] When planning a formal IPE activity, it is important to consider principles of adult learning as these are key mechanisms for well received IPE[14]. Firstly, it is important to identify learners' prior knowledge and experience. Learning is more effective when new knowledge is built upon previous knowledge[31]. Facilitating learners to identify their current knowledge, also allows them to identify their own learning needs which will trigger the learner's intrinsic motivation[30]. However, with IPE activities, the facilitator needs to be aware that more effort is needed to find out past experiences and knowledge of participants as these may differ significantly amongst learners[13p89]. Through valuable peer learning, learners can discuss different experiences and skills, thereby learning is enhanced whilst having the potential to enhance positive attitudes to others[14]. This discussion amongst peers can often be informal and at times such as refreshment breaks and this could be perceived as an aspect of the hidden curriculum; learning which falls outside of the formal curriculum[32].

Learning is effective when learners can apply learning to their daily practice[30]. Therefore, authentic case-based examples or simulation are ideal methods for IPE. It has been identified that working with simulated patients provided a powerful learning experience[14]. In an example of IPE involving dental students and student doctors of nursing practice, simulated patients with chronic medical diagnosis and orofacial symptoms promoted effective IPC[24].

In a national survey, 58% of interprofessional educators in the UK incorporated technologically enhanced learning (TEL) into health care courses[27]. For medical emergencies training within the dental team, technology enhanced learning (TEL) could be used prior to the session. A quiz could be completed online by learners before the event, to assess existing knowledge and identify areas of learning need for each learner, directing them to resources If necessary before the event. Case based learning, experiential learning and simulation were all commonly reported learning methods used by interprofessional educators.[27] Simulation is an ideal method for medical emergency training. Each member can develop their skills through a variety of medical emergency situations. Feedback can be discussed and facilitated whilst learners continue to practice their skills in different situations; methods that have been found to facilitate learning using high-fidelity medical simulations[33]. The key learning theories that apply here are reflective learning[34], communities of practice[4] and self-

efficacy[35]. Learners can practice and develop their skills with guidance, working and observing others will heighten their confidence and develop their skills until they are confident (mastery experience)[35]. Interprofessional learning can be maximised during the debrief following simulation, the facilitator can deepen students' learning by encouraging focused reflection on the interprofessional working processes in the situation they have just enacted.[16] The group of learners reflect upon and discuss their performance and try to establish roles and how they can improve management of the emergency situation. Ultimately, the dental team, as a community of practice[4], are learning through experience and practice whilst belonging and becoming an effective team in the management of medical emergencies.

Assessment

Assessment can check if learning has taken place and also promote the value or importance of IPE to the learner. It is important to consider constructive alignment[36] when devising assessment methods, ensuring that assessment aligns with learning outcomes; based on demonstrated competencies for collaborative practice.[16] Outcomes can be assessed at team level rather than individual level in IPE events[13 p91]. At a team level, formative assessment can be carried out within this example, giving immediate feedback following the medical emergency simulation. Summative assessment can promote more value and importance of IPE to the learner[16] but can be more challenging on a team level. A decision needs to be made whether to provide the same summative mark for the whole group, or to adapt the group mark according to each individual's ability and contribution. The assessment method and criteria should be consistent across professions.[37]

Within the GDC Standards for Education[38]**,** it is proposed that assessment must utilise feedback collected from a variety of sources including members of dental team, peers, patients +/- customers. Multisource feedback is a requirement of postgraduate dental foundation and specialty training as a form of both formative and summative assessment. IPE activities can be a key opportunity for multi-source feedback. In this example, formative (and summative) assessment can be included at the end of the session in terms of a multisource feedback via TEL and learners could be required to contribute to an online 'wiki' or document defining each individual's role in the management of a dental emergency to assess learning and then use in practice, ultimately promoting patient safety and care.

Evaluation

In a national survey, 81% of healthcare IPE educators reported to evaluate their IPE learning sessions, these methods of evaluation included questionnaires, surveys and a staff/student

consultative committee[27]. Relatively few IPE interventions are subject to independent research[16] and this is an area for further research. In this context of medical emergency training, a simple evaluation feedback form can inform course providers in order to improve sessions further.

Conclusion

With increasing demands and pressures on dental services, there is a need for an interprofessional and collaborative approach in the management of our patients, quite often extending outside the dental team. Within this paper the rationale for IPE within dentistry to promote IPC and ultimately improve the quality of patient care has been highlighted. Whilst there are significant advantages of IPE in promoting a collaborative workforce, it is important that interactive learning is facilitated rather than passive learning of groups together in one room. An IPE learning event requires careful planning and effective implementation to harness the potential advantages of interprofessional learning. Based on the literature reviewed, ten top tips to consider when planning an IPE event have been devised in Figure 3. Underlying learning theory for IPE has been discussed including principles of adult learning[30], reflective learning[34] and communities of practice[4]. Whilst there is need for further research in this area, there is increasing importance of IPE within dental education and this practical guide has aimed to explain the rationale for IPE within dentistry and how this can be effectively implemented within dental education.

Figure 3 **- Ten Top Tips for Interprofessional Education in Dental Education**

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