INTERPROFESSIONAL EDUCATION

Health professional students' emotional responses to effective and ineffective teamwork

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Abstract

Introduction: Pre-registration students learn interprofessional competencies for effective teamwork through interprofessional education (IPE), yet they do not always see effective teamwork in the clinical workplace or experience it in IPE learning activities. In this study, we explored: (1) what students recall of experiences of interprofessional teamwork interactions in workplace settings or in IPE learning activities and (2) what and how they describe the emotion attached to these experiences.

Methods: A pre- and post-test survey design was used, which included qualitative questions administered before and after a clinical workplace-based cancer and life-limiting illness IPE activity for two cohorts of students. We surveyed students about teamwork experiences in both workplace and IPE learning activities and how they felt about them emotionally. A content and thematic analysis was undertaken, the latter using a process adapted from Attride-Stirling (2001).

Results: For the *before-IPE* responses, 31 out of 50 students in the two cohorts responded (62%), and for the *after-IPE* responses, 29 out of 50 in the two cohorts responded (58%). There were two global themes: (1) students readily recognise both effective and ineffective teamwork and (2) ineffective teamwork experiences can evoke strong emotional responses.

Conclusion: Students' emotional responses from being involved in or observing effective and ineffective teamwork may influence their future engagement in interprofessional teamwork and IPE activities.

Keywords: emotion; hidden curriculum; interprofessional education; pre-registration; reflection; teamwork

Introduction

Effective interprofessional teamwork, where different health and social care disciplines jointly contribute their skills to patient care, has many benefits for healthcare (Pomare et al., 2020; Schmutz et al., 2019), while also enriching the professional work environment

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(Schot et al., 2020; Seaton et al., 2021). Pre-registration students learn interprofessional competencies that enable collaborative teamwork through interprofessional education (IPE) (Institute of Medicine, 2015; Reeves et al., 2016). However, students do not always see professionals working effectively in clinical teams in the workplace (Leedham-Green et al., 2019; Thomson et al., 2015). The workplace is believed to be the "most influential learning environment" (Weurlander et al., 2019, p. 1038), as it offers learners multiple social possibilities for learning from a variety of disciplines (Dornan et al., 2015). Yet it can also reveal a hidden curriculum (Giroux & Penna, 1979), where there is a contrast between what is taught and what is observed, and for some students, this cognitive dissonance (Aase et al., 2014) can cause emotional distress (McCloughen et al., 2020).

Emotion is a necessary and important response to the healthcare of patients and healthcare delivery (McNaughton, 2013) and is similarly important in education and for learning (Ajjawi et al., 2021). Education researchers have traditionally viewed emotion as influenced by valence, intensity and activation (Ingleton, 1999; Talarico et al., 2004). Valence is the emotional state ranging from positive to negative; intensity refers to strength; while activation indicates arousal and ranges from activated to deactivated (Talarico et al., 2004; Tyng et al., 2017). Intense emotional events are recalled more accurately and for longer than "neutral" events (Talarico et al., 2004; Tyng et al., 2017), with emotional responses (particularly negative responses) having the power to change cognition and behaviour (LeBlanc et al., 2015). Emotional responses influence the coordination of an individual's thoughts and actions (LeBlanc et al., 2015), impact on decision making (Artino & Naismith, 2015) and shape the development of a discipline-specific identity (Dornan et al., 2015).

Reasoning is often contrasted with emotion as being a higher-level learning skill, with distressing emotions needing to be controlled and overcome, or at least not talked about (McNaughton, 2013). Yet emotional responses to both positive and negative events are now recognised as necessary and central components of student learning and engagement (LeBlanc et al., 2015; Mills, 2022), with agreement that emotion not be avoided even if it prompts a negative response (Ajjawi et al., 2021; Talarico et al., 2004). However negative emotions that result from seeing or being involved in ineffective or even unprofessional staff behaviour without any form of debriefing may be detrimental and result in uncertainty and powerlessness (Weurlander et al., 2019) and perceived values clashes (Dornan et al., 2015) and cause isolation and burnout (McNaughton, 2013).

Dadich & Olson (2017) undertook a qualitative study of emotions in relation to interprofessional workplace healthcare, including pre-registration students. They concluded there was a professional culture clash of views regarding expression of emotion and that emotion could either facilitate or stymie interprofessional practice, the latter if "open negotiation" was quashed in preference to tact. Mohr et al. (2021) studied the emotions of nursing and medical students taking part in an IPE activity in a clinical setting but working on simulated cases. They found large variations in positive moods

and some variation in negative moods experienced within and between students (Mohr et al., 2021). Neither of these studies examined if and how emotion was recalled, expressed and described by students after undertaking workplace interprofessional teamwork or IPE activity or any consequent impact.

This current study was undertaken with a group of students taking part in a cancer and life-limiting illness IPE learning activity, a well-established and quality improved immersive clinical workplace-based activity based in a hospital setting (McKinlay et al., 2021; McKinlay et al., 2018). The aims of this study were to explore: (1) what students recall of previous and current experiences of interprofessional teamwork interactions in workplace settings or in previous or current IPE learning activities and (2) what and how they describe the emotion attached to these experiences.

Methods

Context of the study

The cancer and life-limiting illness IPE initiative is an 8-hour learning activity undertaken in several sections over 8 days in a hospital workplace setting that offers tertiary care cancer services—the IPE initiative, and intended learning outcomes, is described in another paper (McKinlay et al., 2018). It involves 26–30 final-year students, from a variety of healthcare disciplines and institutions, taught by an interprofessional team, including clinical tutors in the workplace and from nearby education facilities. Students attended an introductory workshop, which included a brief section on the impact of the hidden curriculum (when what students see in the clinical workplace or experience in learning activities is not what is taught). On another day, they met with selected patients (either in person or via Zoom) in small interprofessional learning teams. Following this, in their teams, they prepared oral presentations about each patient. Finally, at a second workshop, the teams of students presented about patient management and included their own experiences of working in small learning teams.

Participants

Two cohorts of final-year health professional students from allied health, medicine and nursing (September 2020 and September 2021) volunteered to take part in the cancer and life-limiting illness IPE activity. Students were from several tertiary institutions and some, but not all, had had previous IPE learning activities in earlier years of training. Two cohorts were included to increase the sample size to increase the credibility of the findings. There were 26 participants in 2020 and 24 participants in 2021 (see Table 1).

Students were invited to optionally take part in this research study. The study was approved by the University of Otago Ethics Committee, Ethics B process (D17/108). Students were sent an information sheet in advance and consented through participation in online surveys.

Table 1

Participants in the Study

Discipline	2020	2021
Dietetics	2	1
Medicine	12	7
Nursing		3
Physiotherapy	9	5
Psychology		3
Radiation therapy	3	2
Social work		3
Total participants	*26*	*24*

Procedure

The pre- and post-IPE activity surveys designed by the authors were pretested for understandability and administered through Qualtrics™. They included quantitative and qualitative questions and information on participation in previous IPE activities for a wider teaching evaluation. This paper reports on the qualitative data. We used a pre- and post-test design to explore whether students who came into the IPE activity had experienced positive or negative emotions through taking part in or seeing teamwork in the clinical workplace or from having taken part in past IPE activities (pre survey) and then to see if taking part in the current IPE activity had elicited an emotional response (post survey). The post survey was undertaken immediately after the IPE activity was completed and differed from the pre survey, excluding questions on previous interprofessional experiences and focusing questions on the IPE activity students had engaged in over the previous 8 days. The survey was a time efficient tool for students at the completion of their final academic semester and provided greater access to participation when compared to the availability required for focus groups or individual interviews.

A few days before the IPE activity started, students were sent the pre survey, which included questions with free-text response options asking whether they had taken part in previous IPE activities (the majority said they had, 21 out of 26 in 2020 and 19 out of 24 in 2021) and about their experiences of interprofessional interactions in clinical workplace placements and previous IPE activities.

Eight days later, at the end of the IPE activity, students were sent the post survey, which included questions with free-text response options asking about their experiences of interactions in the small interprofessional learning teams in the cancer and life-limiting illness IPE only (see Appendix for the qualitative questions).

Due to the small numbers of students who participated from some disciplines, participant confidentiality was ensured by allocating a randomly assigned number as an identifier based on year of IPE. Participant responses in the 2020 survey as a collective of pre and post responses were identified as 1–31. In the 2021 survey, they were identified as 1–29.

Analysis

We used a 3-step analysis adapted from the process described by Attride-Stirling (2001). In the first level of analysis, akin to a content analysis phase (Krippendorff, 2018), we initially analysed the 2020 and 2021 years separately to see if there were differences that could be attributed to a particular cohort. To do this, we coded the full set of 2020 free-text responses, including all the *before-IPE* responses from the 20 out of 26 responding students (77%) and all the *after-IPE* responses from 11 out of 26 responding students (42%). Then we categorised the full set of 2021 free-text responses, including the *before-IPE* responses from the 18 out of 24 responding students (75%) and the *after-IPE* responses from 11 out of 24 responding students (45%). From this analysis, we concluded there were no major differences in the responses between the two cohorts. Next, we analysed the data as a complete set and coded them according to whether they were examples of effective or ineffective teamwork (clinical workplace or IPE) and then within the two sets of examples (effective and ineffective) by similarity and difference. We also coded these examples of effective or ineffective teamwork for expression of emotion (Talarico et al., 2004).

Figure 1

Health Professional Students' Responses to Effective and Ineffective Teamwork
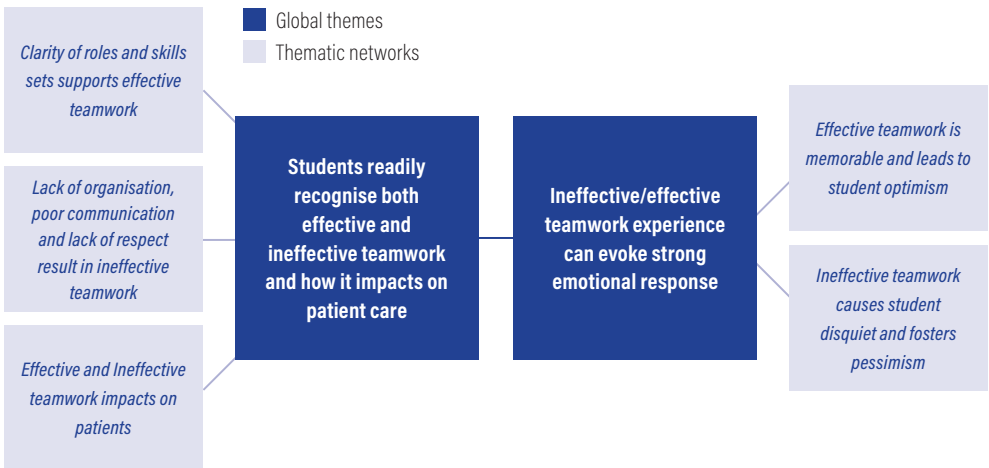
In a second level of analysis, we looked for commonalities and differences between the *before-IPE* and *after-IPE* free-text responses (in clinical workplace and IPE) and created thematic networks. It was not possible to match the *before-IPE* and *after-IPE* responses

of individual students because some used different devices to access the Qualtrics™ link and they could not be matched. However, when analysing the data for possible contrasting responses between the *before-IPE* and *after-IPE*, commonality was more evident than difference.

Finally, in a third level analysis from the thematic networks, we determined if there were global themes across all categories of free-text responses (see Figure 1).

Results

The first level of analysis from coding both cohorts *before-IPE* and *after-IPE* questions resulted in the organisation of text segments. Students experienced or observed a range of interactions within interprofessional teams in the clinical workplace and in IPE learning teams and recognised these team interactions as being effective or ineffective. There were a range of emotional responses to students' perceptions of effective or ineffective teamwork.

When referring to effective teamwork, the words and phrases used were: "good" (the most frequently used word), "positive", "valued member of the team", "can confide in members of the team", "friendly", "trusted", "respected", "well-supported", "safe", "comfortable", "confident", "at ease". Qualifiers or words used to enhance another word's meaning (such as "very", "a little") were rarely used when describing effective teamwork. In contrast, when referring to examples of ineffective teamwork, a much wider range of descriptors were used. Words such as "frustrated" (the most frequently used word), "annoyed", "uncomfortable", "unappreciated", "not important", "embarrassed", "guilty", "undervalued", "excluded", "burdensome", "unwanted", "sad", "upset", disrespected", incompetent", "unimportant", "nervous" and "angry" occurred and recurred. In addition, qualifiers were often added ("extremely", "very"), and in several instances, cumulative adjectives (more than one emotive word, such as very, very) were used for further emphasis.

In the second level of analysis, after careful consideration and in line with qualitative research principles, we concluded that analysis across all free-text responses was most appropriate and thematic networks were developed. Descriptions of actual examples and emotional responses were discrete and specific to each responder and each context, but the recognition of, and thoughtful reflection on, effective and ineffective teamwork applied regardless of whether in the observed clinical workplace or in the students' own learning environment.

In the third level of analysis, we identified two global themes encapsulating the thematic associations and organised them as central concepts. These were: (1) students readily recognise both effective and ineffective teamwork and how it impacts on patient care and (2) ineffective teamwork experience can evoke strong emotional response. Figure 1 is a representation of the thematic networks and global themes.

For both themes, examples are given from students' experiences of teamwork in the clinical workplace and in IPE.

Global Theme 1: Students readily recognise both effective and ineffective teamwork and how it impacts on patient care

Despite having different combinations of disciplines in the two cohorts, the responses were consistent in relation to effective and ineffective teamwork in both their clinical workplace experience and within their small IPE teams.

Subtheme: Clarity of roles and skill sets supports effective teamwork

Students differentiated roles and skill sets and, in these workplace examples, identified who was appropriate to take the lead in different situations, often mentioning the disciplines involved, which showed they understood the difference between disciplines and skill sets:

> *Everyone talked in the morning and made a time to be free to see this patient … everyone knowing their role and working together. If [it] was to stand patient up, everyone was there, but the physiotherapist was the leader. When weighing the patient, the manual handling expert [was] the leader, and when washing/cleaning, the nurses took the lead.* (2020, Response 2)

They recognised when a workplace team valued a range of disciplinary skill sets. Students noted respectful, open interprofessional communication was used to foster effective teamwork, particularly careful listening and mutual understanding:

> *We would discuss the patient from each member of the team's perspective and comment on their progress and where they should go on discharge. Everyone listened to each other, and everyone's opinion was valid.* (2020, Response 10)

Similarly, in their own recent IPE learning team, students noticed the attributes of other disciplines and how these could be best utilised for team learning:

> *I noticed it when we put together our person-centred snapshot [a PPT slide in a student presentation]. The different disciplines noticed different things about our patient as a person. Medical students were aware of how the course of treatment was, nurses aware of how good the care was, social work were aware of how the patient was interacting with whānau, and so on.* (2021, Response 22)

Students noticed that being flexible and adaptable and covering for each other was very important for effective IPE teamwork:

> *Before the interview started, one of the team members that was supposed to be asking questions couldn't get her microphone to work, so she took notes while another team member asked questions in her place.* (2021, Response 28)

Subtheme: Lack of organisation, poor communication and lack of respect result in ineffective teamwork

Conversely, students recognised where ineffective clinical workplace teamwork and, sometimes, omissions of actions resulted in compromised care, delays and general workplace frustration. These students described poor organisational workflow, which had adverse flow-on effects for everyone, but particularly for patients:

> *Knowing that the team required input from physio but not organising for this to take place until the day of discharge, and then them not clearing the patient for discharge [meant] the team being annoyed the patient couldn't go home.* (2020, Response 3)

Others observed poor relationships or communication between disciplinary groups, with some interpreting why this might be so:

> *Sometimes [there were] rocky relations between nursing and medical staff ... often down to egos, stereotypes, discounting experience or just not understanding each other's jobs and their goals. (*2020, Response 19)

In their own recent IPE learning teams, some students commented on unsatisfactory team behaviour, which they recognised mirrored the disciplinary differences and tensions they had observed in clinical workplace practice:

> *We were [the] only two members [who] constructed/built the [PPT] presentation, but the others got the glory of talking/presenting slides. … This makes you feel like you … don't deserve recognition for your contribution. It came down to the hierarchy of the profession, even though there should not be one.* (2020, Response 21)

Other students blamed themselves:

> *At the beginning, when discussing a case study, no one knew each other, so we were shy to speak up and interact at times. I felt uncomfortable sharing opinions with the group, at times, because I didn't want to be judged or seen as wrong—as I didn't know how they would perceive my contributions.* (2021, Response 29)

Subtheme: Effective and ineffective teamwork impacts on patients

Students readily linked the effective teamwork they observed in clinical practice with improved patient outcomes, optimised patient experience and team satisfaction:

> *They were all aiming for the same goals: getting the [patient's plaster] casts put on under a general anaesthetic and also organising how the [patient] would get around with their casts. This goal was achieved, and the team all felt they fulfilled their part in the patient journey.* (2021, Response 7)

This student noted the importance of a shared interprofessional forum to contribute information from different disciplinary perspectives and how information dovetailed to come to a shared decision about the interventions required:

> *Having someone there at the MDT [multidisciplinary team meeting] from the different professions and all voicing what was going on with the patient allowed for better care and interventions to be achieved.* (2020, Response 15)

In contrast, students recognised situations where patient care was directly adversely affected by ineffective team functioning, including communication being "dropped" between different disciplines. A student described the impact on a patient's health outcome of not engaging a critical team member:

> *Due to this [team member] not allowing dietitian input, he has put many patients' health in jeopardy. For example, giving a patient high-dose vitamin C post chemo interfering with the effectiveness of the chemo.* (2020, Response 18)

Students also recognised ineffective team functioning contributed to inappropriate care being given, with further adverse knock-on effects for individual patients as well as the system more widely:

> *The acute (mental health) care team would not collaborate with me and demanded that I continue working with the client I had referred on to them, despite me clearly outlining that we cannot hold the risk of people who are actively suicidal.* (2021, Response 16)

Global Theme 2: Ineffective/effective teamwork experience can evoke strong emotional response

Students not only used descriptive phrases but sometimes overtly emotive language when describing their teamwork experiences. Words describing intense feelings were particularly associated with poor experiences. This applied not only to comments made about previously observed workplace clinical practice but also to the just-completed experiences in an IPE learning team. Typically, students described effective teamwork in brief statements, such as, "It felt good to be part of collaborative practice" (2020, Response 20), whereas descriptions of ineffective teamwork were more expressive and emotive:

> *Lack of respect and utilisation of allied health expertise by the doctors. [It was] very unpleasant. … [I felt] embarrassed, angry, frustrated, disappointed.* (2020, Response 14)

Subtheme: Effective teamwork is memorable and leads to student optimism

Students readily recalled instances of effective teamwork in the clinical setting. When asked how to describe how this experience made them feel, they voiced the importance of having not only their own but also others' opinions heard and respected:

> *It is wonderful to see the team band together to assist the keyworker with their next steps. They are keeping the client at the centre of everything and genuinely want the best outcome for them.* (2021, Response 4)

Similarly, in relation to their recent IPE learning teams, students recognised when teamwork was effective, as it resulted in a comprehensive understanding of the patient, and this in itself was a reward to the learning team:

> *It was successful, as we each picked up unique findings and … [when] we collaborated … we uncovered a really full and well-established picture, centred around our patient's illness journey.* (2020, Response 30)

They also recognised the value to a team in forward planning, divvying up tasks, as well as knowing they would perform better collectively than individually:

> *When interviewing the patient, we talked about the way we were going to approach it beforehand, and this allowed for a smoother interview.* (2021, Response 29)

Subtheme: Ineffective teamwork causes student disquiet and fosters pessimism

When students observed or participated in what they perceived as ineffective teamwork in the clinical workplace, disquiet was clearly expressed, with strong, emotively negative language used and students often feeling personally responsible but unable to intercede:

> *I didn't feel as though my input was as valid or "heard", as people kept going back and forth on the little things that didn't necessarily matter.* (2020, Response 10)

One student described reluctantly "following orders", and a predicted adverse event, in fact, occurred. The student expressed guilt on behalf of colleagues. They recognised the harm that may have resulted when the appropriate expert advice of one health discipline was ignored or overridden by another:

> *We were not happy with taking the patient up the stairs with his hypotension. … We should have emphasised that it was unsafe, as the responsibility falls on us as the ones assessing the patient. And if the incident was more serious, not only may it have been a more severe outcome for the patient but also ourselves.* (2020, Response 7)

In the IPE learning situation, when asked about examples of ineffective teamwork, students noted several different aspects. They viewed students who did not "turn up" to IPE learning activities as being disrespectful to other students or seemingly entitled, in that they viewed their discipline as being more important than others and the IPE activity as being below them. Some students felt they were taken advantage of, or their work, or more generally the work of their discipline, went unrecognised or they felt stressed through lack of preparation. When recalling a past IPE activity, one student said it upset them, and they felt it also impacted poorly on the patient. Going forward, they did not want to take part in IPE learning activities:

> *I did not have a good/successful team. I was the person trying to communicate clearly, be open to ideas. The others in the team liked that I did all the work. The poor/unsuccessful teamwork was a nightmare to deal with. One student didn't turn up to team meetings*

or participate in the presentation. The other student … was rude and forceful, and the patient [being interviewed] became unreceptive and unhappy. … [I felt] very unhappy, stressed and not wanting to participate in IPE again. (2021, Response 14)

Discussion

Two cohorts of students took part in an IPE activity and were asked to recall and describe previous experiences of and feelings about previous interprofessional clinical workplace and IPE activity interactions and experiences and feelings about a just-completed IPE activity. Students gave excellent examples of a wide range of teamwork interactions experienced in the clinical workplace and during IPE activities, ranging from outstanding to unsatisfactory. The examples given were often rich in description, with evidence of considerable and thoughtful synthesis, not only about examples of clinical workplace teamwork or IPE teamwork but also how this affected patient care.

Student observations of workplace teamwork have been reported in other studies (Bianchi et al., 2019; Fitzsimmons et al., 2017; Morphet et al., 2014; Pinto et al., 2012; Robson & Kitchen, 2007), although in general, published studies seem to favour reporting effective or mainly effective interprofessional teamwork or collaboration (Fitzsimmons et al., 2017; Morphet et al., 2014; Pinto et al., 2012). In studies that include examples of ineffective teamwork, problems were attributed to communication difficulties, poor organisation and planning, relationship problems (Robson & Kitchen, 2007), goal or work culture differences (Bianchi et al., 2019) and persistent hierarchies (Derbyshire & Machin, 2021). This study adds to the literature, as it reports students' views on aspects of poor teamwork not only in workplace settings but also in IPE learning teams, including IPE activities that are long established and have undergone close monitoring. Students described unprofessional teamwork behaviour, such as clinical or learning work being made invisible, others claiming clinical or learning work as their own, and in the workplace setting, being professionally compromised by being made to do something they did not agree with, resulting in the patient being harmed.

This study shows that health professional students can experience intense emotional responses when observing or participating in clinical workplace teamwork and in interprofessional learning activities. Like the medical students who participated in other studies where negative experience happened (Dornan et al., 2015; McNaughton, 2013; Weurlander et al., 2019), the health professional students in this study reported being particularly affected by negative interactive experiences, including in IPE learning activities. These less satisfactory experiences evoked much more strongly and descriptively worded negative emotions than those perceived as effective. In some instances, IPE team difficulties were overtly identified as analogous to ineffective clinical practice teamwork behaviours.

Typically, emotive language spans a continuum within the concepts of valence, intensity and activation (Ingleton, 1999; Talarico et al., 2004). While research has been

undertaken on students' emotional responses or moral distress in response to what they see in the workplace or experience in learning in relation to their particular discipline (Arieli, 2013; Monrouxe et al., 2015; Monrouxe et al., 2014; Ong et al., 2022; van Vuuren et al., 2018), limited work has been undertaken to examine the impact of emotion on students' interprofessional learning when it is focused on interprofessional teamwork or collaborative practice (Dadich & Olson, 2017; Olson & Dadich, 2019).

In this study, a continuum of emotive language was clearly evident in students' descriptions about IPE activities and interprofessional teamwork in clinical workplaces. Notably, the words associated with effective experiences of interprofessional teamwork were limited in variety and not given additional qualifiers. They had more neutral valence and tended towards deactivation. In other words, it was as if students were not surprised by effective teamwork: it was *good* and *expected*. In contrast, the number of emotions used to describe ineffective teamwork examples were far greater, had an overtly negative valence and were more intense and more activating. Similar to Bianchi et al.'s (2019) study, ineffective interprofessional teamwork was very frequently described as "frustrating" or "very frustrating".

Negative emotions result in greater levels of arousal, prompting active recall and more vivid memories of the interaction (Talarico et al., 2004). Some of the episodes of clinical workplace teamwork described had occurred sometime previously (these being final-year students). Some had likely been experienced within their own discipline's training placement (with interprofessional teamwork not being the focus) rather than an IPE placement, and therefore, it seems unlikely that students would have been given an opportunity to debrief on the teamwork experience. It is possible the frustration resulting from some students' experiences of ineffective interprofessional teamwork in the workplace may result in them becoming cynical about teamwork in general (the impact of the hidden curriculum) and/or being reluctant to take part in future IPE.

Ajjawi et al. (2021) advocate studying emotion in relation to education. They say negative emotion is inevitable and should not be avoided. If addressed using a social–cultural framework, it can be motivating rather than paralysing (Ajjawi et al., 2021). This is in contrast to Mohr et al.'s (2021) study, which concluded that if positive emotion is experienced in IPE, it may assist students to apply their knowledge and see the benefits of collaboration (Mohr et al., 2021). Olson & Dadich's (2019) work has found emotions and emotion work are expressed differently between disciplines (Olson & Dadich, 2019), and they have also found the expression, or acknowledgement of, emotion is important to recognise when examining the nature of interprofessional teamwork (Dadich & Olson, 2017).

Within a learning environment, it is possible the undesirable impacts of intense negative emotion experienced when viewing or being part of poor teamwork interactions can be, as Mohr et al. (2021) suggests, mediated through reflection if students are specifically asked to recall this aspect, even if some time after the event (Mohr et al., 2021). Traditionally,

when asked to reflect, students are not usually directed to recall how they emotionally felt about an experience, rather they are usually directed to report, respond, reason, relate and reconstruct (Bain et al., 2002). This is often followed by a teacher-led debrief (Uygur et al., 2019). Reflection is advocated as an interprofessional competency or capability (Canadian Interprofessional Health Collaborative, 2010) and ideally incrementally developed, starting individually, then in learning groups (Clark, 2006; Zarezadeh et al., 2009), preferably in a written form, which supports students to make sense of experience (Moon, 2004), and ideally followed by a debriefing process either individually or collectively (Nyström et al., 2016). In this study, the survey questions coupled with the brief hidden curriculum teaching intervention (Evans et al., 2012; Peterson et al., 2018) acted as tools for reflection and offered students the opportunity to closely examine what they had seen of teamwork in past practice and to also report their emotional responses.

Strengths, limitations and suggestions for future research

This study included health professional students from a range of health disciplines participating in one IPE activity in one workplace site. Most said they had taken part in previous IPE learning activities, although we were not able to judge if they met the criteria for being IPE (CAIPE, 2017). In each cohort, there were different combinations of health discipline students, although the experiences reported were similar. In both years, the survey response rates to the *before IPE* were acceptable (77% and 75%), however the rates were lower for the *after-IPE* surveys (42% and 45%). Several phases of analysis of the free-text comments resulted in the identification of global themes.

Further research is needed to explore the impact of emotion on students' interprofessional learning when it is focused on interprofessional teamwork or collaborative practice, what constitutes poor learning and care environments and why these are occurring. In particular, research is needed to explore the impact of negative student learning experiences on interprofessionalism and, more importantly, how students' clinical experiences, both negative and positive, can be leveraged to create meaningful interprofessional learning environments.

Conclusion

Final-year health professional students from allied health, medicine and nursing are well able to recognise, describe, judge and reflect on effective and ineffective interprofessional teamwork in both workplace settings and IPE learning activities. Observation of, or participation in, ineffective teamwork consistently caused strong negative emotions and, therefore, has the potential to impact on future teamwork participation and experiences. IPE activity facilitators are advised to be aware of this. This study suggests it may be beneficial to routinely ask students in IPE to reflect on previous effective and ineffective teamwork experiences both in the workplace or/and in IPE, including being given the opportunity to express their emotional response to these examples and then to engage in an active debrief process. Developing the ability

to individually and collectively reflect on previous effective and ineffective teamwork experiences in IPE learning teams may be an important step to effective, sustained participation in future interprofessional clinical teams.

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References

Aase, I., Sæthre Hansen, B., & Aase, K. (2014). Norwegian nursing and medical students' perception of interprofessional teamwork: A qualitative study. *BMC Medical Education*, *14*, Article 170. https://doi.org/10.1186/1472-6920-14-170

Ajjawi, R., Olson, R. E., & McNaughton, N. (2021). Emotion as reflexive practice: A new discourse for feedback practice and research. *Medical Education*, *56*(5),480–488. https://doi.org/10.1111/medu.14700

Arieli, D. (2013). Emotional work and diversity in clinical placements of nursing students. *Journal of Nursing Scholarship*, *45*(2), 192–201. https://doi.org/10.1111/jnu.12020

Artino, A. R., Jr., & Naismith, L. M. (2015). "But how do you really feel?" Measuring emotions in medical education research. *Medical Education*, *49*(2), 140–142. https://doi.org/10.1111/medu.12642

Attride-Stirling, J. (2001). Thematic networks: An analytic tool for qualitative research. *Qualitative Research*, *1*(3), 385–405. https://doi.org/10.1177/146879410100100307

Bain, J. D., Mills, C., Ballantyne, R., & Packer, J. (2002). Developing reflection on practice through journal writing: Impacts of variations in the focus and level of feedback. *Teachers and Teaching*, *8*(2), 171–196. https://doi.org/10.1080/13540600220127368

Bianchi, M., Bagnasco, A., Ghirotto, L., Aleo, G., Catania, G., Zanini, M., Carnevale, F., & Sasso, L. (2019). The point of view of undergraduate health students on interprofessional collaboration: A thematic analysis. *SAGE Open Nursing*, *5*. https://doi.org/10.1177/2377960819835735

Canadian Interprofessional Health Collaborative. (2010). *National interprofessional competency framework*. http://ipcontherun.ca/wp-content/uploads/2014/06/National-Framework.pdf

Centre for the Advancement of Interprofessional Education (CAIPE). (2017). *About CAIPE*. Retrieved May 10, 2023, from https://www.caipe.org/about-us

Clark, P. G. (2006). What would a theory of interprofessional education look like? Some suggestions for developing a theoretical framework for teamwork training. *Journal of Interprofessional Care*, *20*(6), 577–589. https://doi.org/10.1080/13561820600916717

Dadich, A., & Olson, R. E. (2017). How and why emotions matter in interprofessional healthcare. *International Journal of Work Organisation and Emotion*, *8*(1), 59–79. https://doi.org/10.1504/IJWOE.2017.083799

Derbyshire, J. A., & Machin, A. (2021). The influence of culture, structure, and human agency on interprofessional learning in a neurosurgical practice learning setting: A case study. *Journal of Interprofessional Care*, *35*(3), 352–360. https://doi.org/10.1080/13561820.2020.1760802

Dornan, T., Pearson, E., Carson, P., Helmich, E., & Bundy, C. (2015). Emotions and identity in the figured world of becoming a doctor. *Medical Education*, *49*(2), 174–185. https://doi.org/10.1111/medu.12587

Evans, J., Henderson, A., & Johnson, N. (2012). Interprofessional learning enhances knowledge of roles but is less able to shift attitudes: A case study from dental education. *European Journal of Dental Education*, *16*(4), 239–245. https://doi.org/10.1111/j.1600-0579.2012.00749.x

Fitzsimmons, A., Topp, K. S., & O'Brien, B. C. (2017). Investigation into physical therapist students' interprofessional experiences during an 8-week clinical clerkship: A qualitative study. *Journal of Physical Therapy Education*, *31*(2), 44–53. https://doi.org/10.1097/00001416-201731020-00006

Giroux, H. A., & Penna, A. N. (1979). Social education in the classroom: The dynamics of the hidden curriculum. *Theory & Research in Social Education*, *7*(1), 21–42. https://doi.org/10.1080/00933104.1979.10506048

Ingleton, C. (1999). *Emotion in learning: A neglected dynamic*. HERDSA Annual International Conference, Melbourne, July 12–15, 1999.

Institute of Medicine. (2015). *Measuring the impact of interprofessional education on collaborative practice and patient outcomes*. https://www.nap.edu/catalog/21726/measuring-the-impact-of-interprofessional-education-on-collaborative-practice-and-patient-outcomes

Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (4th ed.). Sage Publications. https://doi.org/10.4135/9781071878781

LeBlanc, V. R., McConnell, M. M., & Monteiro, S. D. (2015). Predictable chaos: A review of the effects of emotions on attention, memory and decision making. *Advances in Health Sciences Education*, *20*(1), 265–282. https://doi.org/10.1007/s10459-014-9516-6

Leedham-Green, K. E., Knight, A., & Iedema, R. (2019). Intra- and interprofessional practices through fresh eyes: A qualitative analysis of medical students' early workplace experiences. *BMC Medical Education*, *19*, Article 287. https://doi.org/10.1186/s12909-019-1722-8

McCloughen, A., Levy, D., Johnson, A., Nguyen, H., & McKenzie, H. (2020). Nursing students' socialisation to emotion management during early clinical placement experiences: A qualitative study. *Journal of Clinical Nursing*, *29*(13–14), 2508–2520. https://doi.org/10.1111/jocn.15270

McKinlay, E., White, K., Garrett, S., Gladman, T., & Pullon, S. (2023). Work-place cancer and palliative care interprofessional education: Experiences of students and staff. *Journal of Interprofessional Care*, *37*(1), 29–38. https://doi.org/10.1080/13561820.2021.1981259

McKinlay, E., White, K., McChesney, P., Hardie, C., Higgs, R., Hilder, J., & Gallagher, P. (2019). Interprofessional education for cancer care. *The Clinical Teacher*, *16*(5), 519–524. https://doi.org/10.1111/tct.12985

McNaughton, N. (2013). Discourse(s) of emotion within medical education: The ever-present absence. *Medical Education*, *47*(1), 71–79. https://doi.org/10.1111/j.1365-2923.2012.04329.x

Mills, L. (2022). Expanding the discourse on emotion across health professions education. *Medical Education*, *56*(5), 470–472. https://doi.org/10.1111/medu.14746

Mohr, S., Grahn, H., Krohne, C., Brätz, J., & Guse, A. H. (2021). Academic emotions during an interprofessional learning episode in a clinical context: Assessing within- and between-variation. *Journal of Interprofessional Care*, *35*(2), 248–256. https://doi.org/10.1080/13561820.2020.1721445

Monrouxe, L. V., Rees, C. E., Dennis, I., & Wells, S. E. (2015). Professionalism dilemmas, moral distress and the healthcare student: Insights from two online UK-wide questionnaire studies. *BMJ Open*, *5*(5), Article e007518. https://doi.org/10.1136/bmjopen-2014-007518

Monrouxe, L. V., Rees, C. E., Endacott, R., & Ternan, E. (2014). "Even now it makes me angry": Health care students' professionalism dilemma narratives. *Medical Education*, *48*(5), 502–517. https://doi.org/10.1111/medu.12377

Moon, J. (2004). *A handbook of reflective and experiential learning: Theory and practice*. RoutledgeFalmer. https://doi.org/10.4324/9780203416150

Morphet, J., Hood, K., Cant, R., Baulch, J., Gilbee, A., & Sandry, K. (2014). Teaching teamwork: An evaluation of an interprofessional training ward placement for health care students. *Advances in Medical Education and Practice*, *5*, 197–204. https://doi.org/10.2147/AMEP.S61189

Nyström, S., Dahlberg, J., Edelbring, S., Hult, H., & Dahlgren, M. A. (2016). Debriefing practices in interprofessional simulation with students: A sociomaterial perspective. *BMC Medical Education*, *16*, Article 148. https://doi.org/10.1186/s12909-016-0666-5

Olson, R. E., & Dadich, A. (2019). Power, (com)passion and trust in interprofessional healthcare. In R. Patulny, A. Bellocchi, R. Olsen, S. Khorana, J. McKenzie, & M. Peterie (Eds.), *Emotions in late modernity* (pp. 267–281). Routledge. https://doi.org/10.4324/9781351133319

Ong, R. S. R., Wong, R. S. M., Chee, R. C. H., Quek, C. W. N., Burla, N., Loh, C. Y. L., Wong, Y. A., Chok, A. K.-L., Teo, A. Y. T., & Panda, A. (2022). A systematic scoping review moral distress amongst medical students. *BMC Medical Education*, *22*, Article 466. https://doi.org/10.1186/s12909-022-03515-3

Peterson, D. T., Brown, M., Wingo, N., & Watts, P. (2018). Exploring hidden curricula in an interprofessional intensive care unit simulation. *Clinical Simulation in Nursing*, *22*, 22–25. https://doi.org/10.1016/j.ecns.2018.07.001

Pinto, A., Lee, S., Lombardo, S., Salama, M., Ellis, S., Kay, T., Davies, R., & Landry, M. D. (2012). The impact of structured inter-professional education on health care professional students' perceptions of collaboration in a clinical setting. *Physiotherapy Canada*, *64*(2), 145–156. https://doi.org/10.3138/ptc.2010-52

Pomare, C., Long, J. C., Churruca, K., Ellis, L. A., & Braithwaite, J. (2020). Interprofessional collaboration in hospitals: A critical, broad-based review of the literature. *Journal of Interprofesssional Care*, *34*(4), 509–519. https://doi.org/10.1080/13561820.2019.1702515

Reeves, S., Fletcher, S., Barr, H., Birch, I., Boet, S., Davies, N., McFadyen, A., Rivera, J., & Kitto, S. (2016). A BEME systematic review of the effects of interprofessional education: BEME Guide No. 39. *Medical Teacher*, *38*(7), 656–668. https://doi.org/10.3109/0142159X.2016.1173663

Robson, M., & Kitchen, S. (2007). Exploring physiotherapy students' experiences of interprofessional collaboration in the clinical setting: A critical incident study. *Journal of Interprofesssional Care*, *21*(1), 95–109. https://doi.org/10.1080/13561820601076560

Schmutz, J. B., Meier, L. L., & Manser, T. (2019). How effective is teamwork really? The relationship between teamwork and performance in healthcare teams: A systematic review and meta-analysis. *BMJ Open*, *9*(9), Article e028280. https://doi.org/10.1136/bmjopen-2018-028280

Schot, E., Tummers, L., & Noordegraaf, M. (2020). Working on working together: A systematic review on how healthcare professionals contribute to interprofessional collaboration. *Journal of Interprofessional Care*, *34*(3), 332–342. https://doi.org/10.1080/13561820.2019.1636007

Seaton, J., Jones, A., Johnston, C., & Francis, K. (2021). Allied health professionals' perceptions of interprofessional collaboration in primary health care: An integrative review. *Journal of Interprofessional Care*, *35*(2), 217–228. https://doi.org/10.1080/13561820.2020.1732311

Talarico, J. M., LaBar, K. S., & Rubin, D. C. (2004). Emotional intensity predicts autobiographical memory experience. *Memory & Cognition*, *32*(7), 1118–1132. https://doi.org/10.3758/BF03196886

Thomson, K., Outram, S., Gilligan, C., & Levett-Jones, T. (2015). Interprofessional experiences of recent healthcare graduates: A social psychology perspective on the barriers to effective communication, teamwork, and patient-centred care. *Journal of Interprofessional Care*, *29*(6), 634–640. https://doi.org/10.3109/13561820.2015.1040873

Tyng, C. M., Amin, H. U., Saad, M. N., & Malik, A. S. (2017). The influences of emotion on learning and memory. *Frontiers in Psychology*, *8*, Article 1454. https://doi.org/10.3389/fpsyg.2017.01454

Uygur, J., Stuart, E., De Paor, M., Wallace, E., Duffy, S., O'Shea, M., Smith, S., & Pawlikowska, T. (2019). A Best Evidence in Medical Education systematic review to determine the most effective teaching methods that develop reflection in medical students: BEME Guide No. 51. *Medical Teacher*, *41*(1), 3–16. https://doi.org/10.1080/0142159X.2018.1505037

van Vuuren, E. C. J., Bodenstein, K., & Nel, M. (2018). Stressors and coping strategies among physiotherapy students: Towards an integrated support structure. *Health SA Gesondheid*, *23*, Article 1091. https://doi.org/10.4102/hsag.v23i0.1091

Weurlander, M., Lönn, A., Seeberger, A., Hult, H., Thornberg, R., & Wernerson, A. (2019). Emotional challenges of medical students generate feelings of uncertainty. *Medical Education*, *53*(10), 1037–1048. https://doi.org/10.1111/medu.13934

Zarezadeh, Y., Pearson, P., & Dickinson, C. (2009). A model for using reflection to enhance interprofessional education. *International Journal of Education*, *1*(1). http://www.macrothink.org/journal/index.php/ije/article/view/191

Appendix

The Before-IPE and After-IPE Qualitative Survey Questions

Before-IPE

1. Thinking about the IPE learning activities you previously took part in, please, if possible, give an example of good/successful interprofessional student teamwork or collaboration.

2. How did the good/successful teamwork make you feel?

3. Thinking about the IPE learning activities you previously took part in, please, if possible, give an example of ineffective/unsuccessful interprofessional student teamwork or collaboration.

4. How did the poor/unsuccessful teamwork make you feel?

5. Thinking about your clinical workplace-based (hospital, community or other) clinical placements, please, if possible, give an example of good/successful interprofessional teamwork or collaboration.

6. How did the good/successful teamwork make you feel?

7. Thinking about your clinical workplace-based (hospital, community or other) clinical placements, please, if possible, give an example of poor/unsuccessful interprofessional teamwork or collaboration.

8. How did the poor/unsuccessful teamwork make you feel?

After-IPE

1. Thinking about the cancer and life-limiting illness IPE learning activity you have just completed, please, if possible, give an example of good/successful interprofessional student teamwork or collaboration.

2. How did the good/successful teamwork make you feel?

3. Thinking about the cancer and life-limiting illness IPE learning activity you have just completed, please, if possible, give an example of poor/unsuccessful interprofessional student teamwork or collaboration.

4. How did the poor/unsuccessful teamwork make you feel?