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Pre-licensure medical students' knowledge and views on interprofessional learning: A qualitative concept analysis based on real-world data

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Background: The several definitions of Interprofessional Education (IPE) allow for different interpretations and interchangeable terms. This study aims to determine the characteristics and attributes of the definition of IPE.

Materials and methods: In November 2019, 31 medical students (64.5% female) from a single institution took part in nine semi-structured interviews. We created a deductive three-level code system followed by an inductive code system based on several known IPE definitions. We extracted the main entities of the concept of IPE according to both code systems to create a framework. We used MaxQDA software for qualitative analysis. Verification of codes and categories was attained through sequential peer-debrief.

Results: Participants correctly named the WHO's definition of IPE, and outlined its four main dimensions according to the Interprofessional Education Collaborative report. We found new IPE attributes and demonstrated the weight of communication and role recognition. Two-thirds of medical students mentioned IPE activities that we classified as a contrary model (without collaboration or patient-centeredness) and a minimum weight was given to the importance of patient-centeredness.

Conclusion: Medical students' understanding of the concept of IPE is coherent. We deepened the understanding of previously identified definitions

of IPE, and we identified new attributes of the concept. Finally, we added "well-being" as a component of interprofessionality.

Introduction

Interprofessional Education (IPE) is fundamental to the excellent functioning of healthcare systems (Lapkin et al., 2013). It enhances attitudes toward collaboration and teamwork during medical formation, leading to improved attitudes toward interprofessionality upon graduation and better patient outcomes (Reeves et al., 2016). Its implementation in medical curricula is strongly recommended (Bandali et al., 2011).

Literature shows that medical students display very positive attitudes toward IPE (Ruebling et al., 2014; Chua et al., 2015; Luderer et al., 2017; Berger-Estilita et al., 2020a). Medical students in pre-clinical years have more positive attitudes, when compared to students in later stages of their training (Kozmenko et al., 2017; de Oliveira et al., 2018; Berger-Estilita et al., 2020a). Factors contributing to this decline in interprofessional attitudes include being more experienced in the healthcare field (McFadyen et al., 2010), previous IPE contact (Anderson and Thorpe, 2008), previous less positive experiences in IPE (Coster et al., 2008; Hudson et al., 2016; Visser et al., 2017) and having parents working in healthcare (Cooper et al., 2005).

The World Health Organization's Framework for Action in Interprofessional Education and Collaborative Practice (WHO, 2010) defines IPE as an activity of "students from two or more professions learn about, from, and with each other to enable effective collaboration and improve the quality of care." However, a closer look at the literature reveals several different interpretations and interchangeable terms (Olenick et al., 2010):

- According to the Centre for Advancement of Interprofessional Education (CAIPE, 2021), IPE involves "educators and learners from two or more health professions and their foundational disciplines, who jointly create and foster a collaborative learning environment."
- The Interprofessional Education for Collaborative Patient-Centred Practice (Wener et al., 2009) defines IPE as "learning together to promote collaboration" and further depicts three components in IPE: socialising healthcare professionals working together, developing mutual understanding and respect for various disciplines and imparting collaborative practice competencies.
- The Canadian Interprofessional Health Collaborative (CIHC, 2010) defines IPE as "occurring when students learn with, from and about one another" adding that IPE takes place when "healthcare professionals learn collaboratively within and across disciplines to acquire knowledge, skills and values needed for working in teams" (CIHC, 2010).

In 2009, six health professions from educational associations (osteopathic and allopathic medicine, nursing, pharmacy dentistry, and public health) in the United States created a collaborative to promote IPE learning interventions and established a document disclosing the core competencies for collaborative practice. This document, known as the Interprofessional Education Collaborative (IPEC) report (IPEC, 2011, 2016), aims to prepare the future healthcare workforce for enhanced team-based patient care. Over time, the IPEC report has gained worldwide acceptance as a core document to guide curriculum design within healthcare teaching.

The IPEC report sets four different dimensions of expert panel recommendations on interprofessional core competencies, which are aligned with the WHO statements: (1) ethics and values, (2) roles and responsibilities, (3) interprofessional communication, and (4) teamwork. This report provides a framework for high-quality, integrated patient care within each country's healthcare system.

Although the abovementioned definitions have overlapping terminologies and include aspects of interprofessionality, collaboration, shared values, and socialisation, an apparent uniformity of the definition of IPE is lacking, which might contribute to the misunderstanding of IPE. The correct understanding of the concept of IPE has implications for the adequate implementation of IPE activities in healthcare personnel formation curricula and may affect students' attitudes toward collaborative practice (Khalili et al., 2013). Therefore, the determination of a clear operational definition of IPE is the base for developing a more effective IPE design, delivery, and measurement.

This study aims to determine the characteristics and attributes of the definition of IPE and to distinguish between the defining and incorrect attributes of IPE in a medical student population. Moreover, we aim to develop a conceptual framework of IPE in a microcontext and determine the weight of each component of the IPE definition.

Materials and methods

Ethical considerations

The participants gave written informed consent to the interviews and the Bern Cantonal Ethics Committee (Req-2019-00743, 23.08.2019) waived the need for ethics approval. We used ID numbers to code students and requested no identifying data. All procedures from this investigation followed the Helsinki Declaration. This study was registered with the number ISRCTN41715934, first registration 12/12/2019.

Participants

The Medical Faculty of the University of Bern in Switzerland offers a 6-year curriculum of studying human medicine and features a 2-day optional rotation in interprofessional care. All medical students actively enrolled in the Faculty of Medicine of the University of Bern, Switzerland, during the academic year 2019/2020 were eligible for inclusion in the study (N = 2,089 students).

Study design

We performed a qualitative methodology approach to promote the comprehensiveness, understanding and validity of a proposed framework on the concept of IPE (**Figure 1**). Our framework was developed using the conceptual framework analysis technique from Miles et al. (2014). He defined a conceptual framework as "a visual or written product that explains, either graphically or in narrative form, the main objectives to be studied and the presumed relationships among them" (Miles et al., 2014). At the heart of this methodology lies an interpretative approach to social reality, offering understanding of the concept, instead of establishing causal relationships intended to provide outcomes.

This is a secondary qualitative analysis of a mixed-methods quantitative-qualitative design study based on a sequential explanatory model (Berger-Estilita et al., 2020a). Six hundred and eighty-three medical students from all 6 years of medical studies at the University of Bern, Switzerland replied to an online survey about attitudes toward interprofessional learning using a validated interprofessional attitudes scale (Pedersen et al., 2020). After completion of the online survey, students could tick a box signalling their availability to participate in semi-structured group interviews. Agreeing students were contacted to take part in nine semi-structured 1-h interviews, according to their availability. Thirty-one medical students took part, which focussed on their experience in interprofessional learning and the possible impact such learning might have on their own professional development. Students were asked about their characteristics (e.g., age, year of studies) and their understanding of IPE, according to a previously defined interview guide. The sessions were audio-recorded. HC transcribed it in intelligent verbatim format, and JB-E verified the transcripts' accuracy. The summaries of each interview were sent to all participants for content verification and approval (member-checking) (Morse, 2015). Further details of the methodology can be found elsewhere (Berger-Estilita et al., 2020a).

We used data from the semi-structured interviews to investigate medical students' perceptions of the definition of IPE. The interviewers (JB-E and HC) acted solely as facilitators, encouraging contributions from all participants and validating different views. The study was conducted in German. The analysis presented in this paper is an independent, *post-hoc* sub-study of the published group interview dataset (Berger-Estilita et al., 2020a).

Setting

All interviews took place at the Department of Anaesthesiology and Pain Therapy, Inselspital, Bern, Switzerland in November 2019.

Development of the interview guide

We used a known protocol (Castillo-Montoya, 2016) to develop a semi-structured interview guide (**Supplementary Data Sheet 1**). We first ensured that interview questions were aligned with our research questions; we then constructed an inquiry-based conversation; we asked for external feedback on interview protocols; and we piloted the interview guide amongst peers. The question route was developed to explore in-depth knowledge of the concept of IPE, its advantages and disadvantages, and the optimal time for introducing IPE in the medical curriculum.

Analysis

Development of the coding scheme for framework development

Before transcript analysis, HC and JB-E deductively created a basic category system based on the existing definitions
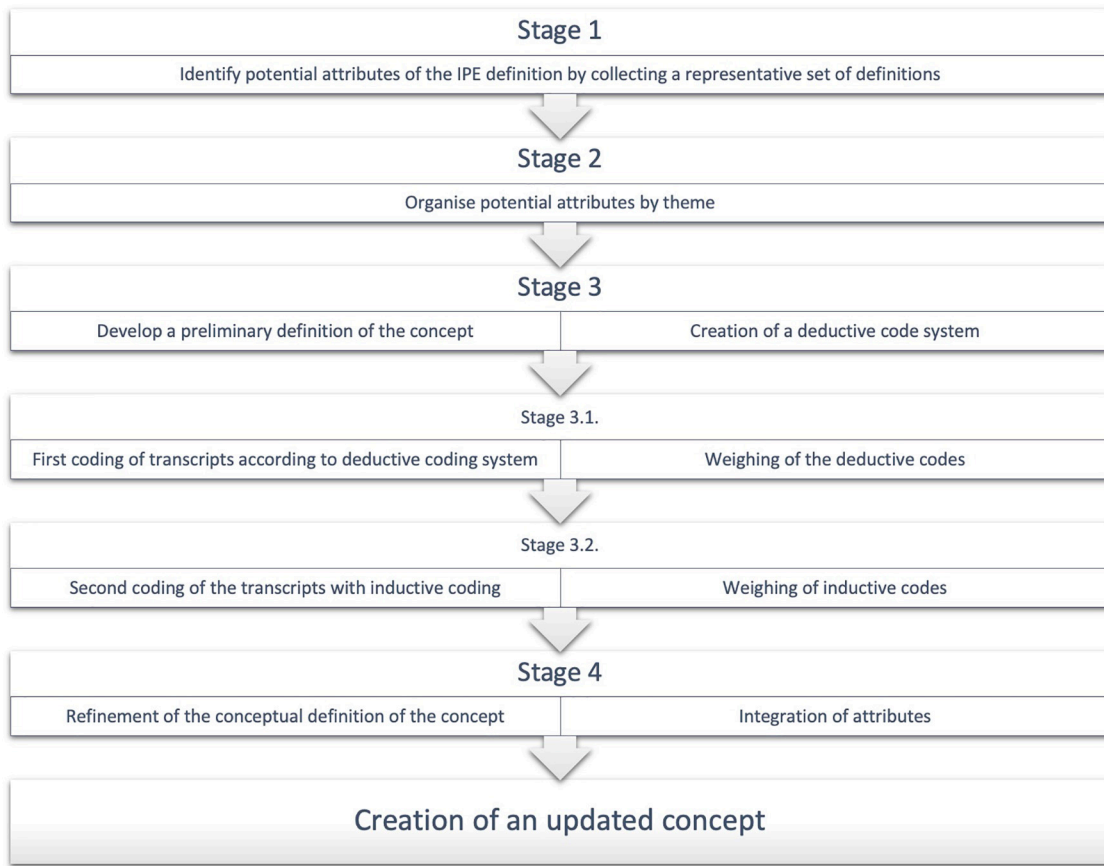
FIGURE 1
Study flowchart. Stepwise approach to the creation of an updated concept. IPE, interprofessional education.
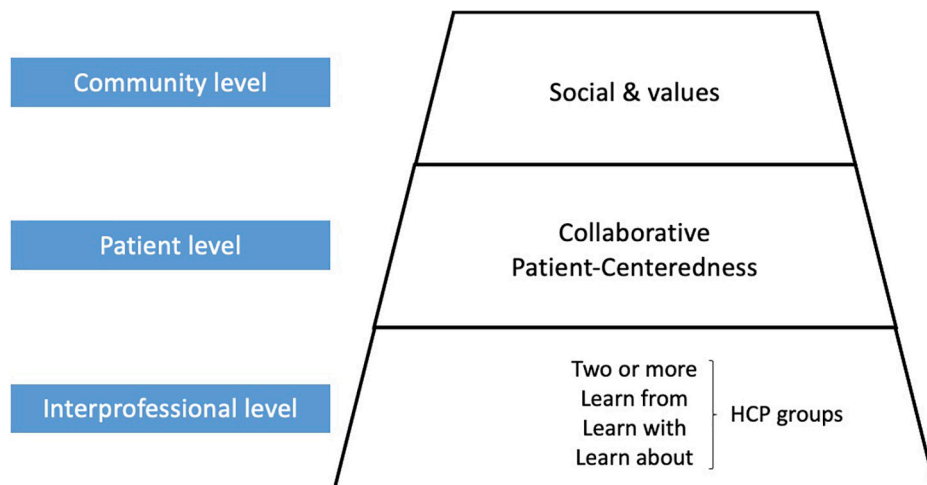

FIGURE 2
Three-level interprofessional education (IPE) framework. Deductively created three-level IPE framework, according to an increased concept complexity. HCP, healthcare professionals.

on IPE using the Podsakoff recommendations (Podsakoff et al., 2016). First, we identified all attributes from the abovementioned five representative definitions of IPE. Then, we organized those attributes by themes and sorted them in a hierarchy of increasingly complex attributes, where each attribute subsumes elements of the preceding lower level. Thus, conceptions in the category of attributes can include elements of the level below (Figure 2). We determined three levels, according to the increased complexity of the concept:

- Level One—"Interprofessional": attributes related to work with individuals of other professions.
- Level Two—"Teamwork": attributes related to knowledge of different roles, related to communication with patients, families and other health care professionals in a responsible manner, to attributes supporting a team approach and to building team dynamics, and related to patient-centred care.
- Level Three—"Societal": attributes related to working to maintain a climate of mutual respect, shared values/ethics and social interactions.

Finally, we developed a preliminary version of the concept and used this category system to code all nine interviews with the MaxQDA2020 version 18.2.0 software (Verbi, Berlin, Germany).

Two different researchers (HC, JB-E) independently coded the interviews. Difficulties and inaccuracies were noted and were discussed in consensus before deciding on the final coding system. Ambiguities and redundancies were discussed and eliminated by consensus or by consulting a third author (RG). We updated this deductively created coding system with the notes and memos generated during the transcription process (parallel memoing). This process was performed in a phased fashion. After coding three interviews independently, HC and JB-E verified agreement of the coding distribution and checked for saturation, before proceeding with the following three interviews.

The fourth stage of the Podsakoff et al. (2016) recommendations included a refinement of the conceptual definition by adding attributes explored by inductive coding. To comply with this step, JB-E, HC, and SM re-analysed transcripts using inductive thematic coding, which involved iteratively reading and rereading the data, grouping extracts into common themes and naming concepts. This coding ensured that the data generated were grounded in, or emergent from, the narratives of the interview participants. Data was processed according to the Miles et al. (2014) framework for conceptual data analysis. This included first data reduction—including segmenting, editing and summarising the data—followed by data display, and finally conclusion verification. We also

performed a qualitative "concept analysis" study according to Walker and Avant's methodology (Walker and Avant, 2005). We first determined a "standard" and "contrary" model of IPE according to Olenick et al.'s (2010) concept. We defined "standard" IPE activities as those describing groups of different professions' students participating in a learning activity where they collaborated in decision-making and developed plans of care, with a patient-centred focus. A "contrary" IPE activity would be any activity where, despite having participants from different professions, little or no evidence of collaboration or shared decision-making would be mentioned. We searched for examples of both models in the interviews. Additionally, we extracted code frequencies. During analysis, conceptual saturation was confirmed by the non-emergence of new codes or themes (Braun and Clarke, 2006). Relevant interview excerpts were selected to represent participants' perceptions relevant to the themes and explanations being constructed. We used a functionalist approach of creating equivalent translation structures (Resch and Enzenhofer, 2018) to translate direct quotations from the interviews into English. HC and SM (German-speaking) translated the citations from German to English with Google Translate. SeM (English-native speaker) performed changes to ensure that the reader could understand the target text.

Results

We interviewed students from all study years [Year 1: $n = 5$ (16%), Year 2: $n = 8$ (26%), Year 3: $n = 2$ (7%), Year 4: $n = 8$ (26%), Year 5: $n = 7$ (23%), Year 6: $n = 1$ (3%)]. There were 20 female students (64.5%). All 31 students mentioned previous interprofessional experiences (i.e., an IV cannulation workshop, a confidentiality seminar, nursing and clinical clerkships) during their studies, but only 6 (19%) took the optional 2-day rotation in interprofessional care.

Three main categories emerged from the semi-structured interviews: (1) attributes of IPE according to the three-level framework, (2) attributes of IPE according to the four dimensions of the IPEC report, (3) further attributes.

Attributes of interprofessional education according to the three-level framework

Students were aware of the intended meaning of IPE, as per WHO definition (2010). This description has been published elsewhere (Berger-Estilita et al., 2020a). The frequency and coverage of deductive codes according to the three-level framework is summarized in Table 1. Results stratified by year of studies can be found in Supplementary Table 1.

TABLE 1 Citation frequency.

Concept	Frequency (n = 386)
Interprofessional	161 (41.7)
Two or more	22 (13.7)
Learn from	28 (17.4)
Learn with	34 (21.1)
Learn about	77 (47.8)
Collaborative/Patient-centred	105 (27.2)
Collaborative	82 (78.1)
Patient-centred	23 (21.9)
Values/Social	120 (31.1)
Values	78 (65.0)
Social	42 (35.0)

Values are n (%).

Attributes of interprofessional education according to the four dimensions of the interprofessional education collaborative report

After being questioned, students could spontaneously give attributes of IPE concerning the four core competencies of the IPEC (2011) report.

Views on values/ethics for interprofessional practice

Participants underlined that IPE promoted mutual understanding and shared mental models, facilitating future interprofessional relationships. IPE is able to break down barriers and reduce prejudices. When learning together, participants accept that other healthcare professionals perform some skills better, and this fosters mutual respect and trust. Students mentioned that IPE enhances patient-centred care: by leading to greater work efficiency and potentiating a more positive working environment, patients may feel that healthcare professionals listen more attentively and have a more accurate overview of their problems.

Views on roles and responsibilities

Students mentioned that IPE improves the extent of knowledge of other healthcare students' roles, skills and abilities, and optimises cooperation while reducing misunderstandings. IPE makes one have a different perspective and be sensitive to how other healthcare professionals judge a situation. This clarifies the practical relevance of their work.

> (…) one understands better what the different professional groups know and can do, which leads to fewer misunderstandings in everyday hospital life (Student 4, Interview 6).

Views on interprofessional communication

Interprofessional education benefits communication between healthcare students regardless of the course content. Communication promotes shared mental models, and can facilitate future interprofessional relationships and a smoother settling into clinical practice. Good communication benefits collaboration and leads to better patient care. It also embodies a patient-centred approach, with multi-way communication between the patient, nurse and doctor. All this increases satisfaction in the workplace.

> The tendency is that you gain more communicative skills and have a more respectful attitude [towards others] (Student 1, Interview 1).

Views on teams and teamwork

Being conscious of what the other healthcare professions students learn leads to better cooperation and improves teamwork. IPE-experienced physicians will have a broader knowledge of available possibilities and delegate when appropriate, showing better attitudes toward collaboration. IPE reduces the effort to make teamwork efficient (facilitating interaction in hand-overs or rounds). This leads to easier integration in the workplace, enhances in-hospital social connections, and increases employee satisfaction.

> [IPE leads to] efficiency. If you feel comfortable, the patients do too. It is also good that they see that working together works. Nothing is worse than everyone arguing around you (Student 4, Interview 3).

Other views

Interprofessional education can mimic a natural work environment, and students will learn clinically-relevant participants and problem-solving, making learning more motivating and purposeful. IPE also teaches how to behave in a professional context.

Cultivating interprofessionality leads to more organised and efficient teamwork and a better working atmosphere. This improves patient safety (teams make fewer mistakes) and employee well-being. More satisfied employees are less inclined to leave for other institutions. Students noted that this combination of a more stable workforce and increased productivity would lead to financial benefits (Table 2).

> If nurses, doctors, physiotherapists and others involved in patient management (including secretaries) can work well together, there is a good working atmosphere. Therefore, people stay in the hospital. They are loyal to the employer (…). That saves money (Student 2, Interview 6).

TABLE 2 Subcategory other views elements and representative cites.

Subtheme with explanation	Representative cites (exemplary) from semi-structured interviews
Overarching goals of IPE • Learning together and gaining a more work-oriented perspective • Improvement of teamwork • Reduction of prejudices • Increase in patient-centeredness • Improvement of well-being in the workplace	Quote 1, Student 1, Interview 5: (...) you have the exchange between different professions very early [during medical school], so you do not come clueless to the hospital later. Quote 2, Student 2, Interview 1: You (...) become aware of the [roles of team members] and focus on working together. Quote 3, Student 3, Interview 6: If you have IP communication beforehand, future work with other healthcare groups will be simplified. Quote 4, Student 2, Interview 7: Not letting doctors feel superior to the nurses and correct the stereotype that "nurses only do what we do not want to because they are not good enough or the task is not challenging enough for us. Quote 5, Student 3, Interview 2: I think it is important to learn to appreciate what others do for the patient. We do not see the whole spectrum [of health care]. Especially the care or the physiotherapy or ergotherapy, too, contribute a lot - and we do not learn about that. Quote 6, Student 2, Interview 7: (...) you get to know people from other professions, and realise that these are people like you and me, they also have the same hobbies or like to go out on the weekend, and then you just notice that there is a different relationship, then you win something.

TABLE 3 Citation frequency and text coverage of further attributes.

	Frequency (*n*)	Percentage (%)
Communication	45	24.73
Role Recognition	28	15.38
Preparation for practice	27	14.84
Equivalence	15	8.24
Points of contact	13	7.14
Practical	13	7.14
A different point of view	13	7.14
Reduced mistakes	8	4.40
Efficiency	7	3.85
Organisation	4	2.20
Non-technical skills	2	1.10
Focus	2	1.10
Work climate	2	1.10
Role model	1	0.55
Attitudes	1	0.55
Acceptance	1	0.55
Total	182	100.00

Values are *n* (%).

Further attributes for the concept definition

We created 16 additional codes inductively, covering concepts not previously integrated into the definitions. Code frequency for the inductive codes is summarised in **Table 3**.

"Communication" was the most frequent inductive code, and students found it to have a central role in IPE. If health professionals are not forced to communicate, then they remain siloed. Communication between different health professionals is the starting point for exchanging ideas and coordinating teams. Many students argued that interprofessional learning should notably include communication skills. Students also related "communication" to higher attributes of IPE. They mentioned that improved communication between healthcare professionals

might lead to more satisfied team members, working with less friction, and reducing the time and energy spent on overcoming issues arising from lack of communication.

"Role recognition" was the second most frequent inductive code. Students valued the understanding of different healthcare professionals' competencies in interprofessional learning. Such role recognition facilitates task distribution by correctly assessing what each professional group can do and marks out the limits of each profession, suiting mutual expectations. Students mentioned that recognizing roles leads to the empowerment of each profession and enables better team performance and task completion.
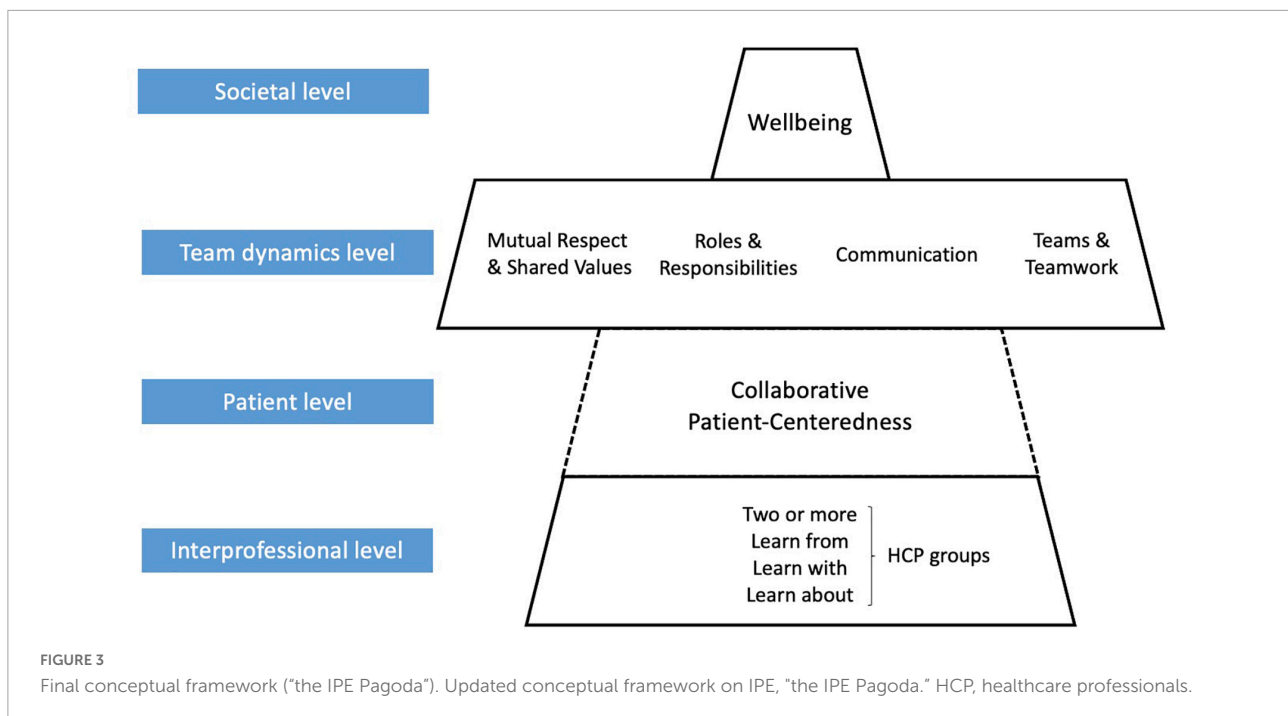
We also frequently coded segments with "Preparation for practice." Interprofessional learning seems more relevant for medical students in clinical settings, where role attribution is commonly applied. "Preparation for practice" was meant to promote early sensitisation to teamwork and facilitate future workplace interactions and skills, smoothing the transition into clinical practice. As higher interprofessional learning components, students mentioned the possibility of early networking, avoiding prejudices, and fostering horizontal leadership strategies.

Standard and contrary models

Students gave 96 examples of IPE activities. Thirty-two examples (33%) corresponded to IPE model cases (i.e., including patient-centeredness and collaboration) and 64 (67%) to contrary cases.

Conceptual framework ("the interprofessional education pagoda")

A conceptual framework for IPE definition derived from the above results is presented in **Figure 3**.

FIGURE 3
Final conceptual framework ("the IPE Pagoda"). Updated conceptual framework on IPE, "the IPE Pagoda." HCP, healthcare professionals.

We determined four levels, according to the increased complexity of the concept:

- Level One—Interprofessional: as previously.
- Level Two—Patient: attributes related to role attribution of different team players, a collaboration between other healthcare professionals with the patient at the centre of care.
- Level Three—Team dynamics: attributes related to optimal teamwork, improved communication, work ethics and respectful interaction between team members (Weller et al., 2014; Rosen et al., 2018).
- Level Four—Societal (broader education outcomes): attributes related to relationships with other professions outside the work environment to improve well-being, patient care and advance learning.
- The framework structure loosely resembles a Japanese temple; therefore, it was called the "IPE pagoda."

Discussion

This qualitative study demonstrates that medical students at a university that offers one interprofessional internship could identify all the concepts present in international definitions of IPE. However, we verified that students gave different weights to different attributes. Additionally, two-thirds of medical students mentioned a "contrary" model (without collaboration or patient-centeredness) as IPE activities. These results both support and build on recent definitions of IPE. The additional themes identified in this study expand on previous literature on this topic (Wener et al., 2009; WHO, 2010; IPEC, 2011, 2016; CAIPE, 2021). This is important because it demonstrates that IPE plays a more expansive role in pre-licensure students' medical education than previously thought (Hudson et al., 2016; Berger-Estilita et al., 2020b). Further, this is the first study in available IPE literature to confirm the four major principles of IPE as outlined by the IPEC report.

When asked, medical students could collectively name attributes of the IPEC dimensions and name other attributions outside the constructs above. We were positively surprised by these findings, as previous studies show that healthcare students may demonstrate professional socialisation (i.e., feeling and behaving like a member of that profession), which may lead to misconceptions and "tribalism" between professions (Beatie, 1995), leading to ineffective working and ultimately patient harm (Hawkes et al., 2013). We hypothesise that because medical students at Bern University have IPE in the first year of studies, they develop their professional identity parallel with other healthcare students. Such an early introduction of IPE may force medical students to contact and perceive other H as having the same basic knowledge, which will tackle lower levels of prejudice, permitting the development of better attitudes toward collaboration and mutual respect (Hawkes et al., 2013). Our findings corroborated this.

We were surprised to observe that "learning about" other HCP groups was more expressive than "learning from" or "learning with." The emphasis on "learning about" likely reflects a lack of knowledge about other healthcare professions. This

might be a consequence of the traditional "siloed" education of medical professions, which often leads to first exposure to IPE only in later stages of the training (Berger-Estilita et al., 2020a,b). Additionally, two-thirds of medical students mentioned a "contrary" model as IPE. While our sample stems from a medical programme with IPE already embedded in the curriculum, the current IPE offer might still be insufficient.

Patient-centeredness was mentioned in only one-fifth of the coded cites. Three core themes seem to emerge in different definitions of patient-centeredness (Hearn et al., 2019): patient participation and involvement, the relationship between the patient and the HCP, and the context in which health care is delivered. Patient-centredness is increasingly prioritised across medical schools and practice, but it is challenging to teach (Parent et al., 2016). Students expressed several concerns regarding this type of teaching, particularly knowing how to adequately present information to patients, being exposed to patients' enquiries or "pimping" (Cox et al., 2011). IPE might still be underrepresented in the medical curriculum of the University of Bern, as most teaching is "disease-centred," which reduces most probable awareness of the "patient-centred" style (Krupat et al., 1999). Our results suggest that medical students at the University of Bern have not yet fully evolved beyond the physician's role as expert HCP and collaborator into more differentiated Canadian Medical Education Directives for Specialists (CanMEDS) competencies as advocate and manager (Frank et al., 2015). We hypothesise that as medical students become more comfortable with their role as medical experts, they can glean different impressions from clinical encounters and develop their other intrinsic functions, as recommended in the Principal Relevant Objectives and Framework for Integrative Learning and Education in Switzerland (Michaud and Jucker-Kupper, 2017). Alternatively, it may be that in their clinical training, they are forced to address the roles of other HCPs and thus broaden their view of interprofessionality. This is in alignment with other studies, that if students are allowed to work as part of a team, they can develop a more precise insight into a patient-centred approach (Scavenius et al., 2006). While such issues will need to be addressed in further studies, it seems reasonable to recommend that if medical students show little awareness of patient-centeredness, they should be more exposed to interprofessional activities during their training (Krupat et al., 1999).

The social component of IPE was often mentioned. Students considered networking beneficial, both inside and outside the workplace. By engaging in interprofessional relationships, students learn about each other's curricula in informal settings and foster friendships. This aspect of IPE is not frequently explored in the literature. The social element repeatedly mentioned in the interviews mirrors the Social Learning Theory (Bandura, 1986). Learning is also a social and relational process, frequently occurring

around authentic and meaningful patient treatment (Friman et al., 2017). These findings support that "formal" or planned educational IPE experiences also create "informal" opportunities to socialise and be acquainted on a personal level. Therefore, these "informal arenas can stimulate and set a solid basis for interprofessional collaboration" (Reeves, 2000).

Finally, we propose to add "well-being" as a possible dimension of IPE. Well-being is "a dynamic state that refers to individuals' ability to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community" (Beddington et al., 2008). This definition is deeply related to the previous concepts of interprofessionality. Interprofessional studies show that negative interprofessional interactions between nurses and physicians increase the likelihood of nurse burnout and may be a critical factor in decreasing nurse well-being, increasing turnover, and worsening patient outcomes (Sinclair et al., 2015; Dow et al., 2019). However, well-being research on physicians and medical students is less established. Dow et al. (2019) argued that using an interprofessional approach may aid in identifying factors and establishing interventions to support the well-being of different professions better. These recommendations closely align with our findings.

Our findings underline several considerations that educators may include when considering interprofessional activities, particularly the importance of considering all levels of interprofessionality and having clear objectives for each level. Our interprofessional learning framework brings oversight to what appears to be a longitudinal process underscored by its use to improve patient outcomes, team dynamics between professionals, and individual and collective well-being. More attention must be paid to the learning environment of IPE activities to facilitate open, frank, and effective interactions.

Our study has limitations. There was a potential for selection bias as students were recruited voluntarily. In addition, the basic themes for the construction of this framework were provided only by medical students. The authors are aware that the reported findings may not represent other cohorts of medical students in Switzerland or elsewhere, as well as students from other healthcare professions. Therefore, great care must be taken in generalisations. We acknowledge that our findings might have been richer if we had also included clinicians, educators or students of other healthcare professions. This can be taken up in future studies.

Moreover, group interviews may also have introduced social desirability bias and the potential for recall bias. Finally, from the methodological perspective, we used a modified version of the original model-contrary case concept proposed by Olenick et al. (2010). By only using the model and the contrary cases, we might have used very high standards to classify medical students' experiences with IPE, leading to a high percentage of examples rated "contrary case."

Conclusion

The impact of this study is two-fold. Firstly, we deepened the understanding of previously identified definitions of IPE, and we identified new attributes of the definition. Secondly, by considering "well-being" as a component of interprofessionality, curriculum planners may offer more objective and authentic interprofessional experiences.

Data availability statement

The original contributions presented in this study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by the Bern Cantonal Ethics Committee (Req-2019-00743, 23.08.2019). The patients/participants provided their written informed consent to participate in this study.

Author contributions

JB-E and RG contributed to the study design. HC, SM, and JB-E performed the quality analysis. RG, AF, and SG critically reviewed the manuscript. All authors contributed to interpretation of the results and important intellectual content to the manuscript and approved the final version.

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Conflict of interest

JB-E was an associate editor for BMC Medical Education. RG was the Board Director of Guidelines and ILCOR of the European Resuscitation Council, the Task Force Chair Education, Implementation, and Team of ILCOR, and member of the direction of the MME Programme of the University of Bern. SG was also a member of the direction of the MME Programme of the University of Bern.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2022.978796/full#supplementary-material

SUPPLEMENTARY DATA SHEET 1
Interview guide.

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