

Review

# Undergraduate Interprofessional Education in the European Higher Education Area: A Systematic Review

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**Abstract:** Background: As a contribution to developing interprofessional education (IPE) synergy between medical education systems in the European Higher Education Area (EHEA), this review aims to describe the IPE experiences for undergraduate medical students implemented in EHEA member countries. Methods: This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The search was conducted on SCOPUS and MEDLINE databases. Inclusion criteria were peer-reviewed English language articles about undergraduate medical students, interprofessional education, and EHEA countries, published January 2000–September 2022. Results: The 32 included studies were from 14 of the 49 EHEA countries. In most of the studies, the theoretical background leading the intervention was not reported (n = 25), and in several studies (n = 16) the students were from two professions only. The reported outcomes were related to self-assessment knowledge about IPE and satisfaction about the program. In 24 studies, the assessment was based on the study's ad hoc measures only. Limitations ranged from selection bias to lack of objective measures. Conclusion: Future directions should envision developing IPE among EHEA countries, including agreement and consistency across EHEA countries in reporting theories, educational methods, and standardized IPE evaluation measures.

**Keywords:** EHEA; interprofessional education; medical students; undergraduate; soft skills

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## 1. Introduction

As defined by the World Health Organization (WHO) Framework for Action on Interprofessional Education and Collaborative Practice (2010), “Interprofessional education occurs when two or more professionals learn about, from and with each other to enable effective collaboration and improve health outcomes” [1]. Interprofessional collaboration has been identified as a key strategy to ensure patient-centered care; therefore, scholars advocate for providing medical students with interprofessional education (IPE) [2–5].

IPE is a relatively new approach, and several studies support the need of developing a consensus to delineate its further implementation and assessment [6–8]. In this direction, an agreement between several countries to harmonize their higher education systems would be a big advantage. As an example, the Bologna process has promoted the harmonization of different European higher education systems to build the European Higher Education Area (EHEA) grounded on the goals and values highlighted in the Sorbonne (1998) and Bologna (1999) Declarations [9–11]. The objective is to ensure academic freedom, institutional autonomy, academic quality, economic development, and social cohesion. To achieve this, governments have introduced a system of comparable degrees facilitated by a common credit system.

Currently, the EHEA includes 49 countries that have agreed to adapt their education systems to promote inclusive and accessible education, the comparability of the qualification systems through mutual recognition of study periods and qualifications, and

international mobility of students and staff. Though the implementation of the Bologna process needs further development [11–14], the EHEA provides a foundation of opportunities for the development of medical education internationalization and, potentially, the promotion of cross-border healthcare quality.

Interprofessional education is one of the areas in medical education in which EHEA member countries would benefit from a tuning of educational goals and cooperation to facilitate medical student mobility and their ability to face emerging trans-national health issues through interprofessional collaboration skills.

With the overarching aim of contributing to the development of synergy between medical education systems in the EHEA for IPE, this review specifically aims to describe and map the IPE experiences for undergraduate medical students that have been implemented in EHEA member countries. Knowledge of IPE experiences in EHEA countries is relevant, considering that IPE has been suggested to be a key pedagogical approach in healthcare education, as it equips students with awareness of each other's professions and the ability to collaborate with other professions in a safe learning environment before entering clinical settings and adopting the related responsibilities [15–18].

We focus on undergraduate medical education because IPE has been promoted as an important complement to the undergraduate-level curriculum, and it has been proposed to be delivered in the early stages of training e.g., [16].

Though the surge of interest in IPE in the EHEA countries is demonstrated by papers on validation of interprofessional attitude scales [19–21] and consensus statements across countries [22–24], a critical review describing the IPE programs offered by EHEA member universities for undergraduates has not been performed.

This review bridges this gap by addressing the following questions:

- What are the theoretical backgrounds of IPE interventions in EHEA?
- What are the disciplines included in the IPE interventions?
- What are the key outcomes of IPE experiences?
- What are the key limitations of IPE experiences?

The results are discussed, highlighting the key practical implications for the development of future IPE programs as well as potential research opportunities.

## 2. Materials and Methods

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [25–28].

An electronic search was conducted in two databases: Scopus and MEDLINE. The search included the period between the Bologna Declaration (1999) and September 14, 2022. The primary term searched in the “title/abstract” search field was “interprofessional”, with the names of the EHEA member countries being searched in the “affiliation” search field using Boolean combinations. A copy of the search keywords is presented in Appendix A.

Articles were scanned considering the following inclusion criteria: corresponding author and/or location of IPE intervention based in EHEA member country; peer-reviewed articles; written in English; undergraduate medical students included; description (duration and content); and evaluation of IPE intervention.

The exclusion criteria were as follows: review/opinion/consensus papers; graduate and postgraduate participants; lack of information about the IPE intervention; and lack of information about the medical students of or less than three medical students in the post-evaluation intervention.

All titles were independently screened by two reviewers (VC and IBV), prioritizing sensitivity over specificity. Thus, all potentially relevant titles were included. In a second step, the abstracts of all included papers were identified through a primary electronic search. To identify further relevant papers, we scrutinized the reference sections of the selected papers. Disagreements about the inclusion/exclusion process were resolved through discussion with additional reviewers (KY, YN).

The full-paper screening was conducted by two reviewers working independently (VC and IVB), while the coding was conducted by three reviewers (VC, KY, and YN).

Data extraction was performed using a data coding form comprising (1) authors/title of paper, (2) publication year, (3) country in which the IPE intervention was conducted, (4) theoretical basis of the intervention, (5) student population (number, gender, stage of training, education), (6) intervention (content, duration, number of students, gender, profession of the educators), (7) key outcomes, and (8) key limitations identified by the authors.

### 3. Results

The initial search yielded 588 papers, 28 of which were identified through reference searches. After removing duplicates, 567 papers remained for screening. Through title and abstract screening, we excluded 381 papers, leaving 186 papers. Through full-text screening, we excluded an additional 154 papers. A total of 32 papers satisfied the inclusion criteria and were included in the final review (Figure 1). The agreement between the two raters (i.e., the inter-rater reliability) was >90%.

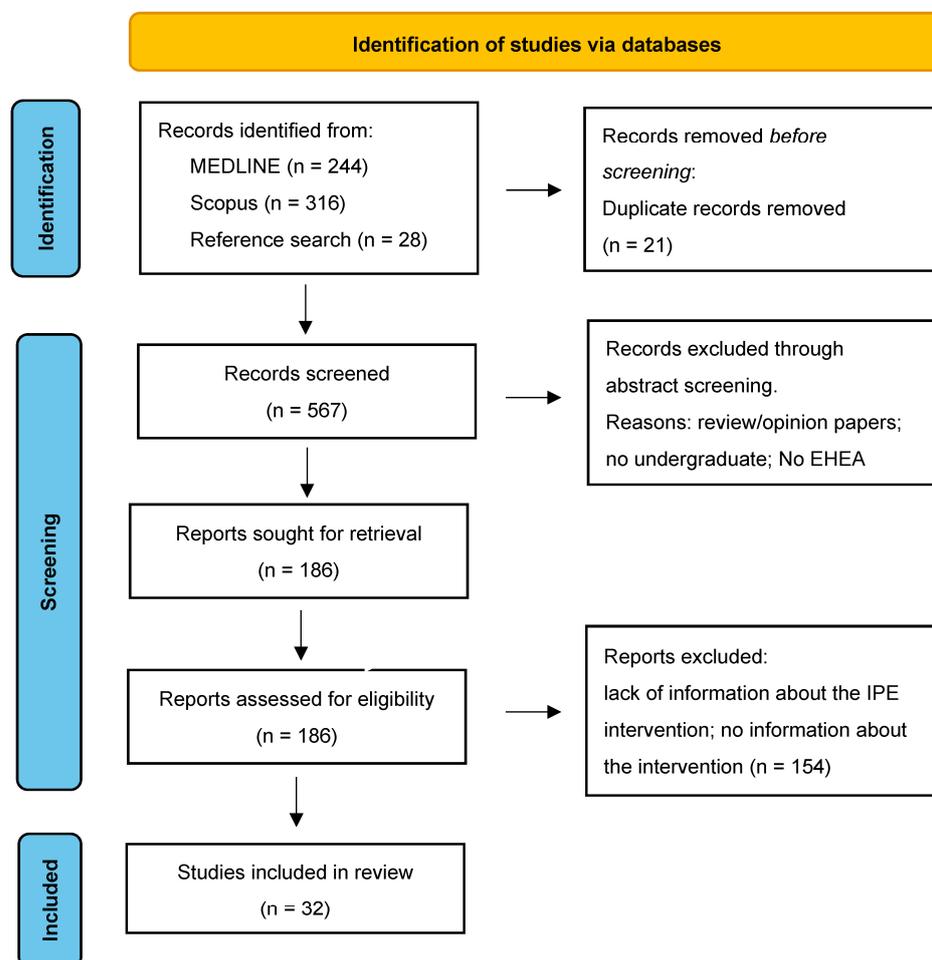


Figure 1. PRISMA flow diagram.

The papers reported the use of IPE interventions in 14 different EHEA member countries (Table 1), and the distribution was uneven among the countries, with most of the papers from Germany (n = 8) [29–36], the UK (n = 8) [37–44], and Sweden (n = 5) [45–50].

**Table 1.** IPE experiences in EHEA countries.

| Country | Target Population   | Key Outcome   | Key Limitation   | Reference |
|---------|---|---|--|-----------|
| Germany | Medicine; physiotherapy   | Increased students' attitudes and perceptions towards IPE in anatomy and understanding of professional roles and teamwork   | Selection bias   | [29]      |
|         | Medicine; nursing; allied healthcare  | Satisfaction with an interprofessional tutor qualification program  | No pre-post-survey; single site study; no control group; results are based on self-assessments; no study of mechanisms underlying students' satisfaction | [30]      |
|         | Medicine; nursing   | Increased subjective level of knowledge about wound management  | Selection bias   | [31]      |
|         | Medicine; nursing   | Positive short-term effects in participants' perception of interprofessional competencies; positive long-term effects on socialization and collaboration                | Single center; small sample size; no control group; no instruments for objective assessments   | [32]      |
|         | Medicine and STEM (physics, engineering, computer science, and biomedical computing)  | Students' positive evaluation of course content and learning methods  | Small sample size; short observation; selection bias; no objective assessment  | [33]      |
|         | Medicine; psychology; social work; clinical education; educational science  | Students' positive evaluation of course structure, content, and multidisciplinary setting; students' perception of an "artificial dividing line" between professions    | Not reported   | [34]      |
|         | Medicine; nursing   | Feasibility of the program; students' positive evaluation of course scope and learning methods and need of improvement of practical learning outcomes                   | Small sample size; no objective measurements of learning outcomes  | [35]      |
|         | Medicine; nursing; physiotherapy; not specified   | Students' positive evaluation of course content, atmosphere, and learning activities  | Selection bias; limited knowledge gain   | [36]      |
|         | Medicine; pharmacy  | students' positive perception of IPE program and increased subjective level of knowledge  | Not reported   | [37]      |
|         | Medicine  | Students' positive perception of IP practice setting, interprofessional relationships, and engagement in clinical teams   | Small sample size; selection-bias  | [38]      |
| UK      | Medicine; biomedical science  | Students' perception of increased understanding of roles in IPC; students' positive evaluation of course format   | Selection bias; complexity of the planning; poor internet connectivity; small-sample size  | [39]      |
|         | Medicine; nursing   | students' positive evaluation of course content and learning of teamwork and professional identity  | Students' unequal levels of clinical experience; no actual clinical practice cases; use of a standardized questionnaire with limited validity            | [40]      |
|         | Medicine; mental health nursing; clinical psychology  | increase in students' self-reported knowledge, confidence, and attitudes  | No comparison of educational interventions; small sample size; no validated measures of learning outcomes  | [41]      |
|         | Medicine; nursing   | increase in team performance, as evaluated by instructors   | Possible influences between control and experimental groups  | [42]      |
|         | Medicine; nursing   | students' self-reported increase of care knowledge of professional roles and limitations within the team  | Selection bias; small sample size; no control group  | [43]      |
|         | Medicine; nursing; pharmacy; physician associate; physiotherapy; midwifery; occupational therapy; speech and language therapy         | Students' positive perception of interaction with other professionals and multidisciplinary teams; students' self-reported increased knowledge about professional roles | Trainers' lack of awareness of the sessions  | [44]      |
|         | Medicine; nursing   | Students' self-reported gain in understanding of other profession's roles, competences and in awareness about holistic patient care                                     | Not reported   | [45]      |
|         | Medicine; nursing; graduate healthcare providers  | Students' satisfaction with the course and increase in confidence in interprofessional communication; perceived self-efficacy over a six-month period                   | No objective measures  | [46]      |
|         | Medicine; nursing; occupational therapy; physiotherapy; biomedical laboratory science; medical biology; speech and language pathology | Students' self-reported increase in knowledge about professional roles and the value of teamwork  | Evaluation instrument was not a validated and contained only three questions   | [47]      |
|         | Medicine; nursing   | Students' satisfaction with course and perceived gain in preparedness for their clinical placement  | Small sample size; selection bias; no standardized measures  | [48]      |
| Sweden  | Medicine; nursing; physiotherapy; occupational therapy  | Students' self-reported increased knowledge of IPC, communication, and teamwork   | No gender specific results; no control group   | [49]      |

Table 1. Cont.

| Country                | Target Population                                   | Key Outcome   | Key Limitation  | Reference |
|------------------------|---|---|---|-----------|
| Belgium                | Medicine; physiotherapy; nursing; nutrition         | Students' self-reported increase positive attitude toward IPC and perception of competence  | Inadequate reliability of the scales; participants were not blinded to the intervention                   | [50]      |
| Bosnia and Herzegovina | Medicine; dentistry; nursing                        | Students' positive self-assessment of communication and teamwork skills   | Single-site study; assessment at one point in time; self-assessment                                       | [51]      |
| Croatia                | Medicine; pharmacy                                  | Students' reported increase in positive attitude towards IPC  | single site setting; convenience sampling; small sample size; low response rate; reliability of measures  | [52]      |
| Denmark                | Medicine; nursing                                   | Students' positive evaluation of IP training  | No objective measures; single site setting; small sample size   | [53]      |
| Finland                | Medicine; nursing                                   | Students' self-assessed increase of knowledge and competence  | Small sample size; selection bias; no standardized measures   | [54]      |
| Italy                  | Medicine; nursing                                   | Students reported positive attitudes toward communication skills; high levels of self-confidence and attitude toward learning in simulation   | Selection bias; no objective measures; limited transferability of simulations                             | [55]      |
| Netherlands            | Medicine; nursing.                                  | Students' positive self-assessment of knowledge gain in roles and responsibilities, improvement in patient care   | Single site setting; interviewer was the teacher (social desirability bias); lack of long-term assessment | [56]      |
| Norway                 | Medicine; nursing.                                  | Students' satisfaction with course material and self-reported increased insight ins about communication, teamwork and leadership Facilitators reported students' knowledge gain in non-technical skills | No objective measures   | [57]      |
| Poland                 | Medicine; pharmacy                                  | Students' self-reported strengthening of their self-confidence and understanding of patient care skills   | Small sample size   | [58]      |
| Switzerland            | Medicine; healthcare techniques                     | Students' satisfaction with course; students reported a better understanding of roles   | Selection bias; no objective measures; no assessment of learning  | [59]      |
| Turkey                 | Medicine; nursing; nutrition-dietetics; social work | Students' self-reported gain in interdisciplinary education, perception, and teamwork attitude  | Difficulties in IPE program planning; no objective changes of students' behavior                          | [60]      |

The time frame of publication of the included papers was from 2009 to 2022, with only four [34,35,47,49] of them being published before 2017.

Of the 32 papers, seven explicitly mentioned the theoretical background on which the intervention was based. These included peer-assisted learning [30,36,59], Jeffries simulation theory [55], Bandura self-efficacy theory [46], Knowles's principles for Adult Learning as guidelines [53], goal theory perspective [59], model of inter-professionality, Beck's cognitive model, and social capital theory [56]. The remaining papers did not explicitly mention the theoretical background of the IPE program [29,31–35,37–45,47–52,54,57,58,60].

With respect to the content, the learners were introduced to interprofessional collaborations via exposure to examples of interprofessional care of patients with specific clinical conditions (e.g., wound, ulcers, dementia, diabetes, and breast cancer) in actual setting or in simulation scenarios [31–33,35,45,50,51,54,60]. Nine papers reported that the content of the IPE intervention included explicit training on the different professional roles [29,32,34–36,51,54,56,57], and seven papers reported IPE interventions that included training in communication skills [30,32,35,36,40,49,57].

All the studies included students who had completed their third semester of medical training. In terms of the professional programs being undertaken by the students included in the studies, interventions were directed toward students in one to eight professional programs (Table 1).

Several studies (n = 16) included students from two professions only [29,31,32,37,40,42,43,45,48,52–58]. In addition to medical students, twenty-three studies included nursing, six papers included physiotherapy, four papers included pharmacology, and only two papers included psychology students (Table 1).

With respect to the outcomes, the focus was on students' satisfaction with the IPE experience and self-reported gain in knowledge and skills. All studies reported that the outcomes were measured using ad hoc scales and surveys created specifically for the study [29–36]. Eight studies [29,40,42,50–52,55,60] also used validated questionnaires to measure students' self-reported experience perception. However, as acknowledged by the authors, the used questionnaires have limited validity.

With respect to the professions of the educators, all the studies reported that the team of educators was composed of “experts” from different professions, including academic tutors and clinical supervisors. No study reported information on educators' IPE training experience background, except one paper based on an interprofessional tutor qualification program [30].

The authors reported several limitations in their studies, from a lack of objective outcome measures [30,32,33,35,41,46–48,51,53,54,57,59,60] to the selection bias of the participants [29,31,33,36,38,39,43,48,54,55,59], and lack of control groups [30,32,43,49]. A description of the limitations is provided in Table 1.

#### 4. Discussion

To the best of our knowledge, this is the first review to specifically focus on IPE in undergraduate medical education in EHEA countries. The results show that there is a growing interest in integrating IPE into undergraduate medical education in EHEA countries, as suggested by the rapidly expanding number of studies conducted on IPE in undergraduate curricula over the last five years. Interest in the assessment of IPE interventions is prominent in northern Europe, especially in Germany, the UK, and Sweden.

The IPE interventions reported in the retrieved papers are heterogeneous in terms of content and assessment measures. Specifically, the content varies from interprofessional collaboration needed for caring for patients with specific clinical conditions [35,45,54] to understanding professional roles, communication skills, and teamwork in general healthcare interprofessional settings [36,55]. All findings fell in the first two levels of Kirkpatrick's four-level outcome model [61].

Most of the papers' authors acknowledged that the studies had several methodological limitations, such as a self-selection bias in studies that involved voluntary participation in IPE [29,31,33,36,38,39,43,48,54,55,59]. Moreover, the evaluation was based on ad hoc measures created for the specific study e.g., [34,46,48,53,57]. It is also worth noting that the study designs were predominantly based on post-intervention surveys only and did not include control groups [30,32,43,49]. As a result, the generalizability of the results reported in these studies on IPE is weak.

The findings of this review also highlight that limited attention has been paid to the foundational theories upon which the various IPE interventions are based. Despite numerous theories being available in the medical education literature that could be referenced when designing IPE programs [62], most of the reviewed papers did not explicitly state the theoretical background for the development and planning of the IPE interventions. In addition, the studies conducted to date have focused on IPE in a limited number of professional program types. Specifically, in almost half of the studies, the target learners were medical students and nursing students only. Therefore, the other student professions have been underrepresented, leading to the risk of a partial picture of the complexity and richness of teamwork in healthcare settings. Despite the relevant roles that psychologists, informatics, and biomedical professionals play in several healthcare settings, only a limited number of studies included students from these professions [33,34,39,41,47]. Furthermore, information about the IPE training of the educators was not systematically specified across the papers. This prevents us from gaining a better understanding of the educator's role in modulating students' attitudes, interests, and knowledge, as well as the effects of IPE on educators.

Another aspect of IPE that warrants attention is the career stage of the students. In most of the reviewed studies, the participating students were undergraduate medical students in their final years. Given that it has been proposed that IPE is important in the early stages of training [16], there is a need to extend educational programs and related studies on IPE interventions to the early years of the undergraduate curriculum.

Taken together, the findings of this review indicate that there is a need to further the IPE research agenda in countries of the EHEA. Building on the pioneering studies reviewed here, future studies should explicitly focus on the education theories guiding IPE programs. The development of programs could be informed by theories central to interprofessional education, such as adult learning theories [63–65], which acknowledge learners' preference for real-life task-oriented activities, and self-determination theory, which posits that the satisfaction of basic needs of autonomy, competence, and relatedness play a key role in sustaining intrinsic motivation in learning [66,67].

Although the distributed cognition process was not explicitly addressed in the reviewed studies, it must be considered for the future development of IPE programs as it is involved in interprofessional collaboration. The distributed cognition theory [68–70] posits that cognitive processes are not individually produced, but emerge from the collaborative activities of group members. Accordingly, cognition is decentralized in a system, and it is encultured. This theory is relevant for stimulating students' reflections on the advantages of differences in individual cognitive properties in international interprofessional learning groups and in critical care setting collaborations.

Regarding the content of IPE, future programs should extend their focus to barriers to international interprofessional education and collaboration. Given that WHO campaigned for the worldwide expansion of IPE [71], IPE programs would benefit from including sessions on barriers to international interprofessional collaboration. Potential barriers include different ways to deliver healthcare across countries as well as the cultural characteristics of each country. Thus, international interprofessional collaborative practices may be challenged by differences among countries in terms of health system structures, healthcare financial resources, epidemiological trends, health worker training, and cultural contexts.

From a methodological perspective, it is fundamental to establish standardized pre- and post-intervention measures and protocols for the measurement of the target dependent variables, to include students from different professions and control groups (e.g., students from non-healthcare professions), and to describe the backgrounds of the educators. In addition, given the key role of emotions in learning [72,73] and in interprofessional healthcare [74], future studies should include measures of the affective dimension of learning, such as changes of achievement emotions [72], learning performance to emotionally salient educational material [75], students' emotional traits and needs [76,77], and modulation of students' response bias [78]. Furthermore, given the limited validity of the available questionnaires to measure interprofessional attitude and skills, the development of instruments based on available data and consensus statements are warranted. In addition, to enhance the evidence base of IPE, future studies should compare the efficacy of IPE interventions that directly expose participants to key aspects of interprofessional collaboration (e.g., understanding others' professional roles and communication skills) with interventions that focus on modeling interprofessional collaboration for patient care. It is also important to examine and compare the efficacy of IPE interventions with a multifaceted format that combines direct exposure to interprofessional collaboration topics and modeling of interprofessional patient care. Furthermore, it is recommended to include measures of simulated patients' perceptions before and after participating in IPE. Key recommendations are summarized in Table 2.

**Table 2.** Key recommendations for IPE development and evaluation.

| Practical Recommendations for Future Research and Educational Programs |   |
|--|---|
| Theoretical background   | <ul style="list-style-type: none"> <li>Identify and explicitly state the theoretical background of IPE interventions</li> </ul>   |
| Methods  | <ul style="list-style-type: none"> <li>Include sessions on barriers to international interprofessional collaboration.</li> <li>Explicitly state information about the IPE training of the educators.</li> <li>Expand the number of professional program types to provide students with a picture of the complexity of teamwork in healthcare.</li> <li>Extend educational programs and research studies to the early years of the undergraduate curriculum.</li> <li>Establish standardized pre- and post-intervention measures and/or include control groups.</li> </ul> |
| Evaluation and effectiveness   | <ul style="list-style-type: none"> <li>Compare the efficacy of IPE interventions based on exposure to topics versus interventions based on modeling of interprofessional collaboration.</li> <li>Include measures of the affective dimension of learning, such as changes of students' achievement emotions and response bias.</li> <li>Create accreditation standards for international IPE.</li> </ul>  |

The integration of top-down and bottom-up strategies would facilitate the development of IPE programs in the EHEA. Taking a top-down perspective, in line with the Bologna process, we propose the establishment of evidence-based accreditation standards that promote transparency in the theoretical background used, duration, workload, and learning outcomes of international IPE programs. Simultaneously, from a bottom-up perspective, it is crucial to ensure academic freedom and institutional autonomy in designing methods and assessments tailored to the specific educational context.

This review is not exempt from limitations. First, we reviewed papers published in English, with the risk of not representing IPE experiences reported in other languages. Second, we reviewed the papers at the final stage of publication, leaving open the possibility of underrepresenting IPE experiences in undergraduate medical education. Third, despite searching a widely used database and extending our search to include cited documents, it is possible that the nature of the search strategy led to relevant papers being missed. Furthermore, we did not compare the IPE interventions between EHEA and non-EHEA countries. Thus, we cannot compare the development and implementation of the IPE concept between EHEA and non-EHEA countries.

Despite these limitations, the findings of this review contribute to the progress of a consensus on the development of IPE programs for undergraduate medical students to be implemented across EHEA countries. As the results suggest, there is a need for agreement and consistency across EHEA countries in reporting theories, educational methods, and standardized IPE evaluation measures. In addition, we advocate for EHEA countries to collaborate and include IPE from the first years of undergraduate education and invest efforts into including in IPE a broader representation of professions involved in healthcare settings. Joint efforts by EHEA countries to develop standardized protocols for IPE programs would facilitate the Bologna Process and enhance staff and students' mobility and international mutual recognition of qualifications. In turn, the increased quality and quantity in international and interprofessional collaborations would potentiate the professional resources needed to face the continuous challenges in cross-border healthcare.

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**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A

### *Search Key Words*

#### SCOPUS:

(TITLE-ABS-KEY (interprofessional AND learning AND activities)) AND (LIMIT-TO (AFFILCOUNTRY, "Albania") OR LIMIT-TO (AFFILCOUNTRY, "Andorra") LIMIT-TO (AFFILCOUNTRY, "Armenia") OR LIMIT-TO (AFFILCOUNTRY, "Austria") OR LIMIT-TO (AFFILCOUNTRY, "Azerbaijan") OR LIMIT-TO (AFFILCOUNTRY, "Belarus") OR LIMIT-TO (AFFILCOUNTRY, "Belgium") OR LIMIT-TO (AFFILCOUNTRY, "Bosnia ") OR LIMIT-TO (AFFILCOUNTRY, "Herzegovina") OR LIMIT-TO (AFFILCOUNTRY, "Bulgaria") OR LIMIT-TO (AFFILCOUNTRY, "Croatia") OR LIMIT-TO (AFFILCOUNTRY, "Cyprus") OR LIMIT-TO (AFFILCOUNTRY, "Czech Republic") OR LIMIT-TO (AFFILCOUNTRY, "Denmark") LIMIT-TO (AFFILCOUNTRY, "Estonia") OR LIMIT-TO (AFFILCOUNTRY, "Finland") OR LIMIT-TO (AFFILCOUNTRY, "France") OR LIMIT-TO (AFFILCOUNTRY, "Georgia") OR LIMIT-TO (AFFILCOUNTRY, "Germany") OR LIMIT-TO (AFFILCOUNTRY, "Greece") OR LIMIT-TO (AFFILCOUNTRY, "Holy See") OR LIMIT-TO (AFFILCOUNTRY, "Hungary") OR LIMIT-TO (AFFILCOUNTRY, "Iceland") OR LIMIT-TO (AFFILCOUNTRY, "Ireland") LIMIT-TO (AFFILCOUNTRY, "Italy") OR LIMIT-TO (AFFILCOUNTRY, "Kazakhstan") OR LIMIT-TO (AFFILCOUNTRY, "Latvia") OR LIMIT-TO (AFFILCOUNTRY, "Liechtenstein") OR LIMIT-TO (AFFILCOUNTRY, "Lithuania") OR LIMIT-TO (AFFILCOUNTRY, "Luxembourg") OR LIMIT-TO (AFFILCOUNTRY, "Malta") OR LIMIT-TO (AFFILCOUNTRY, "Moldova") OR LIMIT-TO (AFFILCOUNTRY, "Montenegro") OR LIMIT-TO (AFFILCOUNTRY, "Netherlands") OR LIMIT-TO (AFFILCOUNTRY, "North Macedonia") OR LIMIT-TO (AFFILCOUNTRY, "Norway") LIMIT-TO (AFFILCOUNTRY, "Poland") OR LIMIT-TO (AFFILCOUNTRY, "Portugal") OR LIMIT-TO (AFFILCOUNTRY, "Romania") OR LIMIT-TO (AFFILCOUNTRY, "Russian Federation") OR LIMIT-TO (AFFILCOUNTRY, "San Marino") OR LIMIT-TO (AFFILCOUNTRY, "Serbia") OR LIMIT-TO (AFFILCOUNTRY, "Slovak Republic ") OR LIMIT-TO (AFFILCOUNTRY, "Slovenia") OR LIMIT-TO (AFFILCOUNTRY, "Spain") OR LIMIT-TO (AFFILCOUNTRY, "Sweden") OR LIMIT-TO (AFFILCOUNTRY, "Switzerland")OR LIMIT-TO (AFFILCOUNTRY, "Turkey") OR LIMIT-TO (AFFILCOUNTRY, "Ukraine") OR LIMIT-TO (AFFILCOUNTRY, "United Kingdom") OR LIMIT-TO (AFFILCOUNTRY, "Scotland") OR LIMIT-TO (AFFILCOUNTRY, "Undefined")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English"))

Results: 316 papers; Year range: 2013–2022.

#### MEDLINE:

(Albania [Affiliation]) OR (Andorra [Affiliation]) OR (Armenia [Affiliation]) OR (Austria [Affiliation]) OR (Azerbaijan [Affiliation]) OR (Belarus [Affiliation]) OR (Belgium [Affiliation]) OR (Bosnia [Affiliation]) OR (Herzegovina [Affiliation]) OR (Bulgaria [Affiliation]) OR (Croatia [Affiliation]) OR (Cyprus [Affiliation]) OR (Czech Republic [Affilia-

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Results: 244; Year range: 2000–2022.

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