Barriers perceived by university faculty in implementing interprofessional education: A scoping review protocol

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ABSTRACT

Interprofessional Education (IPE) enhances collaboration among health professionals and improves patient care. Despite its benefits, university implementation of IPE is limited due to various barriers perceived by faculty members. Identifying these barriers is crucial for developing strategies to integrate IPE into higher education curricula. This scoping review protocol outlines a study to map and synthesize literature on barriers perceived by university faculty in implementing IPE, aiming to inform future interventions and research. Following the Joanna Briggs Institute methodology and adhering to PRISMA-ScR guidelines, a comprehensive search will be conducted across databases including PubMed, Embase, CINAHL, Scopus, Web of Science, and Google Scholar without time restrictions. All types of publications focusing on faculty-perceived barriers to IPE will be included. Data extraction and analysis will involve thematic synthesis and advanced topic modeling using the OCTIS framework to identify key themes and patterns. The review will provide an overview of the types of barriers faced by faculty, their causes, and proposed strategies to overcome them, offering valuable insights for enhancing IPE integration in university settings.

- The scoping review will map existing literature on faculty-perceived barriers to implementing Interprofessional Education.
- Advanced topic modeling with the OCTIS framework will be utilized to analyze and synthesize findings.
- The outcomes aim to inform strategies for effective IPE integration in higher education curricula.

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Specifications table

Subject area:	Medicine and Dentistry
More specific subject area:	Nursing
Name of your protocol:	Barriers Perceived by University Faculty in Implementing Interprofessional Education: A Scoping Review Protocol
Reagents/tools:	None.
Experimental design:	Not applicable.
Trial registration:	Not applicable.
Ethics:	This scoping review will utilize data from previously published studies and does not involve human participants, animal experiments, or data collected from social media platforms. Therefore, ethical approval and informed consent are not required for this study.
Value of the Protocol:	• This protocol fills a significant void in existing research by systematically mapping the barriers perceived by university faculty in implementing IPE, offering a comprehensive understanding of challenges that hinder IPE integration in higher education. • The insights gained from the scoping review will inform the development of targeted strategies and interventions to overcome identified barriers, ultimately enhancing faculty capacity to deliver IPE and preparing students for collaborative professional practice. • Utilizing the OCTIS framework with Bayesian optimization for topic modeling introduces advanced analytical techniques to educational research, enhancing the depth and rigor of data analysis and setting a precedent for future studies in the field.

Background

Interprofessional Education (IPE) has been widely recognized by the World Health Organization (WHO) and is continually advocated by policymakers, health professionals, and educators as an effective means to address the challenges of fragmented healthcare systems [17,20]. The WHO acknowledges that many health systems worldwide suffer from fragmentation and workforce shortages, leading to difficulties in managing increasingly complex patient needs [20]. IPE is essential to ensure the development of healthcare services in resource-limited settings [2,4,16].

IPE involves students from two or more different professions learning together, from and with each other, to improve the quality of patient and community care [8,16,17,20]. It promotes interaction among health professionals from various disciplines, positively influencing professional practice, enhancing clinical outcomes, improving patient safety, reducing healthcare errors, and consequently leading to resource savings and reduced costs [2,3,14]. Despite the recognized benefits of IPE, its implementation remains limited [8]. The 2022 final report of the global situational analysis of IPE confirms that half of the institutions worldwide have not yet established IPE programming, and among those that do, 50 % have offered it for less than five years [6,7]. The growth and status of IPE vary significantly among institutions in countries with different income levels and continue to be offered variably based on geographic and economic factors [6].

Implementing IPE is a complex and challenging endeavor [2–4,14–16]. Faculty play a crucial role in its successful integration into academic programs. However, they often face numerous barriers at the micro (students and faculty), *meso* (institutional), and macro (national government) levels [13]. These obstacles include personal and professional interests, power struggles, resource conflicts, rigid traditions, lack of experience or interest among faculty, curriculum time constraints, and logistical challenges. Such barriers can hinder faculty from effectively delivering IPE, and they are not comprehensively documented in a single source [6,7].

Despite the existence of several systematic reviews on IPE [3,5,13,14,20], there is a notable gap in the literature focusing on the barriers perceived by faculty members in implementing IPE [7]. Identifying these obstacles from the faculty's perspective could help institutions develop targeted interventions to facilitate the delivery of IPE. For this reason, this protocol outlines the methods for conducting a scoping review aimed at providing a comprehensive overview of the evidence regarding the nature and diversity of barriers faced by university faculty in implementing IPE across disciplines related to healthcare and geographical contexts.

Description of protocol

Design and research questions

The primary research question of the scoping review guided by this protocol incorporates these elements according to the "population, concept, context" (PCC) framework [10,19]: The population is given by university faculty, the concept is represented by barriers to IPE implementation, and the context is defined by university education (universities).

In this scoping review, this primary question will guide the development of inclusion criteria and facilitate a systematic literature search during the scoping review process [12]. The primary research question is: "What literature exists on the barriers perceived, identified, or faced by university faculty that hinder the integration, delivery, or strengthening of IPE in universities?"

To ensure comprehensive coverage of the evidence, we have formulated secondary, more specific research questions related to the primary question [11]. The inclusion of these specific questions will allow us to delve deeper into the details of the barriers and challenges faced by faculty members, providing precise insights into what will be examined and mapped [11]. More precisely, secondary research questions (RQs) were:

• RQ1: What are the causes of each identified barrier?
• RQ2: Which objectives does each specific barrier prevent faculty from achieving in relation to IPE?

- RQ3: What suggestions or strategies have faculty proposed or implemented to address these barriers and challenges in supporting the implementation of IPE?
- RQ4: What differences exist based on the geographical context of origin?

We aim to classify them based on key characteristics and contributing factors by exploring the determinants underlying each specific barrier (RQ1). Understanding the specific aspects of IPE implementation that are most affected by the barriers will provide insights into their impact on faculty goals (RQ2). Identifying existing strategies will offer valuable information on potential solutions and best practices to overcome the identified obstacles (RQ3). Examining geographical variations will reveal how barriers and potential solutions may differ across different regions and cultural settings (RQ4).

Eligibility criteria

The eligibility criteria for this scoping review are established based on the PCC framework to comprehensively capture the literature on barriers faced by university faculty in implementing IPE. The population of interest includes university faculty members involved in the delivery, integration, or strengthening of IPE within higher education institutions. The concept focuses on barriers perceived, identified, or experienced by faculty that hinder the implementation of IPE, encompassing obstacles at personal, interpersonal, institutional, or systemic levels. The context encompasses universities and higher education institutions worldwide, without geographical limitations.

All types of publications are eligible for inclusion, regardless of methodological approach or the presence of empirical data. This includes empirical studies—quantitative, qualitative, or mixed methods—as well as theoretical papers, literature reviews, commentaries, editorials, conference proceedings, dissertations, and policy documents. There are no restrictions on publication date to ensure a comprehensive scope of literature is considered. Only publications available in English will be included, and studies must be accessible in full-text format, including those available in HTML versions to facilitate content evaluation.

Studies lacking an accessible full-text version or not available in HTML format will be excluded, as the absence of an HTML version limits the feasibility of translating non-English texts and hinders the ability to assess the content's relevance and accuracy concerning the scoping review's objectives.

Further exclusion criteria include studies focusing solely on populations other than university faculty—such as students or healthcare professionals not in an academic role—without addressing faculty perspectives. Publications that do not address barriers to IPE implementation from the faculty perspective will also be excluded. Studies conducted outside the context of higher education institutions or unrelated to IPE are likewise excluded.

Type of sources

Eligible sources encompass empirical studies—quantitative, qualitative, and mixed methods—as well as theoretical papers, literature reviews, commentaries, editorials, conference proceedings, dissertations, and policy documents. All identified studies from the literature search that satisfy the inclusion criteria will be considered, regardless of their methodological approach or the presence of empirical data. This inclusive strategy ensures that both peer-reviewed and non-peer-reviewed literature contributes to the understanding of the research topic. The inclusion of diverse source types is critical for mapping the breadth and depth of existing evidence, theories, and discussions surrounding faculty-perceived barriers to IPE implementation.

In the event that the comprehensive search yields a limited number of eligible studies, grey literature will be reviewed to capture hard-to-find or unpublished sources that may offer valuable insights. Grey literature may include reports from governmental and non-governmental organizations, institutional repositories, theses and dissertations, conference abstracts, and other relevant documents not indexed in major academic databases. The inclusion of grey literature is essential to mitigate publication bias and to ensure a more exhaustive understanding of the topic, as it can reveal findings not reported in traditional academic publications.

Search strategy

Potentially relevant records will be identified by systematically searching multiple electronic databases without any time restrictions. The databases to be searched include Medline via PubMed, Embase, CINAHL, Scopus, Web of Science, and Google Scholar. The search strategies were initially developed for PubMed and then adapted for use in the other databases to ensure a comprehensive retrieval of relevant literature, as shown in Table 1.

The search strategy will employ a combination of keywords and controlled vocabulary terms related to the core concepts of IPE, university faculty, and barriers to implementation. This approach is designed to capture all pertinent studies addressing the barriers perceived or experienced by university faculty in implementing IPE. These strategies include specific search terms, synonyms, and Boolean operators used to combine the concepts effectively. The search strings were carefully constructed to maximize sensitivity and specificity, minimizing the omission of relevant studies while reducing the retrieval of irrelevant ones.

In addition to database searches, the reference lists of all included studies will be manually screened to identify any additional relevant publications not captured through the electronic searches. If the comprehensive search yields a limited number of eligible studies, grey literature will be reviewed to capture hard-to-find or unpublished sources that may offer valuable insights. This may include organizational reports, conference proceedings, dissertations, and policy documents relevant to the research questions.

All search results will be imported into reference management software, and duplicates will be removed. Two independent reviewers will screen the titles and abstracts of the retrieved records against the inclusion and exclusion criteria. Full-text articles

Table 1
Preliminary search strategy.

Database	Preliminary Query	Records Oct 7th, 2024
MEDLINE via *PubMed*	("Educational Personnel"[Title/Abstract] OR ("personnel*"[Title/Abstract] AND ("educability"[Title/Abstract] OR "educable"[Title/Abstract] OR "educates"[Title/Abstract] OR "education"[MeSH Subheading] OR "education"[Title/Abstract] OR "educational status"[Title/Abstract] OR ("educational"[Title/Abstract] AND "status"[Title/Abstract]) OR "educational status"[Title/Abstract] OR "education"[Title/Abstract] OR "education s"[Title/Abstract] OR "educational"[Title/Abstract] OR "educative"[Title/Abstract] OR "educator"[Title/Abstract] OR "educator s"[Title/Abstract] OR "educators"[Title/Abstract] OR "teaching"[Title/Abstract] OR "teaching"[Title/Abstract] OR "educate"[Title/Abstract] OR "educated"[Title/Abstract] OR "educating"[Title/Abstract] OR "educations"[Title/Abstract])) OR "Faculty"[Title/Abstract] OR ("Faculty"[Title/Abstract] OR "Faculty"[Title/Abstract] OR "faculties"[Title/Abstract] OR "faculty s"[Title/Abstract]) OR ("professor*"[Title/Abstract] AND ("universiti"[Title/Abstract] OR "universities"[Title/Abstract] OR "universities"[Title/Abstract] OR "university"[Title/Abstract] OR "university s"[Title/Abstract]))) AND ("interprofession*"[Title/Abstract] OR "inter profession*"[Title/Abstract] OR ("interdisciplin*"[Title/Abstract] OR "inter disciplin*"[Title/Abstract]) OR ("interoccupation*"[Title/Abstract] OR "inter occupation*"[Title/Abstract]) OR ("interinstitut*"[Title/Abstract] OR "inter institut*"[Title/Abstract]) OR ("interagen*"[Title/Abstract] OR "inter agen*"[Title/Abstract]) OR ("intersector*"[Title/Abstract] OR "inter sector*"[Title/Abstract]) OR ("interdepartment*"[Title/Abstract] OR "inter department*"[Title/Abstract]) OR ("interorganization*"[Title/Abstract] OR "inter organization*"[Title/Abstract]) OR "interprofessional relations"[Title/Abstract] OR "team*"[Title/Abstract] OR ("multiprofession*"[Title/Abstract] OR "multi profession*"[Title/Abstract]) OR ("multidisciplin*"[Title/Abstract] OR "multi disciplin*"[Title/Abstract]) OR ("multiinstitution*"[Title/Abstract] OR "multi institution*"[Title/Abstract]) OR ("multioccupation*"[Title/Abstract] OR "multi occupation*"[Title/Abstract]) OR ("multiagenc*"[Title/Abstract] OR "multi agenc*"[Title/Abstract]) OR ("multisector*"[Title/Abstract] OR "multi sector*"[Title/Abstract]) OR ("multiorganization*"[Title/Abstract] OR "multi organization*"[Title/Abstract]) OR "professional-patient relations"[Title/Abstract] OR ("transprofession*"[Title/Abstract] OR "trans profession*"[Title/Abstract]) OR ("transdisciplin*"[Title/Abstract] OR "trans disciplin*"[Title/Abstract])) AND ("challenge*"[Title/Abstract] OR "barrier*"[Title/Abstract] OR "difficult*"[Title/Abstract] OR "threat*"[Title/Abstract] OR "hazard*"[Title/Abstract] OR "impediment*"[Title/Abstract] OR "obstacle*"[Title/Abstract] OR "limit*"[Title/Abstract])	3.678 *no filters or time limits*
Embase	('Educational Personnel':ti,ab OR (personnel*:ti,ab AND (educability:ti,ab OR educable:ti,ab OR educates:ti,ab OR education:lnk OR education:ti,ab OR 'educational status':ti,ab OR (educational:ti,ab AND status:ti,ab) OR 'educational status':ti,ab OR education:ti,ab OR 'education s':ti,ab OR educational:ti,ab OR educative:ti,ab OR educator:ti,ab OR 'educator s':ti,ab OR educators:ti,ab OR teaching:ti,ab OR teaching:ti,ab OR educate:ti,ab OR educated:ti,ab OR educating:ti,ab OR educations:ti,ab)) OR Faculty:ti,ab OR (Faculty:ti,ab OR Faculty:ti,ab OR faculties:ti,ab OR 'faculty s':ti,ab) OR (professor*:ti,ab AND (universiti:ti,ab OR universities:ti,ab OR universities:ti,ab OR university:ti,ab OR 'university s':ti,ab))) AND (interprofession*:ti,ab OR 'inter profession*':ti,ab OR (interdisciplin*:ti,ab OR 'inter disciplin*':ti,ab) OR (interoccupation*:ti,ab OR 'inter occupation*':ti,ab) OR (interinstitut*:ti,ab OR 'inter institut*':ti,ab) OR (interagen*:ti,ab OR 'inter agen*':ti,ab) OR (intersector*:ti,ab OR 'inter sector*':ti,ab) OR (interdepartment*:ti,ab OR 'inter department*':ti,ab) OR (interorganization*:ti,ab OR 'inter organization*':ti,ab) OR 'interprofessional relations':ti,ab OR team*:ti,ab OR (multiprofession*:ti,ab OR 'multi profession*':ti,ab) OR (multidisciplin*:ti,ab OR 'multi disciplin*':ti,ab) OR (multiinstitution*:ti,ab OR 'multi institution*':ti,ab) OR (multioccupation*:ti,ab OR 'multi occupation*':ti,ab) OR (multiagenc*:ti,ab OR 'multi agenc*':ti,ab) OR (multisector*:ti,ab OR 'multi sector*':ti,ab) OR (multiorganization*:ti,ab OR 'multi organization*':ti,ab) OR 'professional-patient relations':ti,ab OR (transprofession*:ti,ab OR 'trans profession*':ti,ab) OR (transdisciplin*:ti,ab OR 'trans disciplin*':ti,ab)) AND (challenge*:ti,ab OR barrier*:ti,ab OR difficult*:ti,ab OR threat*:ti,ab OR hazard*:ti,ab OR impediment*:ti,ab OR obstacle*:ti,ab OR limit*:ti,ab)	6.067 *no filters or time limits*
CINAHL	((TI "Educational Personnel" OR AB "Educational Personnel") OR ((TI personnel* OR AB personnel*) AND ((TI educability OR AB educability) OR (TI educable OR AB educable) OR (TI educates OR AB educates) OR (MW education) OR (TI education OR AB education) OR (TI "educational status" OR AB "educational status") OR ((TI educational OR AB educational) AND (TI status OR AB status)) OR (TI "educational status" OR AB "educational status") OR (TI education OR AB education) OR (TI "education s" OR AB "education s") OR (TI educational OR AB educational) OR (TI educative OR AB educative) OR (TI educator OR AB educator) OR (TI "educator s" OR AB "educator s") OR (TI educators OR AB educators) OR (TI teaching OR AB teaching) OR (TI teaching OR AB teaching) OR (TI educate OR AB educate) OR (TI educated OR AB educated) OR (TI educating OR AB educating) OR (TI educations OR AB educations))) OR (TI Faculty OR AB Faculty) OR ((TI Faculty OR AB Faculty) OR (TI Faculty OR AB Faculty) OR (TI faculties OR AB faculties) OR (TI "faculty s" OR AB "faculty s")) OR ((TI professor* OR AB professor*) AND ((TI universiti OR AB universiti) OR (TI universities OR AB universities) OR (TI universities OR AB universities) OR (TI university OR AB university) OR (TI "university s" OR AB "university s")))) AND ((TI interprofession* OR AB interprofession*) OR (TI "inter profession*" OR AB "inter profession*") OR ((TI interdisciplin* OR AB interdisciplin*) OR (TI "inter disciplin*" OR AB "inter disciplin*")) OR ((TI interoccupation* OR AB interoccupation*) OR (TI "inter occupation*" OR AB "inter occupation*")) OR ((TI interinstitut* OR AB interinstitut*) OR (TI "inter institut*" OR AB "inter institut*")) OR ((TI interagen* OR AB interagen*) OR (TI "inter agen*" OR AB "inter agen*")) OR ((TI intersector* OR AB intersector*) OR (TI "inter sector*" OR AB "inter sector*")) OR ((TI interdepartment* OR AB interdepartment*) OR (TI "inter department*" OR AB "inter department*")) OR ((TI interorganization* OR AB interorganization*) OR (TI "inter organization*" OR AB "inter organization*")) OR (TI "interprofessional relations" OR AB "interprofessional relations") OR (TI team* OR AB team*) OR ((TI multiprofession* OR AB multiprofession*) OR (TI "multi profession*" OR AB "multi profession*")) OR ((TI multidisciplin* OR AB multidisciplin*) OR (TI "multi disciplin*" OR AB "multi disciplin*")) OR ((TI multiinstitution* OR AB multiinstitution*) OR (TI "multi institution*" OR AB "multi institution*")) OR ((TI multioccupation* OR AB multioccupation*) OR (TI "multi occupation*" OR AB "multi occupation*")) OR ((TI multiagenc* OR AB multiagenc*) OR (TI "multi agenc*" OR AB "multi agenc*")) OR ((TI multisector* OR AB multisector*) OR (TI "multi sector*" OR AB "multi sector*")) OR ((TI multiorganization* OR AB multiorganization*) OR (TI "multi organization*" OR AB "multi organization*")) OR (TI "professional-patient relations" OR AB "professional-patient relations") OR ((TI transprofession* OR AB transprofession*) OR (TI "trans profession*" OR AB "trans profession*")) OR ((TI transdisciplin* OR AB transdisciplin*) OR (TI "trans disciplin*" OR AB "trans disciplin*"))) AND ((TI challenge* OR AB challenge*) OR (TI barrier* OR AB barrier*) OR (TI difficult* OR AB difficult*) OR (TI threat* OR AB threat*) OR (TI hazard* OR AB hazard*) OR (TI impediment* OR AB impediment*) OR (TI obstacle* OR AB obstacle*) OR (TI limit* OR AB limit*))	1.784 *no filters or time limits*

Table 1 (*continued*)

Database	Preliminary Query	Records Oct 7th, 2024
Scopus *adv.*	(TITLE-ABS("Educational Personnel") OR (TITLE-ABS(personnel*) AND (TITLE-ABS(educability) OR TITLE-ABS(educable) OR TITLE-ABS(educates) OR INDEXTERMS(education) OR TITLE-ABS(education) OR TITLE-ABS("educational status") OR (TITLE-ABS(educational) AND TITLE-ABS(status)) OR TITLE-ABS("educational status") OR TITLE-ABS(education) OR TITLE-ABS("education s") OR TITLE-ABS(educational) OR TITLE-ABS(educative) OR TITLE-ABS(educator) OR TITLE-ABS("educator s") OR TITLE-ABS(educators) OR TITLE-ABS(teaching) OR TITLE-ABS(teaching) OR TITLE-ABS(educate) OR TITLE-ABS(educated) OR TITLE-ABS(educating) OR TITLE-ABS(educations))) OR TITLE-ABS(Faculty) OR (TITLE-ABS(Faculty) OR TITLE-ABS(Faculty) OR TITLE-ABS(faculties) OR TITLE-ABS("faculty s")) OR (TITLE-ABS(professor*) AND (TITLE-ABS(universiti) OR TITLE-ABS(universities) OR TITLE-ABS(universities) OR TITLE-ABS(university) OR TITLE-ABS("university s")))) AND (TITLE-ABS(interprofession*) OR TITLE-ABS("inter profession*") OR (TITLE-ABS(interdisciplin*) OR TITLE-ABS("inter disciplin*")) OR (TITLE-ABS(interoccupation*) OR TITLE-ABS("inter occupation*")) OR (TITLE-ABS(interinstitut*) OR TITLE-ABS("inter institut*")) OR (TITLE-ABS(interagen*) OR TITLE-ABS("inter agen*")) OR (TITLE-ABS(intersector*) OR TITLE-ABS("inter sector*")) OR (TITLE-ABS(interdepartment*) OR TITLE-ABS("inter department*")) OR (TITLE-ABS(interorganization*) OR TITLE-ABS("inter organization*")) OR TITLE-ABS("interprofessional relations") OR TITLE-ABS(team*) OR (TITLE-ABS(multiprofession*) OR TITLE-ABS("multi profession*")) OR (TITLE-ABS(multidisciplin*) OR TITLE-ABS("multi disciplin*")) OR (TITLE-ABS(multiinstitution*) OR TITLE-ABS("multi institution*")) OR (TITLE-ABS(multioccupation*) OR TITLE-ABS("multi occupation*")) OR (TITLE-ABS(multiagenc*) OR TITLE-ABS("multi agenc*")) OR (TITLE-ABS(multisector*) OR TITLE-ABS("multi sector*")) OR (TITLE-ABS(multiorganization*) OR TITLE-ABS("multi organization*")) OR TITLE-ABS("professional-patient relations") OR (TITLE-ABS(transprofession*) OR TITLE-ABS("trans profession*")) OR (TITLE-ABS(transdisciplin*) OR TITLE-ABS("trans disciplin*"))) AND (TITLE-ABS(challenge*) OR TITLE-ABS(barrier*) OR TITLE-ABS(difficult*) OR TITLE-ABS(threat*) OR TITLE-ABS(hazard*) OR TITLE-ABS(impediment*) OR TITLE-ABS(obstacle*) OR TITLE-ABS(limit*))	8.859 *no filters or time limits*
WoS *adv.*	((TI="Educational Personnel" OR AB="Educational Personnel") OR ((TI=personnel* OR AB=personnel*) AND ((TI=educability OR AB=educability) OR (TI=educable OR AB=educable) OR (TI=educates OR AB=educates) OR ALL=education OR (TI=education OR AB=education) OR (TI="educational status" OR AB="educational status") OR ((TI=educational OR AB=educational) AND (TI=status OR AB=status)) OR (TI="educational status" OR AB="educational status") OR (TI=education OR AB=education) OR (TI="education s" OR AB="education s") OR (TI=educational OR AB=educational) OR (TI=educative OR AB=educative) OR (TI=educator OR AB=educator) OR (TI="educator s" OR AB="educator s") OR (TI=educators OR AB=educators) OR (TI=teaching OR AB=teaching) OR (TI=teaching OR AB=teaching) OR (TI=educate OR AB=educate) OR (TI=educated OR AB=educated) OR (TI=educating OR AB=educating) OR (TI=educations OR AB=educations))) OR (TI=Faculty OR AB=Faculty) OR ((TI=Faculty OR AB=Faculty) OR (TI=Faculty OR AB=Faculty) OR (TI=faculties OR AB=faculties) OR (TI="faculty s" OR AB="faculty s")) OR ((TI=professor* OR AB=professor*) AND ((TI=universiti OR AB=universiti) OR (TI=universities OR AB=universities) OR (TI=universities OR AB=universities) OR (TI=university OR AB=university) OR (TI="university s" OR AB="university s")))) AND ((TI=interprofession* OR AB=interprofession*) OR (TI="inter profession*" OR AB="inter profession*") OR ((TI=interdisciplin* OR AB=interdisciplin*) OR (TI="inter disciplin*" OR AB="inter disciplin*")) OR ((TI=interoccupation* OR AB=interoccupation*) OR (TI="inter occupation*" OR AB="inter occupation*")) OR ((TI=interinstitut* OR AB=interinstitut*) OR (TI="inter institut*" OR AB="inter institut*")) OR ((TI=interagen* OR AB=interagen*) OR (TI="inter agen*" OR AB="inter agen*")) OR ((TI=intersector* OR AB=intersector*) OR (TI="inter sector*" OR AB="inter sector*")) OR ((TI=interdepartment* OR AB=interdepartment*) OR (TI="inter department*" OR AB="inter department*")) OR ((TI=interorganization* OR AB=interorganization*) OR (TI="inter organization*" OR AB="inter organization*")) OR (TI="interprofessional relations" OR AB="interprofessional relations") OR (TI=team* OR AB=team*) OR ((TI=multiprofession* OR AB=multiprofession*) OR (TI="multi profession*" OR AB="multi profession*")) OR ((TI=multidisciplin* OR AB=multidisciplin*) OR (TI="multi disciplin*" OR AB="multi disciplin*")) OR ((TI=multiinstitution* OR AB=multiinstitution*) OR (TI="multi institution*" OR AB="multi institution*")) OR ((TI=multioccupation* OR AB=multioccupation*) OR (TI="multi occupation*" OR AB="multi occupation*")) OR ((TI=multiagenc* OR AB=multiagenc*) OR (TI="multi agenc*" OR AB="multi agenc*")) OR ((TI=multisector* OR AB=multisector*) OR (TI="multi sector*" OR AB="multi sector*")) OR ((TI=multiorganization* OR AB=multiorganization*) OR (TI="multi organization*" OR AB="multi organization*")) OR (TI="professional-patient relations" OR AB="professional-patient relations") OR ((TI=transprofession* OR AB=transprofession*) OR (TI="trans profession*" OR AB="trans profession*")) OR ((TI=transdisciplin* OR AB=transdisciplin*) OR (TI="trans disciplin*" OR AB="trans disciplin*"))) AND ((TI=challenge* OR AB=challenge*) OR (TI=barrier* OR AB=barrier*) OR (TI=difficult* OR AB=difficult*) OR (TI=threat* OR AB=threat*) OR (TI=hazard* OR AB=hazard*) OR (TI=impediment* OR AB=impediment*) OR (TI=obstacle* OR AB=obstacle*) OR (TI=limit* OR AB=limit*)))	5.188 *no filters or time limits*

of potentially relevant studies will be obtained and assessed for eligibility. Any disagreements between reviewers will be resolved through consensus discussion. If a consensus cannot be reached, a third reviewer—an experienced researcher with expertise in healthcare education research and skilled in systematic and scoping review methodologies—will be consulted. This third reviewer will act as an impartial mediator, carefully evaluating the points of disagreement and providing a final decision on whether to include or exclude studies.

The databases will be re-searched upon publication of the protocol to include any newly published studies and ensure that the most current literature is considered. By employing a comprehensive and systematic search strategy across multiple databases and sources, the review aims to capture a wide range of literature on the barriers faced by university faculty in implementing IPE, ensuring that the scoping review provides a thorough overview of existing knowledge in this area.

Source of evidence selection

Following the completion of the systematic search, all identified citations will be collated and uploaded into Rayyan software for systematic reviews [9]. Duplicate records will be identified and removed to ensure an accurate and efficient screening process.

Two independent reviewers will then screen the titles and abstracts of the retrieved citations to evaluate their eligibility based on the predefined inclusion criteria. Studies that meet the inclusion criteria or where there is uncertainty will be retrieved in full text for further assessment.

The two reviewers will independently and thoroughly assess the full-text versions of the selected studies against the same inclusion and exclusion criteria. Throughout this process, they will document the reasons for excluding any studies at the full-text review stage that do not meet the inclusion criteria. This documentation will be reported in the final scoping review to maintain transparency and reproducibility.

Any disagreements or discrepancies between the reviewers during the selection process will be resolved through discussion to reach a consensus. If consensus cannot be achieved, a third reviewer will be consulted to mediate and make a final decision. The third reviewer will be a senior researcher with expertise in interprofessional education and a strong background in systematic and scoping review methodologies. This approach ensures that the selection process is objective and minimizes potential bias.

The complete results of the search and the study selection process will be detailed in the final review. A flow diagram, adhering to the PRISMA 2020 guidelines [10], will be used to illustrate the number of records identified, screened, assessed for eligibility, and included in the review, along with the reasons for exclusions at each stage. This visual representation will enhance the clarity and transparency of the selection process.

Data extraction

Data will be extracted from the selected studies by two independent reviewers using a data extraction tool specifically designed for this scoping review. This tool, implemented as a Microsoft Excel spreadsheet, has been developed by another reviewer to systematically capture detailed information relevant to the research questions. The data to be extracted encompass comprehensive details about the participants, the conceptual focus, context, study methodologies, and key findings pertinent to the barriers perceived by faculty in implementing IPE.

The data extraction tool will be dynamically refined throughout the extraction phase based on insights gained from each analyzed source. Any modifications to the tool will be meticulously recorded within the scoping review's documentation to maintain transparency and reproducibility. In instances where discrepancies arise between the reviewers during data extraction, these will be resolved through discussion to reach a consensus. If necessary, an additional reviewer will be consulted to mediate and assist in resolving any differences.

To enhance the completeness and accuracy of the data, authors of the included studies may be contacted to supply missing or additional information deemed relevant to the review. This proactive approach aims to ensure that the data extraction is as thorough as possible, capturing all pertinent details that contribute to addressing the research questions.

Additionally, the data extraction tool is designed to facilitate the creation of a textual corpus derived from the key findings of each study. This corpus will serve as the dataset for applying advanced analytical techniques based on a Bayesian optimization approach to identify topics within the textual data [1,18]. Two authors will independently evaluate each study and proceed with data extraction, ensuring rigor and reliability in the data collection process. A consensus discussion will be conducted to merge and compare the extractions and interpretations of the involved authors, further enhancing the validity of the extracted data.

Data analysis

The data extracted using the data extraction tool will be systematically compiled and rigorously analyzed to construct a comprehensive narrative synthesis that encapsulates the current understanding of barriers perceived by university faculty in implementing IPE. This synthesis will summarize the study findings and critically assess the methodologies employed across the included studies. To effectively present the complex information extracted, we will employ both tabular summaries and visual data representations, including flow diagrams of study selection, tables summarizing study characteristics, and figures illustrating key barriers and proposed strategies.

To rigorously analyze the textual corpus formed from the key findings of the included studies, we will employ the Optimizing and Comparing Topic Models Is Simple (OCTIS) framework [18]. This innovative tool facilitates the training, analysis, and comparison of various topic models, including the well-established Latent Dirichlet Allocation (LDA). The application of OCTIS represents a novel approach in the context of educational research on barriers to IPE implementation.

The primary advantage of using OCTIS lies in its integration of Bayesian Optimization, a strategy that optimizes the hyperparameters of topic models. This optimization is crucial as it allows us to adjust the parameters of models like LDA to enhance their performance specifically for our dataset, which consists of diverse texts concerning the barriers faced by faculty in implementing IPE. By determining the optimal configuration of these parameters, OCTIS ensures that the topic models generate more coherent and relevant topics, providing clearer insights into the underlying themes of the data [18].

Bayesian Optimization within OCTIS will guide the selection of hyperparameters to ensure that the resulting topics are statistically significant, meaningful, and interpretable in relation to the research questions posed by our scoping review. Specifically, it will help us map literature trends and uncover potentially hidden patterns in studies that have explored faculty-perceived barriers to IPE implementation.

The novelty of utilizing OCTIS in this context lies in its ability to systematically compare different topic models and optimize them for our specific dataset, enhancing the robustness and validity of our thematic analysis. By applying OCTIS, we aim to advance the methodological approach in scoping reviews of educational barriers, offering a more nuanced and data-driven understanding of

the challenges faced by faculty in delivering IPE. This innovative analytical approach not only strengthens the findings of our review but also contributes to the broader field by demonstrating the applicability of advanced topic-modeling techniques in educational research. The insights gained through this method will provide valuable guidance for developing targeted interventions to overcome the identified barriers and support the effective implementation of IPE in higher education institutions.

Quality assessment

In the context of this scoping review, the quality assessment will adhere to the guidelines and principles outlined by the JBI and the PRISMA-ScR framework [11,19]. It is important to note that conducting a formal quality assessment or critical appraisal is not a mandatory component of scoping reviews, as their primary aim is to map the existing literature on a given topic, identifying key concepts, types of evidence, and gaps in research, irrespective of the methodological quality of the evidence [11,12].

Given the exploratory nature of scoping reviews, the inclusion of a quality assessment phase depends significantly on the specific objectives of the review and the nature of the research questions being addressed. For this scoping review, we anticipate a wide diversity of study designs and methodologies, ranging from empirical research to theoretical papers, opinion pieces, and grey literature. This heterogeneity presents considerable challenges in applying a uniform quality assessment tool or criteria across all included studies. Therefore, while acknowledging the potential value of assessing the methodological rigor and quality of the included sources, we have decided not to perform a formal quality assessment for this review. This decision aligns with our primary objective: to comprehensively map the literature on barriers perceived by university faculty in implementing IPE rather than to evaluate the quality of evidence or establish causal relationships as in systematic reviews or meta-analyses. However, we will extract and report methodological details provided in the included studies, such as study design, sample characteristics, data collection methods, and analysis techniques. This information will enhance the transparency of our review and allow readers to contextualize the findings and consider potential limitations inherent in the included studies. Any decisions regarding the inclusion or exclusion of studies based on methodological considerations will be documented and justified in the final scoping review report to ensure transparency and adherence to the highest standards of research integrity.

Protocol validation

The anticipated results of this scoping review are expected to provide a comprehensive overview of the current research state on the barriers university faculty perceived in implementing IPE. Through rigorous synthesis and mapping of the literature, the review is likely to highlight the various types of barriers and their underlying causes, revealing how these obstacles hinder faculty objectives related to IPE. The review should identify predominant themes and trends within the scope of faculty-perceived barriers, including detailed insights into personal, interpersonal, institutional, and systemic factors contributing to these challenges. Additionally, it will explore how these barriers and potential solutions vary across different geographical and cultural contexts.

Notably, utilizing the Optimizing and Comparing Topic Models Is Simple (OCTIS) framework to analyze the textual corpus is anticipated to uncover subtle, hidden patterns and emergent topics within the literature [18]. This innovative analytical approach enriches the narrative synthesis and adds a layer of quantitative rigor, offering a comprehensive view of the landscape of barriers to IPE implementation as perceived by faculty members. The primary advantage of using OCTIS lies in its integration of Bayesian Optimization, which optimizes the hyperparameters of topic models to enhance their performance specifically for our dataset. OCTIS ensures that the topic models generate more coherent and relevant topics, providing clearer insights into the underlying themes of the data by determining the optimal configuration of these parameters. This approach is expected to identify meaningful and interpretable topics that align with our research questions.

Limitations

While this scoping review aims to provide a comprehensive overview of the barriers perceived by university faculty in implementing IPE, several limitations must be acknowledged. The heterogeneity of study designs and methodologies anticipated in the included literature presents a challenge for data synthesis. The wide range of publication types—from empirical studies to opinion pieces and grey literature—may limit the ability to directly compare findings or draw generalized conclusions. This diversity might also complicate the identification of consistent themes and impede the development of a cohesive narrative synthesis. Additionally, the innovative use of the OCTIS framework, while offering advanced analytical capabilities, introduces certain limitations inherent to topic modeling techniques. The effectiveness of OCTIS relies heavily on the quality and consistency of the extracted textual data. Variations in reporting styles, terminologies, and levels of detail across studies may affect the model's ability to accurately identify and interpret underlying themes. Furthermore, topic models may oversimplify complex concepts, potentially overlooking nuanced insights or contextual factors crucial to understanding the barriers faced by faculty. There is also the possibility that the advanced computational methods used may not fully capture the cultural and contextual subtleties present in the literature, particularly when analyzing studies from diverse geographical regions. This limitation may affect the generalizability of the findings across different contexts and may not adequately reflect region-specific barriers or facilitators of IPE implementation. Moreover, despite plans to include grey literature if the initial search yields limited studies, there remains a risk of publication bias. Unpublished studies or reports with non-significant findings may not be easily accessible, potentially skewing the review towards literature that highlights more prominent or recognized barriers. Finally, the dynamic nature of IPE and its implementation across educational institutions means that new developments or emerging barriers may not be captured if they are not yet reflected in the published literature. This

temporal limitation suggests that the review's findings represent a snapshot based on available studies up to the final search and may not account for the most recent changes or innovations in the field.

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Declaration of competing interest

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CRediT authorship contribution statement

Viktorija Xharra: Conceptualization, Methodology, Data curation, Writing – original draft, Visualization. **Rosario Caruso:** Conceptualization, Methodology, Formal analysis, Supervision, Writing – review & editing. **Arianna Magon:** Methodology, Data curation, Formal analysis, Writing – review & editing. **Sara Carrodano:** Data curation, Validation, Writing – review & editing. **Gianluca Conte:** Resources, Software, Visualization. **Alessandro Stievano:** Supervision, Project administration, Writing – review & editing.

Data availability

No data was used for the research described in the article.

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