

Review

Medical Student Experience with Interpreter Services in a Simulated Environment: A Scoping Review

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Abstract

The use of interpreter services is an important component of medical care. It is critical for medical students to practice this during training. It is known that simulation and role play provide important opportunities for students to practice skills. This scoping review maps the experience that medical students around the world have practicing with interpreter services in a simulated environment. We searched within three major databases (PubMed, ERIC, and SCOPUS) using a wide range of search terms for publications from the past 15 years. This scoping review was conducted according to PRISMA-ScR guidelines. Of the 1341 studies initially obtained from search terms, 22 were ultimately found to meet inclusion criteria. There is variability in curricula offered including when in medical school, what other specialties are involved, and how the education is conveyed. Most publications lacked longitudinal follow-up and assessment of learner competence was limited. Review articles, a prevalence study, and proof of concept studies also serve to demonstrate the breadth of publications on this subject. This is an area of important consideration within medical education today. Many studies highlight the relative scarcity of formal programs as well as a lack of consistency. Where programs do exist, the importance of including simulation is highlighted.

Keywords: interpreter services; medical students; simulation; role play; language discordance; curriculum development; health equity

1. Introduction

Language discordance is an increasingly common issue in countries around the world and likely affects the provision of medical care. It has been shown that patients with limited English proficiency in the US face barriers including lower rates of access to care and poorer quality of care [1,2]. The use of professional interpreters or bilingual health providers has been shown to improve care and patient satisfaction [1,2] and is legally required in the US [3]. Despite this, correct and consistent use of interpreter services by medical staff has been shown to be low even in the setting of knowledge regarding its importance [4]. Health professions curricula have evolved to meet demands of excellent care across all domains including cultural competency. There have been publications around the world recognizing the importance of cultural, linguistic, and other contextual communications issues in healthcare education [5]. It is vital to identify whether medical students globally are being taught and experiencing interpreter service use in a meaningful way while in training.



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Simulation and role play is increasingly prevalent in medical education—giving learners the opportunity to practice skills in a realistic yet low-stakes environment as an initial experience. This has been used across many areas of medical education with good effect though some potential barriers to simulation training include cost, accessibility, and training [6,7]. Though simulation is widely used to teach a variety of skills and communication techniques in medical school, its integration with interpreter use training remains under-explored. No prior review has mapped how interpreter use is taught specifically through simulation or role play in medical school settings.

This review aims to map the current state of experiences with interpreter services that medical students have in a simulated environment. It is known that clinical experiences differ from those in simulation settings and this context may provide a unique opportunity to learn, practice, and use these skills. By identifying and characterizing published studies describing medical student engagement with interpreter services in a simulated or role play setting, we will be better able to describe best practices and to identify gaps and potential areas for future study. This is an underexplored area of medical education literature and will provide an important perspective on how medical students learn about and experience interpreter services in this way. It is likely that this review article will be important in reminding us about the necessity of including discrete education on interpreter services, inspiring institutions on ways in which this can be implemented, and motivating future research and consideration on this topic. This area of investigation is particularly appropriate for a scoping review given the broad scope of the question and a desire to include a variety of sources likely including emerging technologies and an overall purpose to map the existing evidence.

2. Materials and Methods

2.1. Protocol and Review Design

We initially published as a protocol within Deep Blue (can be accessed at <https://dx.doi.org/10.7302/23703>, accessed on 7 January 2025) though subsequent edits to the methodology were made secondary to altered authorship and goals. Specifically, the inclusion criteria qualifications for medical students and simulation were added. For transparency, this is outlined below in Table 1 and importantly, all changes were made prior to data extraction.

Table 1. Protocol key points and modifications.

Protocol Item and Modifications	
-	Objective: narrowed to include only a focus on medical students and simulation/role play rather than the more general experience with interpreter services that learners of all health professions have.
-	Review type: unchanged.
-	Inclusion and exclusion criteria: narrowed to include only medical students and simulation/role play.
-	Search strategy: unchanged.
-	Evidence selection: unchanged steps though with author C.D. taking the place of A.S. for review in the title/abstract phase and full-text phase, and title/abstract disagreements decided by A.S. in the title/abstract phase and joint consensus between H.W. and C.D. in full-text phase.
-	Data extraction: unchanged steps though with author C.D. taking the place of A.S. and with planned iterative modification of the data extraction table.

2.2. Search Strategy and Information Sources

We collaborated with a professional medical librarian to craft an appropriate search strategy. Terms were identified using a combination of keywords and index terms about learners, language discordance, and interpreter use. The complete strategy is listed in Appendix A.

We searched PubMed, ERIC, and SCOPUS for studies that described any interaction with learners and interpreter services. The search was completed in August 2024. Studies from the past 15 years (2009–2024) were included, given emerging technologies and a desire to ascertain the current status of students and interpreter use. Duplicates were automatically removed. The reference lists of sources were also queried to ensure all articles potentially meeting inclusion criteria were included.

2.3. Eligibility Criteria

Medical students, specifically, as a learner type, were the focus and simulation or role play was further specified as described above and based on the authors’ interests. All the literature that explored the experience that medical students have using or learning about interpreter services in a simulated environment were included. Inclusion and Exclusion Criteria are listed in Table 2. Studies were imported into Covidence for screening and review.

Table 2. Inclusion and exclusion criteria.

Inclusion Criteria		Exclusion Criteria	
-	Medical students	-	Does not include medical students
-	Interpreter service use	-	Does not include interpreter use
-	Simulation or role play	-	Does not include simulation or role play
-	Published in 2009 or after	-	Published prior to 2009
-	English language full-text available	-	Full text not available in English
		-	Thematically falls outside intended scope

2.4. Study Selection and Screening Process

Each study was reviewed independently by two reviewers (H.W. and C.D.) with disagreements decided upon by a third reviewer (A.S.) in the title and abstract phase and then by discussion and joint consensus by H.W. and C.D. in the full-text phase. We included studies available in English from any country or program as long as the full-text was available. We included a variety of types of publications. Sources were ultimately included if they met the inclusion criteria and pertained to the concept identified. Papers were excluded if they only mentioned that interpreters were used and there was another context as the focus of the paper and details about the experience of the student were unclear or not discussed. Studies were also excluded if medical students were only incidentally involved and the focus was on healthcare providers with students included with residents and attendings felt to be the focus. We did include articles that had all student types as long as medical students were clearly identified. There were several recurrent themes that were excluded including papers about the Reporter Interpreter Manager Educator (RIME) tool, translator or interpreter students only, evaluation of translated documents or materials for student use only, students learning English for a specific purpose (ESP) or medical English or another language for medical use, and medical students learning to serve as interpreters—all of these concepts were felt to fall outside the scope of this review.

A total of 1341 records were imported. After removal of 785 duplicates, 556 unique records remained. All 556 records underwent title and abstract screening, during which

374 records were excluded as irrelevant; reasons for exclusion at this preliminary stage were not recorded, consistent with PRISMA recommendations for the screening phase.

The remaining 182 articles were retrieved for full-text review. Of these, 160 were excluded for not meeting one or more inclusion criteria. Reasons for exclusion included not being about experience using or learning about interpreter services ($n = 52$), being a proposal or call to action only ($n = 7$), focusing on teaching non-native language skills rather than interpreter use ($n = 25$), describing medical students acting as interpreters ($n = 9$), lacking a simulation or role-play component ($n = 24$), not involving students ($n = 10$), or falling into mixed/other categories outside the scope of the review ($n = 33$). This mixed/other category primarily included articles that pertained to two or more of the noted categories.

Twenty-two studies met all inclusion criteria and were included in the final synthesis. See Figure 1 for additional details on the inclusion of articles.

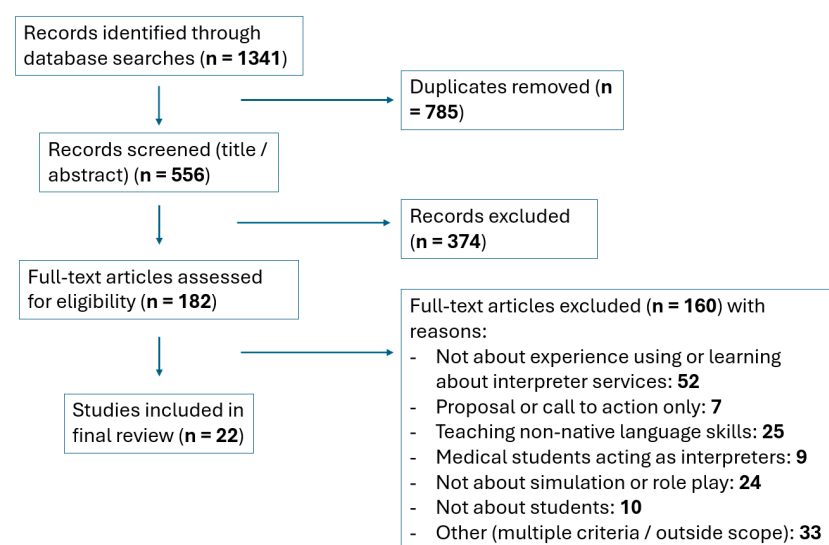


Figure 1. Flowchart of articles identified for inclusion.

2.5. Data Extraction and Synthesis

Data extraction was performed by two of the authors with H.W. performing data extraction and C.D. confirming applicable information collected and providing updates as needed. Data extracted included the country of study, the aim of the publication, the type of publication, the type of medical student, any other student demographics or inclusion, language(s) of patients, total number of participants, type of intervention or experience if applicable, interpreter type/experience, key findings or conclusion, limitations discussed, and proposals for the future. Data were summarized as applicable by H.W. and confirmed by C.D. as accurate—for example, describing the intervention type. All data were collected and maintained on Covidence.

2.6. Methodological Considerations and Reproducibility

Limitations were considered in the methodology including the criteria for English-only publications and the 15-year window that may have affected the type and breadth of articles selected. The English-only criteria is for feasibility given the authors limitations and the year criteria is both to narrow the scope to recent publications and to focus on the current context. Additionally, it is clear that there were alterations to the published protocol due to a change in authorship and goals and priorities of the project though ultimately this is not felt to influence the final product.

To enhance clarity and reproducibility, the key methodological steps of this scoping review are summarized in Table 3. The procedures described provide sufficient detail to allow replication of the search, screening, and data extraction processes by other researchers.

Table 3. Summary of scoping review methodology.

Step	Methodological Element	Description
1	Review Design	Scoping review conducted in accordance with PRISMA-ScR guidelines
2	Protocol	Protocol published in Deep Blue; modifications made prior to data extraction
3	Databases Searched	PubMed, ERIC, SCOPUS
4	Search Timeframe	2009–2024
5	Eligibility Criteria	Medical students, interpreter use, simulation or role play, English-language full text
6	Screening Process	Dual independent screening using Covidence; disagreements resolved by third reviewer
7	Full-text review	Independent review with consensus resolution
8	Data Extraction	Structured extraction by one author with verification by second author
9	Synthesis Approach	Descriptive and narrative synthesis
10	Reproducibility Measures	Transparent protocol reporting, explicit eligibility criteria, structured review workflow

3. Results

A total of 22 articles were included in the review with most originating from the US and featuring Spanish as the most common patient language. All studies involved medical students as part of the inclusion criteria though several also included other types of students such as interpretation, pharmacy, and other health professions. All included articles featured role play or simulation as part of the inclusion criteria but how this was conducted varied. Some publications focused on technology-based tools. A need for broader integration and the varied approach to inclusion of interpreter education was highlighted in other sources. In more closely examining the articles, several interesting findings and themes arose.

3.1. Geography and Language

22 Articles were ultimately selected for inclusion. Of the 22 articles, two are review articles which will be discussed specifically later. Of the remaining 20 articles, 12 are from the US, 3 from Germany, 2 from the UK, 2 from Australia, and 1 from Belgium. The global gaps can be seen on the world map, Figure 2. The most common language spoken by the patient or simulated patient was Spanish though there was a wide variety primarily based on languages encountered at the researcher's facilities.

3.2. Type of Student

As a medical student is part of the inclusion criteria, all studies included medical students or student doctors. However, three studies discretely included interpreting students as additional learners in the experience and one study included pharmacy students as well, and one study included a variety of health professions students such as dietetics, health law, medicine, pharmacy, physical therapy, public health, and social work. One

study included a diverse mix of healthcare workers including medical students in addition to residents, faculty, and other staff. The medical student type in each article varied as some included preclinical students and others included clinical students at varying levels and on varying experiences or clerkships.

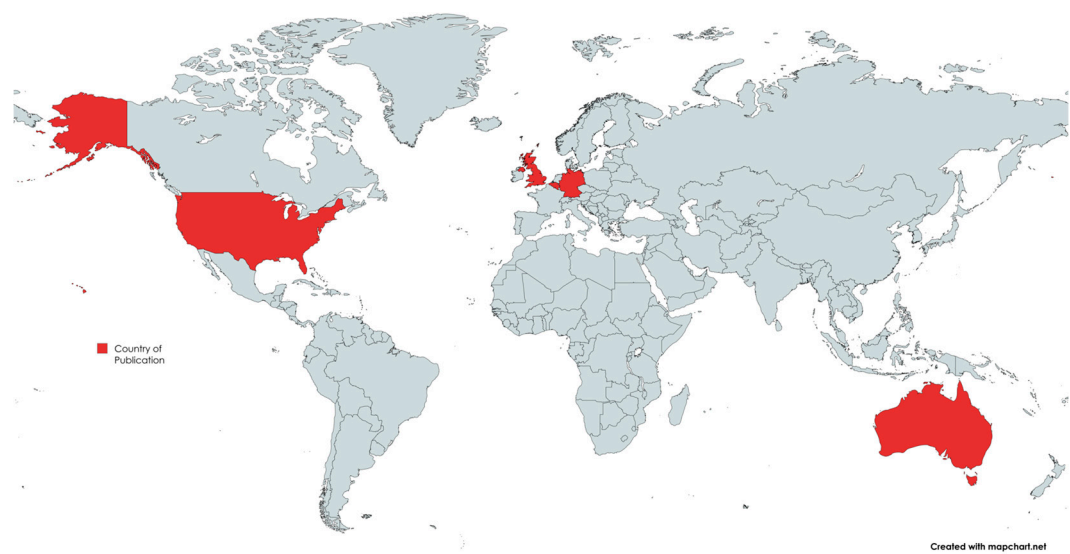


Figure 2. Countries of origin of included sources.

3.3. Type of Experience

The type of experience students had with interpreter services varied; however, all included papers discussed some sort of role play or simulation experience. Table 4 details the article and type of experience and findings each facility reported.

Table 4. Summary table—type of experience.

Author, Year	Country	Learner Type	Simulation/Role Play Type	Interpreter Type	Evaluation Method	Key Findings
Thomas, 2024 [8]	United States	First- and second-year medical students	Workshop with didactic led by second-year medical students followed by practical session with standardized patients	Bilingual students as interpreters, in-person	Pre- and post-survey	Improved knowledge of best practices as well as comfort/confidence; peer-assisted training may be effective tool
Friedman-Rhodes, 2010 [9]	Australia	First-year medical students	Didactic followed by role play of different scenarios with students and authors	Authors as interpreters, in-person	Pre- and post-survey	Improved attitude and knowledge about interpreters/interpretation though low participation/response rate
Hlavac, 2021 [10]	Australia	Medical and interpreting students	Didactic followed by role play in which interpreter students served as patients	Interpreting students as interpreters, in-person	Post-intervention questionnaire	High perceived usefulness of role play and improved knowledge; interprofessional education may be good tool

Table 4. Cont.

Author, Year	Country	Learner Type	Simulation/Role Play Type	Interpreter Type	Evaluation Method	Key Findings
Griswold, 2021 [11]	United States	Students from medicine, dietetics, health law, pharmacy, physical therapy, public health, and social work	Flipped classroom with students preparing ahead of time followed by discussion session and then small groups with observed interpreted encounters; used patient participants from locally resettled refugee communities	Professional interpreter, in-person	Three rating scales during encounter to assess abilities (Faculty Observer Rating Scale FORS, Interpreter Scale IS, Interpreter Impact Rating Scale IIRS), post-curriculum survey, and post-curriculum debrief	High ratings of trainee effectiveness, high level of agreement with student impression of self-improvement and knowledge. Flipped classroom and interprofessional strategies may be good tools
Fung, 2010 [12]	United States	Second-year medical students	Workshop including discussion, demonstration, and practice with students conducting interviews while observed; actors playing SP	Actor playing interpreter, in-person	OSCE after workshop to assess student competency	A total 39.4% failure rate with two problematic skills, may be related to under emphasis of key learning objectives during workshop, curricular changes planned
Krystallidou, 2018 [13]	Belgium	Third- and fourth-year medical students and master's level interpreting students	Plenary lecture followed by small group sessions with practice, role play, and feedback—interpreter students as patients	Interpreting students as interpreters, in-person	Formative assessment during encounters, summative assessment in the form of self-efficacy questionnaires in retrospect before and after the session, and trainer debriefing sessions	Collaborative education and practice may be a good tool particularly to stimulate insight and reflection
Bereknyei, 2010 [14]	United States	Medical students	Linguistic competency curriculum—a longitudinal experience including didactics, two role-play interpreter sessions in preclinical years, clerkship SP encounter, and two exams including interpreted SP encounters; used trained SPs	Standardized interpreters acting in different in-person roles: ad hoc untrained, family, and trained	Pre- and post-module knowledge testing in first year that was repeated in fourth year, skills assessed via OSCE exam at end of first year and again in fourth year—used Interpreter Impact Rating Scale (IIRS), faculty observer rating scale (FORS), and Interpreter Scale (IS)	Knowledge improvement after completing module with sustained knowledge in fourth year, skills also good or very good with no decrement with time

Table 4. Cont.

Author, Year	Country	Learner Type	Simulation/Role Play Type	Interpreter Type	Evaluation Method	Key Findings
Krampe, 2022 [15]	Germany	Medical students in final year of training and nursing students	Interpret2Improve—an educational intervention in which medical and nursing students learn together, introduction followed by practice in an interprofessional team with SPs	Professional interpreter, in-person	Post-course evaluation	Increase in perceived knowledge and skills, interprofessional activity may be good tool
Strelow, 2021 [16]	Germany	Medical students in 7th to 9th semester, pharmacy, and translation students	PinKo (patient interviews in interprofessional and intercultural contexts) program—didactic followed by practice using scripted roles; interpreting students as patients	Interpreting students as interpreters, in-person	Pre- and post-course surveys	Improved communication and collaboration; overall very satisfied though slightly lower for pharmacy students
Bansal, 2014 [17]	UK	Medical students in final primary care attachment	Small groups role-play consultations; actors as patients	Professional interpreters, in-person	Student questionnaire and GP tutor feedback	Students more confident; tutors supportive of the program
Escott, 2009 [18]	UK	Medical students on primary care placement	Discussion followed by bilingual SP patient scenarios	Various interpreter types—family member, formal interpreter, telephone interpreting service; not otherwise specified	Post-course evaluation, focus group with SPs, and workshop organizer feedback	Feedback positive including role of bilingual SP practice
McEvoy, 2009 [19]	United States	Third-year medical students	“Cross-Cultural Communication—three years of iterative changes to this program—using an Interpreter” a didactic and discussion section with experiential learning added in year 2, moved to the beginning of year 3	Medical Spanish teachers as untrained interpreters, in-person	Retrospective pre- and post-survey 7 weeks after session to measure perceived efficacy in the final year of the program	Most students with improved sense of preparedness; they appreciated the opportunities to practice

Table 4. Cont.

Author, Year	Country	Learner Type	Simulation/Role Play Type	Interpreter Type	Evaluation Method	Key Findings
Jacobs, 2010 [20]	United States	Second-year medical students	Trigger video of inappropriate use followed by didactic followed by modeling session followed by role-playing session with interpreters playing patients.	Not specified, in-person	Pre- and post-evaluation and questionnaire	Improved knowledge, attitude, and reported likelihood of future behaviors, with role playing highlighted as best component
Lie, 2010 [21]	United States	Second- to third-year medical students	Didactic, standardized clinical station as part of clinical practice exam at end of years 2 and 3	Not specified, in-person	Evaluations during exam, self-assessment of students	Communication skills remained excellent over one year of training though some skills worsened including “managing the encounter”, and students overrated their skills compared with trained observers
Guizado de Nathan, 2023 [22]	United States	First-year medical students	Simulation of telehealth encounter with SP patient	Simulated medical interpreter, telehealth	Feedback on course evaluations of the first year of use of curriculum followed by post-curriculum survey the next year	Comments positive, students appreciated opportunity to practice, comments allowed for refinements to curriculum over time
Jones, 2020 [23]	United States	Healthcare workers including students	Didactic followed by discussion followed by role play	In-person, video, and phone interpretation	Post-curriculum survey	Most participants agreed workshop is valuable, met objectives, and is helpful

One approach used peer-assisted learning as a novel technique [8]. Two discussed the importance of joint training for interpreting students and medical students together [10,13]. Others included various interprofessional learning experiences including medical and nursing students together [15], students from dietetics/health law/medicine/pharmacy/physical therapy/public health/social work together [11], and medicine/pharmacy/translation students together [16].

The type of interpreter also varied in the simulation or role setting including use of professional interpreters in some studies while other studies used interpreting students, actors, medical Spanish teachers, students, and instructors.

3.4. Educational Outcomes

Of the 22 included studies, 16 were descriptions and dissemination of specific curricula. Of these 16 studies, all sought to evaluate the program in some way with the majority, 87% (14 studies), using surveys. The most commonly used technique was found to be a post-curriculum survey only with 8 studies using this followed by pre- and post-curriculum

surveys with 4 studies and 2 studies using retrospective pre- and post-surveys. One study used pre- and post-knowledge testing. Three studies used exams to demonstrate skills.

3.5. Innovations and Assessment Instruments

Two articles, specifically, were in reference to medical student experience using technology-based interpretation and highlighted not only the breadth of experiences students may have but also the potential for future expansion of interpreter services. One study sought to examine the interpreted sessions themselves and found a similar level of satisfaction when students used technology-based interpretation as with human services [24]. This was a study examining the satisfaction of patients and students when using in-person interpretation, telephone interpretation, video interpretation, or no interpretation and found that patient satisfaction was high across all conditions but particularly with use of telephone interpreter [24]. Students felt that in-person interpretation was the most highly effective though findings were not statistically significant [24].

The other technology-specific article evaluated the use of a novel speech-to-speech language translation app and found some benefits and potential areas for use such as in emergency situations or brief conversations; however, in its current state, there is limited accuracy and challenges exist in practical use [25].

One publication sought to validate a novel Interpreter Scale based on expert consensus and prior studies and when comparing to two validated scales [26]. This scale is a measuring tool that interpreters can use to assess the communication skills of learners and was used during medical student simulated encounters after an instruction session with good consistency and reliability and may be an incredibly useful component in the development of curricula including simulation for other programs [26].

The innovations and assessment instrument sources are summarized in Table 5.

Table 5. Summary table—innovations and assessment instruments.

Author/Year	Country	Learner Type	Simulation/Role Play Type	Evaluation Method	Key Findings
McLaughlin, 2013 [24]	United States	Third- and fourth-year medical students	Students as providers during SP encounters; purpose of allowing researchers to evaluate interpreted sessions and satisfaction of patients and students	Post-encounter survey	Technology-based methods of interpretation provided similar levels of satisfaction when compared with human services
Hermann-Werner, 2021 [25]	Germany	Second-year preclinical medical students	Students as providers during SP encounters using a language translation app to allow for evaluation of app use	Post-encounter survey	Critical comments about accuracy and technical challenges; may be helpful in emergency situations or brief conversations
Lie, 2009 [26]	United States	First- and second-year preclinical medical students	Students as providers during SP encounters	Use of two validated scales: Patient Physician Interaction Scale (PPI) by the SP and Interpreter Impact Rating Scale (IIRS) by the SP as well as the novel Interpreter Scale (IS) by the standardized interpreter	The novel Interpreter Scale (IS) has reasonable internal consistency and validity to warrant use for formatively measuring student communication skills in interpreted SP encounters

3.6. Published Reviews

One recently published prevalence study looked via surveys if and how medical schools include curricula on how to work with interpreters and patients with limited English proficiency in the US. The results showed a low (26%) response rate (38 schools out of 147) with most (76%) of responding schools offering a curriculum and 34% providing an SP experience [27]. The format of curricula included varies, with some schools practicing one-on-one and others in a group [27]. Of the responders who do include curricula, 62% have been administering this for less than 10 years [27]. A total of 59% of schools are evaluating these sessions while 41% do not have formal evaluation of this area of instruction [27]. Schools not offering this type of instruction were queried and some reported not believing it is needed, having it available as an optional item, and with time constraints as a major barrier to inclusion [27]. Some schools “did not see a need” for this instruction and reported reasons for this of having a student population with a large portion as bilingual or a sense that this training is better suited for residency [27].

The two published review articles that met criteria for inclusion discuss the relative lack of interpreter service education and a need to incorporate this into medical school curricula [28,29]. One narrative aimed to investigate the clinical experience of students and included simulated environments in “developing students’ skills through training in how to use interpreters in health care interviews or consultations” [29]. There is a wide variety in types of trainings but most reported training types show improvement in skills, attitudes, patient care, and confidence [29]. There is a relative scarcity of publications on teaching of interpreter use in medical education and the authors identified this as an area of research gap [29].

One review identified that in published articles, there is a wide variety of established programs to teach about interpreter services and most (63%) of reported programs included use of interpreters in the development or delivery of the program [28]. This systematic review discussed all identified types of programs and concluded that programs that use interpreters in the development and implementation of the learning, hands-on practice, and both in-person and virtual content are ideal [28].

The review articles are summarized in Table 6.

Table 6. Summary table—reviews.

Author/Year	Country	Learner Type	Simulation/Role Play Type	Evaluation Method	Key Findings
Himmelstein, 2018 [27]	United States	Medical Schools	A total of 76% of responders offer a curriculum on working with interpreters with 34% providing didactic and SP experiences	Survey sent to medical schools	Low response rate (26%); most responders with curricula have been administering for less than 10 years and format varies; responders without curricula cited various barriers and reasons for this absence
Constantinou, 2021 [29]	International	Medical and health professionals’ schools		Narrative review, interpretive approach to article findings and synthesis	Authors propose a framework for integrating working with interpreters into education, existing training has been shown to improve knowledge and skills though research gap persists
Fukui, 2024 [28]	United States and Australia	Medical students, residents, PA students, oral health professions students, other healthcare clinicians		Systematic review	Concluded that the ideal program to train learners on interpreter use involves interpreters in creation/implementation/assessment steps, includes hands-on practice, and blends digital and in-person content

4. Discussion

This scoping review demonstrates that medical student education on working with interpreters in simulated or role-play environments is growing but remains inconsistent in scope, structure, and assessment. Across the 22 included papers, learner experiences varied widely by geography, curricular design, degree of interprofessional integration, and type of interpreter used. Most published interventions report positive outcomes such as improved knowledge, confidence, communication skills, and preparedness for caring for patients with language discordance and interpreter use. There continues to be wide variability in the type of curriculum and a lack of standardized assessment or rigorous evaluation.

Most studies used surveys to show improved outcomes and it is important to acknowledge the potential for bias in this type of self-reported data. Skills assessments with structured standardized patient examinations was another less commonly described way to evaluate the program. This type of data likely requires more time and resources to obtain but is unbiased and more reflective of the application of knowledge and skills obtained during training. It may be important for future study of this subject to evaluate not just the learner's knowledge and comfort but also the simulated or real-world use of these skills and change in behavior to be most helpful and contributory to the existing literature.

Interpreter use training appears to be effective when hands-on skills are practiced, the curriculum is deliberately structured, and the experience is supported by trained interpreters. Interprofessional education with other students or members of the healthcare field has also been consistently described as valuable in bringing collaboration, insight, and improved communication. Technology-based simulations including telehealth encounters and translation-app interactions highlight emerging modalities that offer promise but also reflect current technical and accuracy limitations. Regarding technological advances and implementation, it will also be important with future research projects to monitor and include such innovations as artificial intelligence interpretation which was not collected in this article due to the 2024 cut-off and will likely emerge with future publications. This is clearly an evolving landscape of interpreter use and interpreter-related training and there is a need for curricula that reflect real-world practice.

Despite the growth of programs, interpreter-focused simulation remains unevenly implemented. Survey evidence suggests many medical schools either do not provide such training or deliver it without formal evaluation. Among institutions that do offer instruction, content varies substantially. The relative scarcity of published curricula and the limited number of validated assessment instruments indicate an important gap between recognized educational need and the breadth of available evidence.

Overall, the literature supports the value of simulation and role play for teaching medical students how to effectively work with interpreters yet also reveals substantial opportunities for improvement. Future work should prioritize integrating interpreter training across the medical school continuum, involving professional interpreters and interpreting students in curriculum design and delivery, expanding and validating assessment tools, and exploring scalable, technology-enhanced approaches that maintain fidelity to real clinical communication. Addressing these gaps will better prepare future physicians to care for diverse patient populations.

5. Conclusions

This scoping review highlights growing recognition of the importance of interpreter-use training for medical students while also noting the substantial heterogeneity in curricular design, implementation, and evaluation. Existing evidence suggests that structured, hands-on, and interprofessional simulation experiences are effective at improving learner knowledge, comfort, and confidence, though most outcomes rely on self-reported survey

data. The limited use of standardized, objective assessments and the variability in curricular approaches reveal a persistent gap between educational need and available evidence. Future research should focus on developing longitudinal and rigorously evaluated curricula that reflect evolving technologies and real-world clinical communication to better prepare medical students to care for linguistically diverse populations.

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Informed Consent Statement: Not applicable.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

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Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

This details the search strategy used for each of the databases used.

PubMed:

("Health professions education"[tw] OR "Health occupations education"[tw] OR "Health occupations student*"[tw] OR "Health occupations school*"[tw] OR "Health professions school*"[tw] OR "Students, Health Occupations"[mesh] OR "Schools, Health Occupations"[mesh] OR "Students, Medical"[Mesh] OR "Education, Medical, Undergraduate"[Mesh] OR "Schools, Medical"[Mesh] OR "medical education"[tiab] OR "medical student"[tw] OR "medical students"[tw] OR "medical school"[tw] OR "medical schools"[tw] OR "medical training"[tw] OR "student doctor*"[tw] OR "Education, Dental"[mesh] OR "dental education"[tw] OR "dental school*"[tw] OR "dental training"[tw] OR "dental student*"[tw] OR "Education, Nursing"[mesh] OR "nursing education"[tw] OR "nurse education"[tw] OR "nursing school*"[tw] OR "nurse training"[tw] OR "nursing training"[tw] OR "nursing student*"[tw] OR "student nurse*"[tw] OR "Education, Pharmacy"[mesh] OR "pharmacy education"[tw] OR "pharmacy school*"[tw] OR "school of pharmacy"[tw] OR "pharmacy training"[tw] OR "pharmacist training"[tw] OR "pharmacy student*"[tw] OR "Education, Public Health Professional"[mesh] OR "public health student"[tw] OR "student of public health"[tw] OR "school of public health"[tw] OR "Interprofessional Education"[mesh] OR "interprofessional education"[tw] OR "inter-professional education"[tw]) AND (interpreter*[tiab] OR translator*[tiab] OR "translating"[mesh] OR "Language interpret*"[tw] OR "medical interpret*"[tw] OR "Language equity"[tw] OR "Limited English proficiency"[tw] OR "Limited English language proficiency"[tw] OR "Language interpretation"[tw] OR "Interpretation service*"[tw] OR "non-English language"[tw] OR "Language skills"[tw] OR multilingual*[tw] OR Multilingualism[mesh])

Scopus:

(TITLE-ABS-KEY("Health professions education") OR TITLE-ABS-KEY("Health occupations education") OR TITLE-ABS-KEY("Health occupations student*") OR TITLE-ABS-KEY("Health occupations school*") OR TITLE-ABS-KEY("Health professions school*") OR INDEXTERMS("Students, Health Occupations") OR INDEXTERMS("Schools, Health Occupations") OR INDEXTERMS("Students, Medical") OR INDEXTERMS("Education, Medical, Undergraduate") OR INDEXTERMS("Schools, Medical") OR TITLE-ABS("medical

education") OR TITLE-ABS-KEY("medical student") OR TITLE-ABS-KEY("medical students") OR TITLE-ABS-KEY("medical school") OR TITLE-ABS-KEY("medical schools") OR TITLE-ABS-KEY("medical training") OR TITLE-ABS-KEY("student doctor*") OR INDEXTERMS("Education, Dental") OR TITLE-ABS-KEY("dental education") OR TITLE-ABS-KEY("dental school*") OR TITLE-ABS-KEY("dental training") OR TITLE-ABS-KEY("dental student*") OR INDEXTERMS("Education, Nursing") OR TITLE-ABS-KEY("nursing education") OR TITLE-ABS-KEY("nurse education") OR TITLE-ABS-KEY("nursing school*") OR TITLE-ABS-KEY("nurse training") OR TITLE-ABS-KEY("nursing training") OR TITLE-ABS-KEY("nursing student*") OR TITLE-ABS-KEY("student nurse*") OR INDEXTERMS("Education, Pharmacy") OR TITLE-ABS-KEY("pharmacy education") OR TITLE-ABS-KEY("pharmacy school*") OR TITLE-ABS-KEY("school of pharmacy") OR TITLE-ABS-KEY("pharmacy training") OR TITLE-ABS-KEY("pharmacist training") OR TITLE-ABS-KEY("pharmacy student*") OR INDEXTERMS("Education, Public Health Professional") OR TITLE-ABS-KEY("public health student") OR TITLE-ABS-KEY("student of public health") OR TITLE-ABS-KEY("school of public health") OR INDEXTERMS("Interprofessional Education") OR TITLE-ABS-KEY("interprofessional education") OR TITLE-ABS-KEY("interprofessional education")) AND (TITLE-ABS(interpreter*) OR TITLE-ABS(translator*) OR INDEXTERMS(translating) OR TITLE-ABS-KEY("Language interpret*") OR TITLE-ABS-KEY("medical interpret*") OR TITLE-ABS-KEY("Language equity") OR TITLE-ABS-KEY("Limited English proficiency") OR TITLE-ABS-KEY("Limited English language proficiency") OR TITLE-ABS-KEY("Language interpretation") OR TITLE-ABS-KEY("Interpretation service*") OR TITLE-ABS-KEY("non-English language") OR TITLE-ABS-KEY("Language skills") OR TITLE-ABS-KEY(multilingual*) OR INDEXTERMS(Multilingualism))

Eric:

("Health professions education" OR "Health occupations education" OR "Health occupations student*" OR "Health occupations school*" OR "Health professions school*" OR "Students, Health Occupations" OR "Schools, Health Occupations" OR "Students, Medical" OR "Education, Medical, Undergraduate" OR "Schools, Medical" OR "medical education" OR "medical student" OR "medical students" OR "medical school" OR "medical schools" OR "medical training" OR "student doctor*" OR "Education, Dental" OR "dental education" OR "dental school*" OR "dental training" OR "dental student*" OR "Education, Nursing" OR "nursing education" OR "nurse education" OR "nursing school*" OR "nurse training" OR "nursing training" OR "nursing student*" OR "student nurse*" OR "Education, Pharmacy" OR "pharmacy education" OR "pharmacy school*" OR "school of pharmacy" OR "pharmacy training" OR "pharmacist training" OR "pharmacy student*" OR "Education, Public Health Professional" OR "public health student" OR "student of public health" OR "school of public health" OR "Interprofessional Education" OR "interprofessional education" OR "inter-professional education") AND ("interpreter*" OR "translator*" OR "translating" OR "Language interpret*" OR "medical interpret*" OR "Language equity" OR "Limited English proficiency" OR "Limited English language proficiency" OR "Language interpretation" OR "Interpretation service*" OR "non-English language" OR "Language skills" OR "multilingual*" OR "Multilingualism")

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