

Educational Interventions to Improve the Empathy of Pharmacy Students Toward Geriatrics: A Systematic Review

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ABSTRACT

Empathy is defined as the ability to understand the feelings of others, thereby allowing them to feel understood. Empathy must be cultivated in the educational method to help pharmacy students to learn about patients, particularly the elderly. This systematic review mainly aimed to find, evaluate, and synthesize studies about educational interventions that improve the empathy of pharmacy students toward geriatrics. Three databases, namely, PubMed, Science Direct, and Google Scholar, were searched for articles that include educational intervention articles and focused on outcome measures related to improving the empathy (or its subdivision) toward geriatrics. The Medical Education Research Study Quality Instrument (MERSQI) was used to assess the possibility of bias. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used in this review. Of the nine included studies, eight studies have been designed with quasi-experimental pre-post-test measurement design. Four studies were conducted at the university in the United States, two in Malaysia, one in Australia, one in Brazil, and one in Singapore. Three studies used simulation and another three used direct interaction with the elderly, as an educational intervention. Eight studies reported a statistically significant increase in empathy toward geriatrics. Thus, the educational intervention could help pharmacy students to develop empathy for the elderly. The included studies are heterogeneous, thereby, implying that more research is needed to determine the most effective educational methods to improve empathy. Future studies should consider study outcomes such as transfer to practice and long-term changes in empathy.

Key words: empathy, attitude, simulation, educational intervention, pharmacy students

INTRODUCTION

Empathy is described as the ability to understand and articulate the feelings of others, thereby allowing them to feel understood (Carol Dulay *et al.*, 2018; Cunico *et al.*, 2012). Communication, positive talk, appropriate touch, eye contact, body posture, gestures, and the quality and quantity of the encounter are all indicators of empathic engagement in patient care that can lead

to increased patient satisfaction, better compliance, feelings of importance in patients, diagnosis accuracy, and prognosis accuracy. Additionally, empathy is a vital component of the pharmacist-patient relationship and is critical for pharmacists to develop relationships with patients to obtain the best treatment results and promote patient compliance (Williams *et al.*, 2014). Empathy must be possessed not only by pharmacists, but also by

pharmacy students who are aspiring to be pharmacists, because they have little experience with patients or disease-related issues (Lor *et al.*, 2015).

Many patients have reported that the healthcare professionals with whom they met lacked empathy, respect, and support and that they did not provide enough information. The literature has indicated that empathy for professionals decreases as the clinical practice of healthcare professionals expands (Ferri *et al.*, 2015; Nosek *et al.*, 2014). Only a few studies have looked at how empathic pharmacy students are. The Jefferson Scale of Empathy has been used in some research to investigate the potential differences in empathy levels among students from different health fields. Compared to nursing, dentistry, and medical students, pharmacy students had the lowest empathy scores when they started their first year of training, with minimal change in their empathy scores at the end of the first year (Nunes *et al.*, 2011; Wilson *et al.*, 2012).

Empathy and understanding are crucial characteristics that pharmacy students should have as the patient population grows older since attitudes might influence care quality as providers. Understanding the viewpoints of other people might be difficult, especially if one has not dealt with aging or disease-related incapacity. Pre-qualification courses are thought to be “off the mark”, and educational institutions are not adequately preparing students to enter the elderly care (Koskinen *et al.*, 2015). Incorporating curricular material relevant to aging and older people may assist pharmacy students to develop empathy and attitudes toward older people, as well as prepare them to work with them. Several techniques have been proposed to improve empathy among healthcare students. Students can play the roles of people in need of medical care, such as elderly people with age-related problems, to help them develop empathy (Moudatsou *et al.*, 2020).

Previous studies have reported communication skills training, experiential learning, and interprofessional educational interventions as successful ways to improve the empathy levels of medical students (Batt-Rawden *et al.*, 2013). However, the predominant focus on medical and nursing students limits previous reviews (Bearman *et al.*, 2015). The current study focuses on pharmacy students and the impact of educational interventions on empathy levels to

close this gap. This study aimed to find, evaluate, and synthesize research on educational interventions that improve the empathy of pharmacy students toward geriatrics.

METHODS

In the initial planning phase, we conducted a discussion between members consisting of 4 authors (HP, SAK, AWW, and YSP) to review the current theory about educational interventions to improve the empathy of pharmacy students. On October 5, 2021, we conducted a systematic review of educational interventions to improve the empathy of pharmacy students toward geriatrics. The latest search was on October 9, 2021. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used in this review (Page *et al.*, 2021).

Search Strategy

Initial searches were conducted using three electronic databases, namely, PubMed, Science Direct, and Google Scholar. A broad literature search was conducted to identify keywords in the field. The literature search uses the main term to expand the search. The key terms used for the search were as follows (Table I). A search of the PubMed database was conducted using Medical Subject Headings (MeSH). While keywords are adjusted based on results from other databases.

All English language articles that described educational interventions designed to cultivate the empathy of pharmacy students toward the elderly were independently selected and reviewed. We recommended techniques for systematic reviews, and all titles and abstracts were screened to ensure that they meet the eligibility criteria. Then we read the full text to determine its relevance. All articles were retrieved through Mendeley Reference Manager to remove duplicates.

Eligibility Criteria

This review focused only on pharmacy students (first - fourth year) as healthcare professionals candidates. Pharmacy students followed an educational intervention (university or organization) and focused on outcome measures related to improving empathy (or its subdivision) toward geriatrics. The subdivisions of empathy include attitude, behavior, and competency such as empathic skills, communication skills, and skills to build rapport (Derksen *et al.*, 2013).

Table I. Keywords used in each database.

No	Database	Keywords
1	PubMed	'empathy' AND 'pharmacy students' AND 'elderly OR older'
2	Science Direct	'empathy' AND 'intervention' AND 'pharmacy students' AND 'elderly OR older'
3	Google Scholar	'empathy' AND 'intervention' AND 'pharmacy students' AND 'elderly'

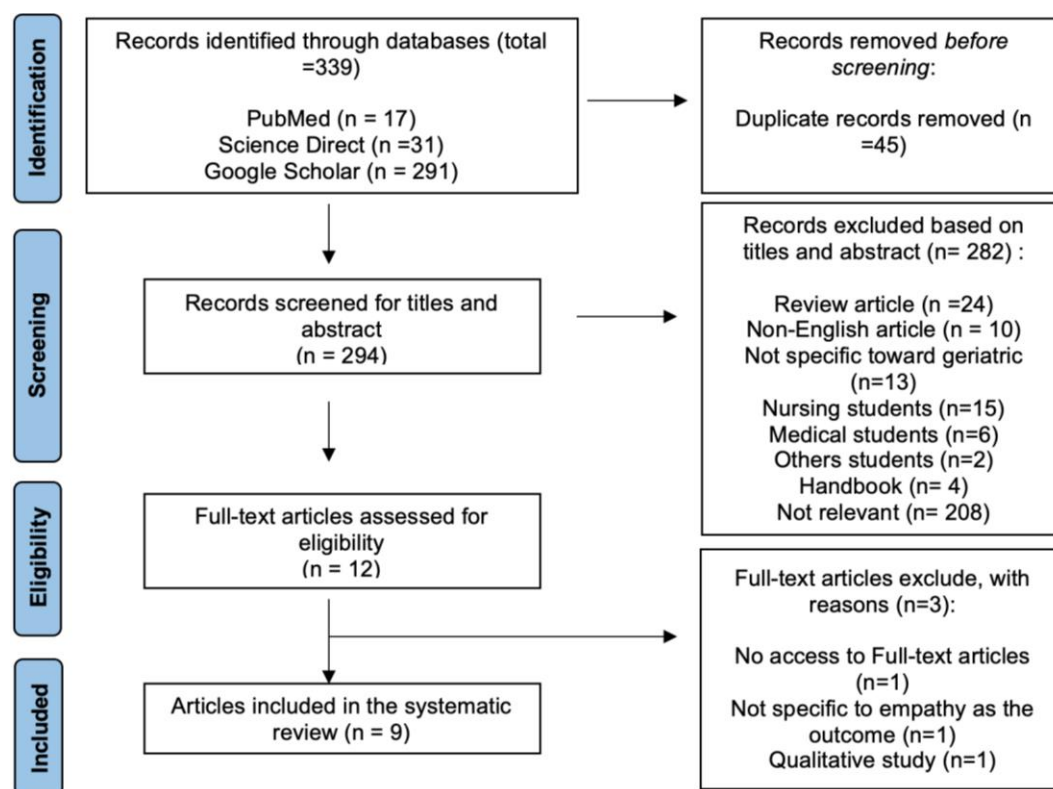


Figure 1. PRISMA diagram of this review

All studies should meet our inclusion and exclusion criteria. The inclusion criteria were articles that included the original article without a time limit, published in the English language, and with full text available via searched databases. Exclusion criteria were review articles, commentary articles, handbooks, or guidelines. The study design includes single-group cross-sectional or single-group post-test only, single-group pre-test and post-test, and a randomized controlled trial.

The Medical Education Research Study Quality Instrument (MERSQI) was used as a quality assessment tool to analyze the quality of all included studies with the standard scores of 5-18 (Smith & Learman, 2017). Data were independently extracted by researchers (HP, SAK,

AWW, and YSP), and any disagreement between the reviewers were resolved through discussion.

RESULTS AND DISCUSSION

Study Selection

Our initial literature search generated 339 articles (PubMed with 17 articles, Science Direct with 31 articles, and Google Scholar with 291 articles). Figure 1 provides an overview of the selection process. After the removal of duplicate articles (294 articles), titles and abstracts were assessed to determine their relationship to this systematic review. Most of these articles did not meet the inclusion criteria. Only 12 articles were assessed for eligibility and full text review. Finally, the systematic review included 9 articles.

Table II. Results of the Quality Instrument for Medical Education Research Study of included studies

Domain	MERSQI Item	Score	Winkle <i>et al</i>	Chen <i>et al</i>	Boorman <i>et al</i>	Abeyaratne <i>et al</i>	Griffiths <i>et al</i>	Leedahl <i>et al</i>	Lee <i>et al</i>	Silva <i>et al</i>	Fong <i>et al</i>
Study Item	Single-group cross-sectional or single group posttest only	1									
	Single group pretest & posttest	1.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Nonrandomized, 2 groups	2									
	Randomized controlled trial	3							✓		
	Institutions studied:										
	1	0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
	2	1								✓	
	3	1.5									
	Response rate, %:										
	Not applicable	0.5									
	<50 or not reported	1	✓	✓	✓	✓	✓	✓	✓	✓	✓
	50-74	1.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
>75											
Assessment by participants		1									
Objective measurement		3	✓	✓	✓	✓	✓	✓	✓	✓	
Internal structure:											
Not applicable											
Not reported		0		✓				✓	✓	✓	
Reported		1	✓		✓	✓	✓	✓	✓	✓	
Content:											
Not applicable											
Not reported		0				✓	✓	✓	✓	✓	
MERSQI Item											
Reported		Score	Winkle <i>et al</i>	Chen <i>et al</i>	Boorman <i>et al</i>	Abeyaratne <i>et al</i>	Griffiths <i>et al</i>	Leedahl <i>et al</i>	Lee <i>et al</i>	Silva <i>et al</i>	Fong <i>et al</i>
Relationships to other variables:											
Not applicable		1	✓	✓	✓	✓	✓	✓	✓	✓	✓
Not reported		0	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reported		1									

Domain	MERSQI Item	Score	Winkle <i>et al</i>	Chen <i>et al</i>	Boarma <i>n et al</i>	Abeyaratne <i>et al</i>	Griffiths <i>et al</i>	LeeDahl <i>et al</i>	Lee <i>et al</i>	Silva <i>et al</i>	Fong <i>et al</i>
	Appropriateness of analysis:										
	Inappropriate for study design or type of data	0									
	Appropriate for study design, type of data	1	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Complexity of analysis:										
	Descriptive analysis only	1				✓		✓			
	Beyond descriptive analysis	2	✓	✓	✓		✓		✓		✓
	Satisfaction, attitudes, perceptions, opinions, general facts	1			✓		✓	✓	✓		✓
	Knowledge, skills	1.5	✓	✓						✓	
	Behaviors	2									
	Patient/health care outcome	3									
Overall Score			13	12	12	11	11.5	9.0	12	12.5	10.5

Table III. Study Interventions Characteristics

No	Educational Interventions	Studies
1	Simulation Based Intervention	Fong <i>et al.</i> , 2021; Lee & Teh, 2020
2	Education event (Direct interactions)	(Abeyaratne <i>et al.</i> , 2020; Boarman EA <i>et al.</i> , 2017; Leedahl <i>et al.</i> , 2020)
3	Virtual Patient for Geriatric Education	Silva <i>et al.</i> , 2021
4	Aging Game (Simulation based game)	Chen <i>et al.</i> , 2015a
5	Theatrical performance and discussion	van Winkle <i>et al.</i> , 2012
6	Watch Video and case study	Griffiths <i>et al.</i> , 2020

The MERSQI' scores ranged from 9.0 (50%) to 13 (72%) of a possible 18 points, with a mean of 11.5 (64 % on a scale of 100), for the nine included studies (Table II). This range was interpreted as substantial in quality because all the included studies have MERSQI scores of \geq 9.0 (Reed *et al.*, 2008).

Study Characteristics

We identified 9 studies that quantitatively assessed educational interventions related to empathy improvement in our specified population. Study publication dates ranged from 2012 to 2021. Four studies were conducted in the United States (Boarman *et al.*, 2017; Chen *et al.*, 2015a; Divine & Cain, 2009; Leedahl *et al.*, 2020; van Winkle *et al.*, 2012), two in Malaysia (Griffiths *et al.*, 2020; Lee and Teh, 2020), one in Singapore (Fong *et al.*, 2021), one in Australia (Abeyaratne *et al.*, 2020), and one in Brazil (Silva *et al.*, 2021). The number of respondents included in the studies ranged from 22 to 368 respondents.

Eight studies were designed with quasi-experimental pre-post-test measurements (Abeyaratne *et al.*, 2020; Boarman *et al.*, 2017; Chen *et al.*, 2015b; Fong *et al.*, 2021; Griffiths *et al.*, 2020; Leedahl *et al.*, 2020; Silva *et al.*, 2020; van Winkle *et al.*, 2012). Six studies (67%) reported sample sizes of 100 or more participants, while three studies (33%) indicated fewer than 100 participants (Boarman *et al.*, 2017; Griffiths *et al.*, 2020; Leedahl *et al.*, 2020). Six (67%) studies included pharmacy students as participants and three (33%) studies informed pharmacy students as a team with other health professional students (Griffiths *et al.*, 2020; Leedahl *et al.*, 2020; van Winkle *et al.*, 2012) (Table V).

Study Interventions

This review aimed to identify educational interventions that can be implemented in empathy improvement toward geriatrics. Three studies used

simulation through intervention or game, typically involving experiential learning in which study participants acted as a patient or pharmacists. Fong *et al.* (2021) explained that an Aging Simulation Workshop was designed to provide students with first-hand experience of performing medication management tasks as older adults with various physiological or pathological changes (Fong *et al.*, 2021). The workshop consisted of two segments: a 3h simulation and a 1h debrief. The simulation consisted of four stations as follows: (1) mobility, (2) vision, (3) touch, and (4) hearing. Students participated in the mobility station wearing ankle weights and knee restraints around both legs to simulate Parkinson disease and osteoarthritis, respectively. Then the students completed various tasks while wearing various goggles at the vision station and wearing earplugs to simulate hearing loss at the hearing station.

Three studies implemented an education event with direct interaction with the elderly, for example, the geriatric participants rotated through the following three designated stations: (1) Ask a pharmacist, (2) Education, and (3) Screening and interaction with pharmacy students (Boarman EA *et al.*, 2017). Another study stated that elderly and pharmacy students collaborate to help the elderly use technology, while students gain valuable leadership, teaching, and problem-solving skills (Leedahl *et al.*, 2020).

One study used Virtual Patient for Geriatric Software (VIPAGE), in which the students were divided into groups of four for each VIPAGE consultation. Students interacted with the virtual patient on desktop computers, typing their responses in the medical record fields (Silva *et al.*, 2021). Another study used a video presentation of a person with Alzheimer's disease and discussed their thoughts on this (Griffiths *et al.*, 2020)

Table IV. Description of outcome measures

Measured outcome	Instrument	Description	Item and Scoring	Cited papers
Empathy towards geriatrics	Jefferson Scale of Empathy – Health Professions Student (JSE-HPS)	Levels of self-evaluated empathy for older people.	The scale includes 20 items answered on a 7-point Likert scale (ranging from strongly agreeing 7 to strongly disagree 1).	(Chen <i>et al.</i> , 2015a; Fong <i>et al.</i> , 2021; SWH & PL, 2020; van Winkle <i>et al.</i> , 2012)
	Kiersma-Chen Empathy Scale (KCES)	Levels of cognitive and affective empathy levels for older people.	15 items, 7-point Likert-type, strongly disagree until strongly agree	(Chen <i>et al.</i> , 2015a)
	Geriatric Attitudes Scale (GAS)	Self-evaluated attitudes towards older people.	14-item questionnaire with a mix of positively and negatively worded questions, with responses graded on a five-point Likert scale ranging from strongly disagree to strongly agree, with a neutral response	(Boarman <i>et al.</i> , 2017; Silva <i>et al.</i> , 2020)
Attitudes towards geriatrics	Attitudes towards Aging Scale	Self-evaluated attitudes towards older people.	This questionnaire includes seven-item 5-point Likert scale questions	(Leedahl <i>et al.</i> , 2020)
	The Attitudes Toward Older People Scale (ATOP)	Self-evaluated attitudes towards older people		
	Maxwell-Sullivan Attitudes and Empathy Toward the Elderly Scale (MSAS) modified with Geriatric Attitudes Scale (GAS)	(3 domains: personal appearance, resemblance, and the nature of interpersonal relations across age generations.	Self-evaluated attitudes towards older people	a 34-item validated scale with 17 positive and 17 negative items.
Attitudes and Knowledge	Self-evaluated attitudes towards older people.		eight-item survey instrument with 5 Likert scale (strongly until strongly agree)	(Abeyaratne <i>et al.</i> , 2020)
	The Adolescent Attitudes towards Dementia Scale (AADS)	Self-evaluated attitudes and knowledge towards older people with three domains: dementia, personal sacrifice, and empathy with people living with dementia	23-item validated measure of attitudes and perceptions of knowledge of dementia, designed for use with adolescents, rated on a 5-point Likert scale ranging from strongly disagreeing to strongly agree.	(Griffiths <i>et al.</i> , 2020)

Table V. Summary of characteristics of included studies

No	Author	Year	Country	Educational Intervention	Participants	Participants' Type	Duration of Interventions	Effect Of Intervention
1	Winkle <i>et al</i>	2012	US	A workshop on empathy performance and discussion	186 pharmacy students and 182 medical students	first year students	3 h	After the workshop, the mean empathy score increased significantly (post-test 1), but returned to the pre-workshop level in post-test 2.
2	Chen <i>et al</i>	2015	US	Aging simulation game (use a modified version of the Geriatric Medication Game)	156	first year students	3 h	First-year pharmacy students reported significant improvements in their empathy and attitude toward older adults after incorporating an aging simulation game.
3	Boarman <i>et al</i>	2016	US	Two separate health screening and education events, one focused on hypertension and the other on diabetes	22	second, third, and fourth year students	2 h per 2 event (4 h)	Positive changes in student comfort and perception were discovered after a geriatric patient experience.
4	Abeyaratne <i>et al</i>	2020	Australia	A two-hour workshop involving older people as university-based instructors	136	first year students	2 h	A two-hour workshop with older people as university-based instructors resulted in immediate improvements in students' self-reported attitudes toward older people.
5	Griffiths <i>et al</i>	2020	Malaysia	'Dementia Detectives' workshop	97	undergraduate and post-graduate medical and pharmacy students	1 h	A one-hour dementia detectives workshop has been linked to better attitudes and perceptions toward older people with dementia.
6	Leedahl <i>et al</i>	2020	US	Intergenerational Reverse Mentoring Program	24 (5 pharmacy students)	Pharmacy students, Arts and Sciences students, and Health Sciences students	N/E	Following participation in the program, students' attitudes toward older adults improved.
7	Lee <i>et al</i>	2020	Malaysia	aging simulation suit and polypharmacy workshop	120	first years	1 h for 2 weeks (2 hours)	There were no significant variations in the JSE-HPS scores between intervention and control groups, and the use of a simulation suit did not increase the self-rated empathy of the participants.
8	Silva <i>et al</i>	2020	Brazil	The Virtual Patient for Geriatric Education (VIPAGE) software program	109	first and second semester	30 hours	There was a considerable improvement in scores among students who had not previously considered employment in sectors that needed contact with the elderly, reflecting students' better attitudes toward the elderly after utilizing VIPAGE.
9	Fong <i>et al</i>	2021	Singapore	an Aging Simulation Workshop, The simulation consisted of four stations: (1) mobility, (2) vision, (3) touch, and (4) hearing.	130	second year	3 hours	The findings demonstrated that after participation in the workshop, the empathy levels of pharmacy students improved dramatically, with no significant differences between the various debriefing methods used.

Duration of the Intervention

The duration of empathy interventions (the amount of time spent on intervention activities) ranged from 1 h to 30 h. One study did not explicitly (N/E) state the duration (Leedahl *et al.*, 2020), particularly the number of intervention hours. This study just mentioned that educational intervention was conducted during the Spring 2016 academic semester.

Educational interventions in seven studies were considered to be “short duration” for 4 h or less (Abeyaratne *et al.*, 2020; Boarman *et al.*, 2017; Chen *et al.*, 2015a; Fong *et al.*, 2021; Griffiths *et al.*, 2020; Lee & Teh, 2020; van Winkle *et al.*, 2012), whereas one study as “long duration” for more than 12 h of intervention because this study used software in the first and second semesters (September 2014 and December 2015) of the required Pharmaceutical Care course (30 h of contact) (Silva *et al.*, 2020) (Table V)

Outcome Measures

All studies used self-report measures to assess the empathy improvement in participants. Self-report measures involved a self-report survey or a single question. Various types of the self-report survey were used. The Jefferson Scale of Empathy-Health Professions Student (JSE-HPS) was the most frequently used self-reported outcome measurement tool, with 4 studies using it (Table IV).

Effect of Interventions

Eight reviewed studies reported a statistically significant increase in empathy or its subdivision. A study did not show a significant improvement found in empathy (Lee & Teh, 2020). Winkle *et al.* (2012) reported that empathy scores significantly increased among pharmacy and medical students ($n = 186$ and $n = 182$, respectively) between pre-test and post-test 1. Similarly, Chen *et al.* (2015) stated that an overall significantly increased empathy in students on both the Kiersma- Chen Empathy Scale (KCES) and the JSE-HPS (Table V).

Educational interventions have as much impact on the physical and emotional well-being of the patient as empathy (Booth *et al.*, 2017). Therefore, the health professional must ensure that empathy is a core component of the curriculum and that the outcomes of educational interventions aimed at increasing the empathy levels of students are properly evaluated. This review aimed to find, evaluate, and synthesize research on educational

interventions that improve the empathy of pharmacy students for geriatrics. This focus was chosen because the educational intervention to change empathy did not only overcome the unconscious and conscious nature of empathy, but also automatically and permanently separates overtime at the state level. Despite differences in study design, data collection, and outcome measures, this review found a clear agreement among studies in terms of the positive impact of educational interventions on empathy toward geriatrics (Booth *et al.*, 2017; Dickinson *et al.*, 2014).

Our findings indicate that educational interventions can effectively foster empathy in pharmacy students. As other author assert, the most promising educational models use experiential approaches to learning (Lee *et al.*, 2018). Most of the included studies conduct experiential training as simulations, role-playing, or learning based on possible scenarios or games, which improve the empathy capacity of participants. These results appear to depend on the nature of the simulation and its pedagogical aspects, as well as the definition of empathy and accompanying measures. The diversity and complexity of the reported pedagogical approaches are fascinating from the teaching point of view, but they make drawing firm conclusions difficult from a research point of view. A review on empathy reported that having repeated contacts with various degrees of intimacy is connected with having an inclusive attitude, which is supported by everyday examples of closeness and intimacy, not simply organized therapeutic activities (Baugh *et al.*, 2020).

Context, background, design, simulation experience (trusting environment, experiential, interactive, collaborative, and learner-centered), facilitator and instructional tactics, participants, and simulation outcomes are all included in the theory (system, patient, and participant). Aging simulation as a multimodal education strategy will be supported by theories such as those of Jeffries *et al.* (2015), which will increase the trustworthiness of measured outcomes and strengthen the consistency and repeatability of the aging simulation for both researchers and educators.

Most of the studies reported a drop in empathy after the intervention, highlighting the difficulties with measurements. Empathy is greatly increased after an intervention, thus this paucity exposes a serious methodological flaw because no knowledge exists about its long-term benefit

(Neumann *et al.*, 2011). Over time, empathy tends to wane (Lor *et al.*, 2015). According to several studies, empathy improves compared to the baseline, but deteriorates compared to post-test and follow-up (Lor *et al.*, 2015; van Winkle *et al.*, 2012). However, some research reveals that empathic decline does not always occur, at least in absolute terms, implying that empathic decline, as a quantitative manifestation of erosion, is not a scientific reality.

A broad search strategy included a wide range of educational intervention diversity and empathy results of pharmacy students, especially toward geriatrics, as a fundamental strength of this study. The findings of this review are interesting and encouraging, they suggesting that future research should focus on transfer to practice and longer-term changes in empathy as study outcomes.

We recognize that the included studies are heterogeneous, implying that more research is needed to determine the best effective empathy educational methods. However, our evidence is insufficient to draw causal conclusions. The most evidence-based and thorough method of summarizing empirical data is to use a meta-analysis approach. Therefore, calculating effect estimates to identify the relevance of educational intervention of improvements in empathy for geriatrics would be highly valuable for future research and educational curricula.

CONCLUSIONS

Our comprehensive review results imply that educational interventions can help pharmacy students retain and improve empathy. Additionally, continuous use of such methodologies will help clarify best practices, and more rigorous research, particularly large, well-controlled longitudinal studies, is required to support pharmacy education recommendations.

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AUTHOR CONTRIBUTION'S

Conception and design: HP, SAK, AWW, YSP; Analysis and interpretation of the data: HP, SAK; Drafting of the article: HP, SAK, AWW, YSP; Critical revision of the article for important content: HP, SAK, AWW; Final approval of the article: HP, SAK,

AWW, YSP; Collection and assembly of data: HP, SAK, AWW, YSP.

CONFLICT OF INTEREST

The authors report that they have no conflicts of interest for this review.

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