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Educational Review

Fostering empathy and self-efficacy in pharmacy students through service learning

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ABSTRACT

Background: Pharmacy student proficiency in direct patient interactions is an integral component of the doctor of pharmacy curriculum. Service-learning experiences offer pharmacy students valuable opportunities to develop self-efficacy and empathy while serving communities with unmet needs. The objective of this review is to evaluate the impact of service-learning experiences on the self-efficacy and empathy of pharmacy and other health professions students.

Methods: A narrative literature review was conducted using PubMed, ERIC, and CINAHL databases. Articles were included if they described the relationship between any health professions student service-learning experience and changes in self-efficacy and empathy. Articles were excluded if they involved simulation experiences, standardized patients, or international experiences.

Results: A total of 11 relevant articles were identified, seven examined changes in student self-efficacy and six assessed student empathy. Articles included students representing seven health professions, with one eligible article in pharmacy. All articles investigating self-efficacy reported a positive impact of service learning on student confidence. Most articles focusing on empathy found that service learning had a positive impact on student empathy, and only one article noted a negative trend. Students with limited prior direct patient care experience had the greatest improvement in clinical confidence and empathy.

Implications: This review adds a new perspective to the literature by evaluating evidence-based service-learning models in pharmacy education. Offering additional structured service-learning opportunities for pharmacy students fosters self-efficacy and empathy while supporting communities with unmet needs. Future studies evaluating innovative service-learning models and methods of continuous assessment within the pharmacy curriculum are warranted.

Introduction

As the clinical role of a pharmacist in an interprofessional patient care team expands, pharmacy student proficiency with direct patient interactions is becoming an integral part of the doctor of pharmacy (PharmD) curriculum. The Accreditation Council for...
Pharmacy Education Standards 2016 highlight the importance of this type of competency in Standard 2, “Essentials for Practice and Care.” This standard requires pharmacy graduates to provide “patient-centered care as the medication experts,” and to “design prevention, intervention, and educational strategies for individuals and communities.” Similarly, in 2017, the American Association of Colleges of Pharmacy developed core Entrustable Professional Activities (EPAs), or professional tasks that pharmacy students must be able to perform independently at the time of graduation. Pharmacy schools are tasked with the responsibility of developing a curriculum that adequately trains students to be competent health care practitioners, as evidenced in part by their ability to perform each EPA domain using the five steps outlined by the Pharmacists’ Patient Care Process (PPCP). Practicing skills within the EPA domains throughout the PharmD curriculum aims to build pharmacy students’ competence and increase a supervisor’s level of trust in the students’ ability to perform core professional activities and skills critical to transitioning to independence upon graduation.

In addition to developing practice-based skills in a simulated environment, pharmacy students must also develop clinical confidence by applying these skills in a direct patient care setting. Self-efficacy is a measure of perceived capability or a belief in one’s ability to complete a specific task. Self-efficacy facilitates the learning process and boosts student academic achievement. Self-efficacious students are more motivated, set and pursue more challenging goals, work harder, have higher rates of persistence, and are more resilient when faced with challenges. Self-efficacy has been studied in pharmacy schools and practicing pharmacists to evaluate confidence levels while engaging in medication therapy management and the PPCP. Higher rates of self-efficacy have been found in students and practicing pharmacists who have had more opportunities to apply practice-based skills in direct patient care settings. In the broader health care professions literature, higher self-efficacy has been associated with increased confidence and independence in making clinical decisions and developing a career plan. These studies suggest that building self-efficacy is an important component of the health professions curriculum. Small studies have investigated tools to evaluate self-efficacy in pharmacy students, but currently, there is no single standard employed by all pharmacy colleges and schools.

Another important psychosocial attribute that helps shift pharmacy students’ clinical perspective from self-centered to patient-centered is empathy. Empathy in a clinical setting is defined as “a cognitive attribute that involves an ability to understand the patient’s inner experiences and perspective and a capability to communicate this understanding.” Empathy enables the student to consider, communicate, and incorporate the patient’s perspective and preferences into therapeutic decision-making. There are personal- and patient-level benefits to empathy in pharmacists. Increased levels of empathy are positively correlated with self-esteem, professional dedication, and clinical competence. Patient-level benefits include improved adherence and better clinical outcomes. The most common validation tool used to assess empathy in pharmacy and other health professions students is the Jefferson Scale of Empathy-Health Profession Students version (JSE-HPS). Studies measuring pharmacy students’ empathy individually and as part of an interprofessional cohort have found that JSE-HPS levels closely correlate with the empathy of other health professions students overall and based on gender, with female students possessing higher levels of empathy compared to male students.

Service learning in the doctor of pharmacy curriculum

One valuable form of experiential learning that positively influences self-efficacy and empathy in health professions students and promotes public health is service learning. Service learning is defined as “a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development.” Service learning connects didactic and laboratory learning with the ability to apply these skills through a structured, outcomes-driven experience that also benefits the community that it serves. In addition, incorporating reflection distinguishes service learning from other types of service activities. Student reflection has been shown to improve communication skills and to increase awareness of cultural influences that may impact health behaviors and adherence to therapy. There are several examples of exemplary service-learning models in pharmacy schools across the country that target populations or communities with unmet needs, including older adults, Indigenous communities, and various community sites based on student interest. Although each model is unique and uses different methods, all incorporate structured student assessment and self-reflection. Pharmacy students who have service-learning experiences have shown improved communication, cultural competence, ability to work with vulnerable populations, and awareness of community organizations.

Pharmacy students may also develop empathy and self-efficacy through various forms of community service, volunteerism, or internships. However, these experiences lack one or more components of service learning (e.g., structured learning outcomes) and often result in an imbalance in benefits to those participating in the interaction. Therefore, while these types of experiences are beneficial, employing an authentic service-learning model that strikes a balance between the students and community benefitting from the experience is ideal.

In this narrative literature review, we evaluate the relationship between health professions student participation in service learning or mandated curricular experiences (e.g., introductory pharmacy practice experiences (IPPEs) and advanced pharmacy practice experiences (APPEs)) and their impact on self-efficacy and empathy.

Methods

A narrative literature review was conducted using PubMed, ERIC, and CINAHL databases. A reference librarian developed the following keywords or MESH terms used in the search: empathy, self-efficacy, experiential learning, service learning, student health occupations, education professional, preceptorship, clerkship, pharmacy graduate, dental graduate, and medical graduate. These terms are not interchangeable with “clinical practice,” “clerkships,” “IPPE,” or “rotations,” which refer to non-service-related activities.
that are evaluated using a criterion-based grading system. The search was restricted to English language articles without date limits.

Two pharmacists independently reviewed each article to determine if it met the criteria for inclusion. The reviewers came to a consensus for all articles reviewed. To evaluate articles for inclusion, abstracts were first reviewed for relevance followed by a full text review of relevant articles. Articles were included if they described the relationship between any health professions student curricular or extracurricular experiential learning activity and changes in self-efficacy or empathy using quantitative measurement tools. Articles were excluded from this review if they involved simulation experiences or standardized patient activities, as the primary focus of this review was direct patient interactions. International experiences were excluded, as students who choose to participate in this type of opportunity may only represent a small subset of the typical student population. Articles using qualitative measures of self-efficacy and empathy, such as reflective writing as the primary method for assessing self-efficacy or empathy were excluded. This is due to the lack of standardized tools utilized in these studies, small sample sizes, and the fact that conclusions drawn from these studies are highly subjective. Review articles were also excluded.

The following components of each included article were compiled to provide a tabular summary: student type, experience description, characteristic assessed, tool for assessment, results overview, and sample size. The studies were then grouped by assessment of self-efficacy and empathy for comparison of assessment tools and results.

Results

Overview

The CINAHL and ERIC searches resulted in 205 and 102 articles, respectively, while the PubMed search generated 398 articles. After abstract review, a total of 62 articles were considered for inclusion, with a final count of 11 unique articles after full text review and removal of duplicates. A total of 11 relevant articles published between 2003 and 2020 were identified during this search. Seven articles focused on changes in student self-efficacy, and six examined student empathy. While Mastel-Smith et al.

Five of the 11 experiences described were extracurricular, indicating that student participation was voluntary and they did not receive academic credit for the experience. The remaining articles described projects or experiences that were components of the school curriculum. The study methods and results of each article are described in depth in the Table 1. Combined, the studies included 1421 students representing seven health professions.

Service-learning opportunities varied in scope, with some involving clinical activities, such as conducting a patient history and physical exam. Other experiences provided a range of community engagement opportunities, including mentoring, promotion activities, and in-home interviews. Students were required to reflect on patient experiences as a key component of service learning in 10 of the 11 studies included. The service-learning experiences in this review provided services to a diverse cohort of people in the community, including older adults with dementia or Parkinson’s disease, people experiencing homelessness or financial instability, and other members of the community.

Tools for assessment

Each study used different survey tools to assess changes in student self-efficacy and empathy. Of the seven self-efficacy tools utilized, three have been validated in previous studies. The scales utilized by Choi et al. and Mastel-Smith et al. both assessed students’ confidence in working with patients living with dementia, while the scale developed by Smith et al. was specific to people experiencing homelessness or financial challenges. Three studies utilized self-efficacy tools that were geared toward the students’ future profession, which included counseling, pharmacy, and medicine.

Across the six studies that assessed empathy, a total of seven different tools were utilized. Brown et al. developed their own non-validated open-ended survey. The remaining studies utilized previously published tools, and five of the six tools have been previously validated. Two studies utilized the Dementia Attitudes Scale (DAS), while a third utilized a scale tailored toward patients with Parkinson’s disease. Two studies utilized scales that were developed to assess empathy toward homeless or underserved populations. The Table 1 provides a more detailed description of tools used in these studies.

Self-efficacy study findings

The self-efficacy studies were representative of several cohorts of health professions students, and all reported a positive impact on student confidence. Professions represented in the studies included one of each in counseling, pharmacy, public health, physician assistants (PAs), and two of each in nursing and medical students. Five of the studies involved primarily clinical experiences, where students engaged in direct patient care related to their field of study. Barbee et al. found that students who engaged in counseling experiences, including mentoring, facilitating grief and loss groups, and giving psychology presentations in the community, tended to score higher on the Counselor Self-Efficacy Scale, which assesses confidence in providing counseling, than those who did not engage in these activities (P < .03). Similarly, in the McLaughlin et al. study, self-efficacy levels increased in pharmacy students who performed medication reconciliation and who worked with an interprofessional team for three five-hour shifts in a hospital setting. Notably, there were several areas with no significant change in confidence in demonstrating a particular skill, including assessing a patient’s understanding of their medication regimen, identifying social or behavioral factors that impact medication adherence, using empathy when speaking with a patient, documenting in a medical record, and assisting other health professionals.

While Mastel-Smith et al. found that participating in a Dementia Care Bootcamp was associated with an increase in nursing
### Table 1
Characteristics of health profession students’ pre-practice.

| Authors and title | Student type | Description of the experience | Empathy or self-efficacy | Tool for assessment | Results | Sample size |
|-------------------|--------------|-------------------------------|--------------------------|---------------------|---------|-------------|
| Barbee et al.     | Students pursuing a master’s degree in counseling | Students were required to do a minimum of 30 h in a school or a community agency setting as part of a service-learning project (Traverse Outreach Project). The supervised experiences included mentoring, giving educational presentations, and facilitating group sessions. | Self-efficacy | Counselor Self-Efficacy Scale, a validated instrument to measure confidence to provide group and individual counseling and the state-anxiety scale | Students who do not have previous counseling experience may have increased self-efficacy and decreased anxiety if exposed to service learning early in their school careers. Students who were involved in the service-learning project had higher self-efficacy and lower anxiety scores. Those with previous counseling experiences also had higher self-efficacy scores. | 113 |
| Brown et al.      | Undergraduate nursing | Volunteering service-learning course focused on older adults | Empathy | Open-ended survey (not validated) and reflective journals | Pre-experience surveys and journals expressed negative feelings about working with older adults while post-experience reflections suggested increases in caring, compassion, and respect indicative of a rewarding, “life-changing” experience. Students experienced positive change in attitude toward older adults after participating in service learning involving older adults. | 45 |
| Choi et al.       | Undergraduate nursing, public health, social work | Students volunteered as data collectors for a dementia-focused research project. The students conducted one-on-one interviews and home visits with people with dementia and their caregivers. Students attended a preparation workshop prior to participation in the volunteer program. | Self-efficacy and empathy | Adapted Self-Efficacy Scale -assessed confidence in interacting with patients with dementia and their caregivers. | Significant increase in mean self-efficacy from pre- to posttest ($P < .001$). Mean Dementia Attitudes Score did not change ($P = .07$). There was a decrease in target complaints regarding communication with caregivers and patients and knowledge of dementia. Students showed changes in attitudes (continued on next page) | 21 |
Table 1 (continued)

| Authors and title                                                                 | Student type                                                                 | Description of the experience                                                                 | Empathy or self-efficacy                                                                 | Tool for assessment                           | Results                                                                 | Sample size |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-------------|
| Cumberland et al.                                                                 | Experiential learning: transforming theory into practice through the Parkinson’s Disease Buddy Program | Students volunteered to participate in a Parkinson’s Disease Buddy Program where each student was matched with a patient for the nine-month academic year. Buddies were required to meet at least once per month for two to three hours at a mutually agreed upon time and an activity of the pairs’ choosing. Students also attended a monthly one-hour seminar with a movement disorder specialist. | Empathy                                                                                   | Modified Geriatric Attitude Scale/ Parkinson’s Attitude Scale (PAS) | A paired t-test found a significant change in PAS score t (34) = 2.22, $P < .05$. Student interest in neurology pre-program was 42%, but increased to 49% post-program. Overall, the average student reported benefit from participation in the program was 4.5 out of 5. Also, post-program, 91% of the students stated that they would recommend the program to others and 82% stated that they would participate again. | 35          |
| Jarrell et al.                                                                   | Constructing the foundations for compassionate care: how service-learning affects nursing students’ attitudes toward the poor | Students placed in a homeless shelter and low-income independent housing where they provided health education, health promotion, and basic medical care. Students spent one day a week for 15 weeks providing care at both facilities. | Empathy                                                                                   | Attitudes about Poverty and Poor People Scale; Just World Scale | There was an improvement in empathy toward individuals of low socio-economic status, specifically a better understanding of and appreciation for the barriers faced by the poor. | 40          |
Table 1 (continued)

| Authors and title | Student type | Description of the experience | Empathy or self-efficacy | Tool for assessment | Results | Sample size |
|-------------------|--------------|--------------------------------|--------------------------|---------------------|---------|-------------|
| Knight et al.     | Physician assistant | Students analyzed community needs and then prepared for a service experience interacting with homeless and vulnerable citizens. | Self-efficacy | Self-developed survey (not validated) that included a self-evaluation of leadership skills and assessment of interest in social justice | Significant increase in self-efficacy in 10 leadership competencies from pre- to posttest. Interest in social justice domains such as respect for others in the community and the right for decent employment increased. | 68 |
| Mastel-Smith et al. | Undergraduate nursing enrolled in Psychiatric Mental Health Nursing course | All students participated in a 10-h Dementia Care Bootcamp, involving a Virtual Dementia Tour, engaging case studies, and listening to experiences from caregivers. | Empathy and self-efficacy | Dementia Attitudes Scale, 20 questions about perceptions of people with dementia and feelings toward the population | Significant improvement in attitudes ($P = .002$) and self-confidence ($P = .02$) in both groups. | 100 |
| McLaughlin et al. | Second-year student pharmacists were randomly selected from volunteers, given program training | Three, five-h evening shifts with the Student Medication and Reconciliation Team (SMART) program at UNC medical center | Self-efficacy | Self-efficacy scale survey developed using Bandura’s guidelines; written reflection after each shift | Based on the self-efficacy survey, students had significant increase in median score for the following: reviewing and synthesizing information ($P = .002$), describing purpose of medication history to patient ($P = .05$), completing the medication history ($P = .01$), and identifying medication-related problems ($P = .02$). Student perception of SMART program: | 19 |
Table 1 (continued)

| Authors and title | Student type | Description of the experience | Empathy or self-efficacy Tool for assessment | Results | Sample size |
|-------------------|--------------|--------------------------------|-------------------------------------------|---------|-------------|
| Pierangeli et al. | Undergraduate public health and senior nursing students | • Students participated in an in-depth didactic overview on social and health disparities that impact the homeless/housing insecure population. Students then participated in the federally mandated one day Point-In-Time count of unsheltered persons, which involved interviews and documentation of the findings. Students also had the option to volunteer at a homeless shelter. | Empathy Health Professionals Attitudes Toward Homeless Inventory tool (HPATHI) and reflective journal | • Comparing the pre- and post-intervention HPATHI responses, students reported an increase in self-reported understanding of homelessness from 23.1% to 51.9% \( (P = .004) \). In contrast, students reported an increase in perception of physical danger associated with homeless persons from 21.1% to 42.3%. • After the experience 82.7% of students agreed that “homeless people come from all walks of life” and 84.6% reported feeling comfortable working on a team to provide care or service to the homeless. | 28 |
| Sin et al. | Medical students | • Constructing Care Collaboration (CCC) is a student-led service-learning initiative that gives medical students in Singapore the opportunity to volunteer at charity community clinics that serve migrant workers. • Medical student volunteers attended a clinic session once a month for six months. Each session focused on a different aspect of migrant worker life. During volunteer sessions, medical students helped take | Self-efficacy Adopted questions from the Fund for the Improvement of Postsecondary Education (FIPSE) Ability Scale which is used to self-evaluate skills developed from service-learning projects. It assesses skills in nine domains including leadership, communication, teamwork, ability to see consequences, critical thinking, ability to identify social issues, action skills, gaining of knowledge, and application of knowledge. Qualitative interviews were also conducted to assess the impact of CCC on empathy. | • The majority of students reported that the experience in CCC improved their skills in all nine domains assessed by the FIPSE instrument. • Improvement in empathy and social awareness and cultural competency were two of the four major themes identified from the qualitative student interviews. | 38 |

(continued on next page)
Table 1 (continued)

| Authors and title                                                                 | Student type                | Description of the experience                                                                 | Empathy or self-efficacy                           | Tool for assessment                        | Results                                                                 | Sample size |
|----------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------|-----------------------------------------------------------------------|-------------|
| Smith et al.                                                                       | First- and second-year medical students | Students conducted interviews in older adults with dementia and their caregivers to assess their level of satisfaction with community resources for older adults living with dementia. |          | Developed survey with 15 statements, seven-point Likert scale, validated; statements in four categories: knowledge, skills, attitudes, self-efficacy. | There was a significant increase in scores on all 15 survey questions in matched-pairs analysis and intention-to-treat analysis (P < .002). There was also a significant increase in the self-efficacy category regarding caring for the underserved and homeless (P < .01). | 914         |

UNC = University of North Carolina at Chapel Hill.

Student confidence in working with patients with dementia; an additional daylong clinical experience at a dementia day care center was not associated with any further increase in self-efficacy. However, studies designed to evaluate students participating in longitudinal experiences were associated with improvements in self-efficacy across all categories assessed.26,34

In the study of PA students, the authors focused on a unique aspect of self-efficacy as part of leadership development while students engaged service projects with community organizations.31 Finally, in the study by Choi et al.,29 an interprofessional cohort of nursing, public health, and social work students interviewed patients and their caregivers to assess their level of satisfaction with community resources for older adults living with dementia. The self-efficacy assessment in this study focused on communication skills and the level of confidence conducting interviews.

Empathy study findings

Overall, the six studies that assessed empathy found positive changes in students’ attitudes after participating in service-learning experiences. The empathy studies focused primarily on medical, nursing, and public health students. In four of the studies, health professions students engaged in service learning with older adults, patients with dementia, or those with Parkinson’s disease.28,29,33,36 In two studies of health professions students who engaged in longitudinal experiences with older adults in the community, students expressed anxiety about working with this patient population.28,33 Brown et al.28 found that at the end of one semester of weekly visits with older adults, there was a significant change in students’ attitudes and previous stereotypes held about this population. Similarly, medical students’ attitudes toward older adults living with Parkinson’s disease changed, and they expressed positive perceptions of working with this patient population after the experience.33

Two studies used the DAS to assess changes in student empathy toward older adults living with dementia. The study by Choi et al. assessed nursing and social work students that participated in a service-learning project to conduct interviews in older adults with dementia. While the students did not experience a significant increase in their objective scores on the DAS after participation in the project, they did express a positive perception of caring for patients with dementia and decreased prejudice toward people living with dementia. Mastel-Smith et al. compared changes in efficacy levels using a two-part intervention. Nursing and social work students participated in a 10-h Dementia Care Bootcamp, which included a simulated patient experience, case studies, and quizzes. After the bootcamp, half of the students participated in a one-day clinical experience at a dementia day center, while half of the students did not engage in a live clinical experience. The authors found that both groups of students had significant improvements on both the DAS and the Confidence in Dementia Scale, which measures self-confidence in treating dementia. Participation in the one-day clinical experience was not associated with higher scores, but this portion of the intervention may not have been long enough to detect a significant improvement in student attitudes and confidence.
Two studies evaluated changes in nursing students’ attitudes and empathy toward people experiencing homelessness or poverty.\textsuperscript{30,32} In the study by Jarrell et al.,\textsuperscript{30} a cohort of nursing students participated in a 15-week program to provide medical care and education to residents of homeless shelters or independent housing, all with incomes below the poverty line. The intervention group was compared to a control group of students placed in other community settings that did not specifically provide services to communities with high poverty rates.\textsuperscript{30} Pre- vs. post-experience assessments of student attitudes and perceptions of the “poor” people were evaluated using the Attitudes about Poverty and Poor People Scale (APPPS) and the Just World Scale (JWS). Higher scores on the JWS indicate a student’s belief that in a “fair world,” people get what they deserve, while lower scores indicate a lack of belief in a just world. While scores in the intervention group showed a decline on the post-JWS survey, these findings were not significant compared to the control group. Likewise, the APPPS results did not find a significant difference between the service-learning and control groups. Student reflection journals noted a positive change in level of awareness of factors that create barriers to accessing adequate health care for individuals with low socioeconomic status.\textsuperscript{30} In the study by Pierangeli et al.,\textsuperscript{31} students participated in a once-daily Point-In-Time count and interviews of unsheltered people. Pre- vs. post-experience scores on the Health Professionals Attitudes Toward Homeless Inventory noted a significant change in the students’ level of empathy and comfort with providing care to people experiencing homelessness.

**Professionalism study findings**

Of the 11 studies, one article, by Knight et al.,\textsuperscript{31} correlated changes in self-efficacy to professional development and leadership. This study assessed the outcomes of 68 PA students who completed 10 service hours working in various resource facilities for homeless individuals. Using surveys developed for use in this study, students showed a significant increase in self-efficacy in the 10 leadership competency domains.

**Other empathy and self-efficacy studies**

Of the articles reviewed, two articles were notable but did not meet the inclusion criteria for the review. In a nursing student study, White et al.\textsuperscript{40} compared the impact on current employment type of undergraduate nursing students (i.e. extern, nursing assistant, or non-health care employment) on self-confidence and anxiety using the Nursing Anxiety and Self-Confidence with Clinical Decision Making tool. The study results show an overall positive trend toward increased self-confidence and decreased anxiety with any form of employment, but participation in a nursing externship program showed a significant increase in self-confidence and reduced anxiety. The White et al.\textsuperscript{40} study was excluded because the design utilized an intervention with financial incentive.

Wolden et al.\textsuperscript{41} assessed the impact of a required 16-h learning experience on physical therapy students’ self-efficacy when working with pediatric patients.\textsuperscript{41} Student changes in self-efficacy were assessed through a pre- and post-experience assessment on the Pediatric Communication and Handling Self-Efficacy Scale (PCHSES). A total of 32 students completed the PCHSES. On average, students had significant increases in communication ($P < .001$) and patient handling ($P = .001$) self-efficacy. This study was excluded because it focused on managing pediatric patients.

**Implications**

This literature review shows that early engagement with service-learning experiences prior to, or in addition to, clinical practice improves health professions students’ self-efficacy and empathy. One article also found that service-type learning experiences may be associated with improvements in professionalism. All seven self-efficacy articles reported positive quantitative changes in student self-confidence.\textsuperscript{26-32} The results of the empathy articles, although more qualitative by design, reported positive changes in student attitudes after the intervention.\textsuperscript{28-30,33,35,36} A common theme across all articles reviewed was that students with limited baseline clinical experience benefit most from direct patient engagement. These findings correlate with data that found that pharmacy students who engage in more than the required 300 h of IPPEs have higher levels of self-efficacy.\textsuperscript{42}

In this review, most studies were cross-sectional in design, evaluating stand-alone experiences early in the curriculum. The studies rely heavily on pre-/post-assessment designs rather than assessment of outcomes across multiple courses within the curriculum. Therefore, it is difficult to extrapolate beneficial results of change in student attitudes and performance during these early experiences to other courses within the curriculum and throughout the course of training. For example, in one of the largest studies of empathy and self-efficacy in medical students, the students were only surveyed at the end of the experience. Therefore, it is difficult to determine if changes were sustained as students progressed through the curriculum.\textsuperscript{26}

The length of experiences varied widely, from 10 h to nine months. In the study evaluating pharmacy students, discreet skills practiced in other parts of the curriculum (e.g., medication reconciliation) showed significant improvement.\textsuperscript{35} However, more nuanced skills were unchanged from baseline, suggesting that the length of the service-learning experience may have been too brief to result in a significant, observable change. Other studies that noted a minimal change in students’ attitudes and perceptions may have been limited by short study duration.\textsuperscript{26,36} These studies suggest that while individual experiences are beneficial, building self-efficacy and other more nuanced affective skills may require multiple experiences and reflection over time to result in an observable, meaningful, and persistent change.

Although not a primary area of focus, this review highlights the value of service learning to expose health profession students to communities at risk of structural vulnerability and health disparities.\textsuperscript{26,41} The Center for the Advancement of Pharmacy Education outcomes acknowledge that the full impact of clinical interventions cannot be realized without factoring in social determinants of
health (SDOH). Incorporating service-learning experiences in tandem with simulated learning in the curriculum can increase pharmacy student self-efficacy and empathy with vulnerable populations and increase awareness of the impact of SDOH in a real-world setting.

**Limitations**

There are several limitations to the interpretation of the studies presented in this review, including use of cross-sectional designs, small sample sizes, lack of standardized study design, and survey methodology. There was only one small study eligible for inclusion in this review that evaluated pharmacy student outcomes. Additional relevant articles may not have been captured in this review based on the search strategy.

The articles included in this review utilize various tools for the assessment of self-efficacy and empathy. The diversity of experiences and assessment tools used makes it challenging to directly compare measurements of self-efficacy and empathy across studies. However, direct comparisons are likely not helpful given the unique service-learning models described in this review. More studies that employ well-designed tools to examine the impact of service learning on building affective skills necessary for pharmacy students engaged in patient-centered care are warranted.

**Conclusion**

Structured service-learning models that provide ongoing opportunities for hands-on learning while serving patients or the community build self-efficacy and foster empathy in health professions students. The service-learning model is a valuable tool within health professions training that connects didactic knowledge and experience with the lived experiences of patients in the community. Students with limited prior patient care experience will likely experience the most benefit from these experiential opportunities.

Based on this review, there is no singular experience that emerges as ideal, but the studies suggest that service learning is a versatile and effective model to cultivate self-efficacy and empathy in pharmacy and other health professions students while increasing access to critical services for communities with unmet needs. Although student attitudes and opinions may not change after one experience, students can develop an increased awareness of the impact of SDOH and structural barriers to health that vulnerable communities experience.

This review highlights new themes and research questions for pharmacy education where evidence is lacking. Studies evaluating approaches to incorporate and assess these core affective skills throughout the PharmD curriculum are needed. Developing standardized rubrics to assess student progression may allow for a more robust assessment across the curriculum to determine how well students are prepared to perform these skills during APPEs and ultimately as they enter the workforce. It is also important to acknowledge the emerging limitation of traditional “live” experiential learning models during the current pandemic, which has significantly altered the access to and the structure of experiential opportunities. Future studies should explore innovative, socially distanced service-learning models to facilitate intentional development of these competencies and interpersonal skills in the setting of virtually delivered patient care.

**Disclosure(s)**

None.

**Declaration of Competing Interest**

None.

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