

Survey highlights the need to expand offerings of introductory pharmacy practice experiences in psychiatry and neurology: Benefits and example experiences

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Abstract

Introduction: Introductory pharmacy practice experiences (IPPEs) are 1 requirement schools and colleges of pharmacy must fulfill to meet accreditation standards. The purpose of this manuscript is to report existing IPPEs in psychiatry and neurology across the United States.

Methods: Two separate electronic surveys were administered to individual College of Psychiatric and Neurologic Pharmacists members with board certification in psychiatric pharmacy with an academic affiliation and academic institutions in the 2014-15 academic year to assess the neuropsychiatric curriculum in pharmacy programs. Results focusing on IPPEs were summarized using descriptive statistics.

Results: Academic institutional data reveal only 37.3% offered IPPEs in psychiatry, and 6.7% offered neurology. The number of available IPPEs is low even if a program offered an available rotation. The majority of College of Psychiatric and Neurologic Pharmacists member respondents (69.9%) did not offer IPPEs in psychiatry in the 2014-15 academic year, and none offered an IPPE in neurology. More than half of individual respondents feel their institution should increase IPPEs in psychiatry and neurology in order to enhance their curriculum.

Discussion: To expand IPPE availability, pharmacy programs should increase early exposure of pharmacy students to patients with psychiatric and neurologic conditions. Longitudinal experiences may allow students to engage in hands-on experiences, which may impact future career aspirations and reduce stigma. Current example IPPEs at the authors' institutions are included to stimulate discussion and action among readers on how IPPEs in these practice areas may be developed. Implementation of IPPEs in psychiatry and neurology is needed for students to gain experience working with these patients.

Keywords: IPPE, introductory pharmacy practice experience, experiential education, psychiatry, neurology, survey, rotation

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Background

Beginning in September 2016, all schools and colleges of pharmacy evaluated by the Accreditation Council for Pharmacy Education must comply with the 2016 Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree.¹ Similar to the 2007 standards, the 2016 standards outlined the expectation that all pharmacy education programs include introductory pharmacy practice experiences (IPPEs) in the experiential course work in addition to advanced pharmacy practice experiences (APPEs).^{1,2}

The primary goal of IPPEs is to provide early hands-on experiential exposure to both medication distribution systems and team-based patient care. In general, there is a much greater emphasis in the 2016 standards for pharmacy programs to prepare students to be practice- and team-ready.¹ This allows students to integrate and apply information learned in the classroom into the pharmacy practice setting.¹ This means moving beyond a simple shadowing experience historically utilized by pharmacy programs and allowing students a greater opportunity to expand knowledge and skills through IPPEs. Accreditation Council for Pharmacy Education encourages programs to utilize a “variety of IPPE delivery mechanisms”^{1(p24)} to ensure students have the foundation necessary to fulfill APPE expectations. This allows programs to be creative when developing IPPE learning opportunities and opens the door for early exposure to psychiatry and neurology.

Exposing pharmacy students to patients diagnosed with psychiatric or neurologic conditions early in their curriculum is particularly important. Individuals with psychiatric or neurologic conditions often experience stigma even from the most well-intentioned health care providers.³ Although didactic course work or exposure to mental health treatment can be helpful in reducing stigma,^{4,7} the long-term impact of these interventions alone is unclear.⁸ However, early clinical exposure to psychiatric and neurologic conditions reduces stigma and increases respect and compassion for patients.³ Introductory pharmacy practice experiences can also be used to raise awareness among students regarding ethics and Health Insurance Portability and Accountability Act privacy rules as they apply specifically to psychiatry and neurology.

Although there is limited information available regarding the design of IPPEs in pharmacy programs, descriptions of experiences specific to psychiatry and neurology have not been previously published. The primary purpose of this manuscript is to briefly highlight survey results as well as provide examples of IPPEs that expose students to psychiatry and neurology in pharmacy programs across the United States.

Methods

Two surveys were developed by Dopheide et al⁹ engaging both (1) academic institutions and (2) individual College of Psychiatric and Neurologic Pharmacists (CPNP) members who were board certified in psychiatric pharmacy with an academic affiliation regarding the neuropsychiatry curriculum during the 2014-15 academic year in pharmacy programs across the United States.⁹ The surveys were administered from September through December 2015 and sent to 133 academic institutions and 267 CPNP members. Individuals involved in both surveys were asked to report on IPPEs. Survey data were taken into account for all returned surveys, including surveys in which some portions were incomplete. Results focusing on IPPEs were summarized using descriptive statistics. Both surveys were reviewed by the original task force,⁹ field testers, CPNP board of directors, and American Association of Colleges of Pharmacy educational services staff and were approved by the University of Southern California’s institutional review board.

Additional results from the surveys have been published⁹; however, the current article summarizes data received from this survey focusing on IPPEs as the previously published article primarily focuses on APPEs and other curricular aspects.

Results

Academic Institution Results Quantitative Data

Responses to the institutional data were received from 75/133 (56%) pharmacy programs. Of the 75 respondents, only 51 responded to IPPE-related items within the survey, which is an overall response rate of 38.3% from all pharmacy programs for these specific survey items. The original study demonstrated survey respondents represented pharmacy programs across the United States based on characteristics including class size, region, private/public status, and program age.⁹ Responses from academic institutions revealed substantial variability in IPPE offerings in psychiatry and neurology. The Table outlines responses for each IPPE practice area. More than 60% of academic institutions (32 out of 51 respondents) reported having no available IPPE for acute care inpatient psychiatry. Among academic institutions with IPPEs in acute care inpatient psychiatry, there was a wide response range (1 to 48) with a median of 6 slots. All responses but 1 fell within the range of 1 to 18 with an outlier of 48 slots. More than 90% of institutions (42 out of 45 respondents) reported having no available IPPE slots for acute care inpatient neurology. Of the 3 institutions with IPPEs, 1 had a single slot; the other 2

TABLE: Summary of introductory pharmacy practice experiences (IPPEs) availability/slot(s) from academic institutional survey

| Type of IPPE Rotation | No. of Respondents | Percentage of Respondents Having no IPPE Offering (n) | Range or No. Available Among Those That Offer IPPE Slot(s) | Median (offerings) |
|---|--------------------|---|--|--------------------|
| Ambulatory care neurology general (all major neurologic illnesses) | 38 | 100 (38) | ... | 0 |
| Ambulatory care psychiatry specialty clinic (eg, clozapine clinic, mood disorders clinic) | 39 | 97.4 (38) | 1 | 1 |
| Ambulatory care neurology specialty clinic (eg, headache/multiple sclerosis clinic) | 39 | 97.4 (38) | 20 | 20 |
| Forensic psychiatry | 39 | 94.9 (37) | 5 to 15 | 10 |
| Acute care inpatient neurology | 45 | 93.3 (42) | 1 to 10 | 10 |
| Geriatric psychiatry | 43 | 93.0 (40) | 4 to 16 | 8 |
| Substance use disorders or addiction medicine | 43 | 93.0 (40) | 2 to 16 | 15 |
| Ambulatory care psychiatry general (all major psychiatric illnesses) | 47 | 83.0 (39) | 1 to 16 | 4 |
| Acute care inpatient psychiatry | 51 | 62.7 (32) | 1 to 48 | 6 |

had 10 slots. Similar data and distribution is seen in different practice areas of psychiatry and neurology. No respondent answered questions related to the availability of an IPPE in pediatric psychiatry.

Academic Institution Results Qualitative Data

Only 1 survey respondent provided qualitative feedback stating they are increasing IPPE and APPE rotations.

Individual Member Results Quantitative Data

In addition to the academic institution survey, CPNP members with academic affiliations were surveyed on the topic of IPPEs in psychiatry and neurology. The survey response rate reported in the article by Dopheide et al⁹ was 173/267 (64.8%) because the article only included survey results with a completion of more than 80% in specific fields. The respondents comprised tenure-track (17%), non-tenure track (39%), and adjunct faculty (39%).

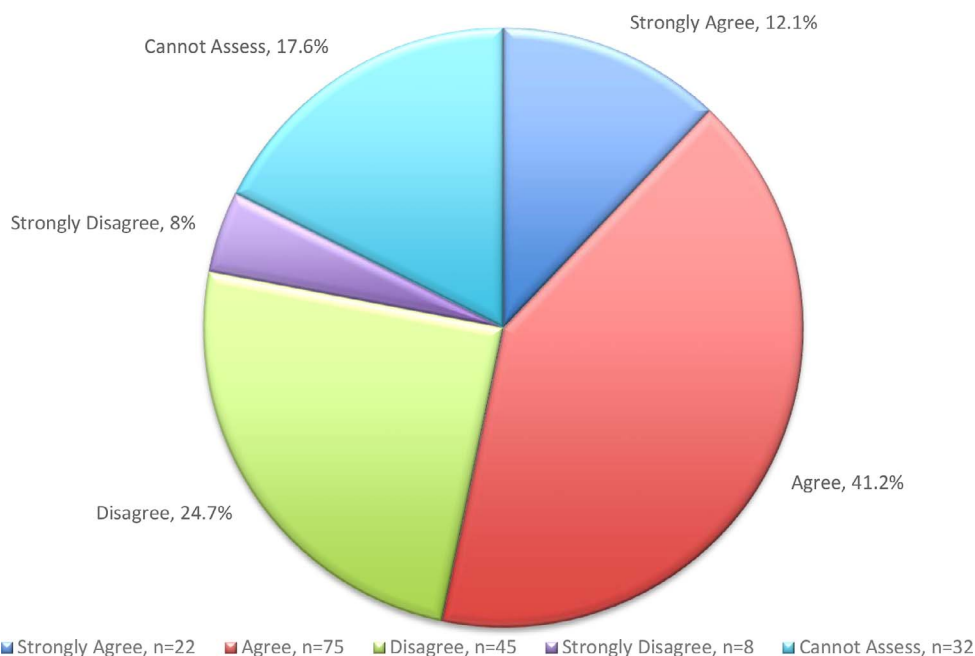


FIGURE 1: Member responses to statement: My institution needs to increase offerings for introductory pharmacy practice experiences in psychiatry and neurology to improve the curriculum

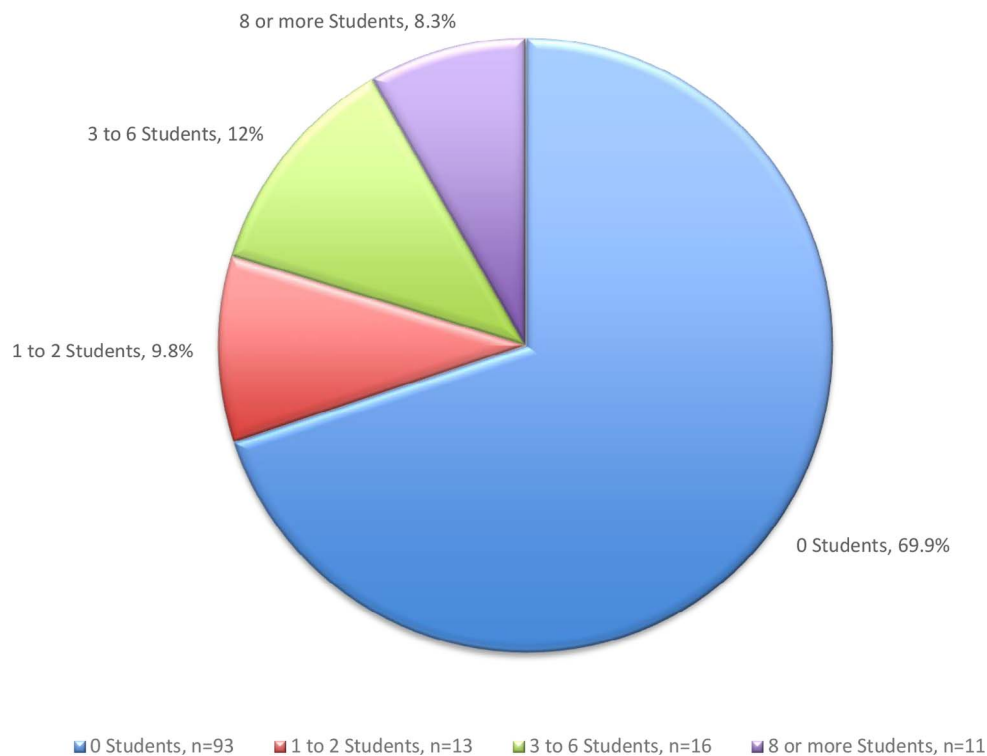


FIGURE 2: The number of introductory pharmacy practice experiences students precepted in psychiatry in academic year 2014-15

Further, among faculty, most were assistant professors (31%), followed by associate professors (25%), and full (16%), and others classified themselves as clinical instructors or research faculty. Forty percent of respondents reported practicing at government-funded medical centers.⁹

In order to capture all available data on IPPE-related items for this manuscript, the response rate was expanded to any individual responding to these items, 182/267 (68.2%).

Figure 1 depicts member responses on whether academic institutions need to increase offerings for IPPEs in psychiatry and neurology to improve the curriculum, n = 182.

Figure 2 depicts the number of IPPE students precepted in psychiatry in the academic year 2014-15, n = 133. Note the number of respondents is much lower than the previous item described (182 vs 133) related to unanswered items by some survey respondents.

Individual Member Results Qualitative Data

Of IPPEs precepted by CPNP members, the experiences described were administration, observation at hospital and ambulatory care settings (eg, shadowing), hospital rotation, medication reconciliation, and research, and 1 respondent specifically highlighted the longitudinal structure of their

IPPE over 8 months. One individual expressed privacy concerns and lack of computer support for IPPE students as barriers for IPPE students on psychiatry rotations in addition to APPE students. With regard to what skills should be included in IPPEs, the following were mentioned: mental status examination, shared decision making, and medication education groups. In addition, 1 survey respondent expressed a psychiatric IPPE requirement (or at least an offering) might be helpful to develop more psychiatric clinicians. He or she expressed that future surveys might be directed at new graduates who were exposed to IPPEs in psychiatry and the impact the experience had on subsequent pursuits, including future career(s).

Discussion

In order to better identify the impact of IPPE exposure and promote the specialties of psychiatry and neurology, we must first begin to expand the opportunities available. Our survey results demonstrate the majority of pharmacy programs across the United States do not offer IPPEs in the areas of psychiatry and neurology with neurology IPPEs being the lowest, despite the majority of clinicians agreeing that institutions should expand these experiences. Although there may be a small number of programs who are outliers, it is important to highlight that the number of available IPPEs is low even if a program may offer an available rotation.

Across the United States, there are a limited number of clinical pharmacists practicing neurology. With the growing demand for neurologic care,¹⁰ creating neurology-based IPPE trainings could help familiarize students to clinical care in neurology at an early stage in the curriculum. By creating a neurology-based IPPE program that incorporates critical pharmacy practice aspects and emphasizes clinical communication skills, students can exhibit more desired clinical behaviors in future clinical settings.¹¹ Literature has also shown that providing positive experiential learning opportunities within a specialty area can lead to the pursuit of positions that involve that particular specialty.¹² By creating additional practice positions in neurology, both the number of clinical pharmacists practicing in this area as well as the opportunity to train IPPE students can be expanded. Additionally, creation of such positions could provide an opportunity to expand and support pharmacy services as well as institutional goals.

Opportunities to develop new or modify existing IPPEs to introduce students to psychiatry and neurology are vast. However, based on comments, many of these experiences appeared to be focused on shadowing in different settings and may have been 1 component of the students' broader IPPE experience. One respondent commented on the longitudinal nature of the IPPE at his or her institution, but block versus longitudinal IPPE opportunities were not specifically delineated in our survey. However, survey results reported by Galinski and colleagues¹³ suggest at least some IPPEs are offered longitudinally at the majority of US pharmacy programs (69%). The authors feel utilization of a longitudinal IPPE experience may allow for greater student involvement in activities highlighted above, such as medication education groups. This is more likely if longitudinal experiences are available during or following completion of didactic course work compared to assigned IPPEs that may take place prior to delivery of the psychiatric and/or neurologic content. Following students involved in blocked versus longitudinal IPPEs and evaluating student outcomes on patient care requires further study. Additionally, expansion of early practical experiences, whether in psychiatry or neurology, may reinforce and/or complement what is taught in didactic courses. Moreover, it can assist in familiarizing the student with in-depth interactions with the health care team and interprofessional clinical decisions for patients diagnosed with psychiatric and neurologic disorders. Incorporating IPPE students in psychiatric and neurologic practice settings allows for hands-on experience with collecting patient information, conducting neurologic and mental status exams, and incorporating the findings into an assessment and treatment plan.

Limitations of our study include our survey response rate. It is important to note not all pharmacy programs are

represented. Second, it is conceivable that additional exposure to psychiatry and neurology is provided by institutions and members that was not necessarily captured in our survey. However, several programs chose to provide commentary, which was shared as it was applicable to IPPEs in this manuscript. Third, incomplete survey responses did alter the denominators when calculating percentages. The authors attempted to clarify these differences when they were presented in this article. Interestingly, only 51/75 institutions responded to items related to IPPEs in psychiatry and neurology. One must consider the possibility that the 24 institutions with no responses to these items may have left this section of the survey incomplete if IPPEs in these settings are not offered at their institution. Of course, this cannot be stated definitively, but it is possible this manuscript actually overestimates the percentage of programs offering IPPEs in these areas. Fourth, 17.6% of survey respondents were unable to assess if their institution needed to increase psychiatry and neurology IPPEs. The authors feel this further emphasizes the need to address the importance of board certified psychiatric pharmacists and their role in the training of student pharmacists in these practice areas.

To help promote and encourage expansion of these learning opportunities for all the reasons listed above, the following examples have been provided by the authors regarding potential IPPEs in psychiatry and neurology.

Example IPPE at the University of Michigan College of Pharmacy

During the third year of pharmacy school, students engage in conducting telephone-based medication reconciliation 4 hours per week over a 12-week rotation. The goal is for students to obtain an accurate and complete medication history while gaining exposure to patients with psychiatric illness, employing empathy, and strengthening communication skills. Under the supervision of a preceptor, students contact new patients who are referred to an outpatient psychiatry clinic to gather information about prescription medications, over-the-counter medications, herbal or dietary supplements, affordability, adherence, and any patient concerns regarding medication use. This information is available to the team for review in the patient's electronic medical record. Through this initiative, improvements in the accuracy of patients' medication lists as well as the satisfaction of providers is being assessed, and initial data demonstrate a positive impact on both outcomes.

Students spearhead development and modifications to the note template, training materials, and education and training of new IPPE students. Between patient calls, students often research and prepare responses to drug

information inquiries or work on projects related to improving the care of psychiatric patients.

Because IPPEs are not year-round, to facilitate consistent service coverage, a team of volunteers assists with patient phone calls over holidays, breaks, and the summer. Introductory pharmacy practice experiences students and the volunteer team are essential to successful implementation and sustainability of this pharmacy service in ambulatory psychiatry.

Example IPPE at The University of Texas at Austin College of Pharmacy

During the summer between the second and third year of pharmacy school, students participate in a 120-hour (3 weeks, full time) institutional IPPE. The primary goal of these rotations is to introduce students to the fundamentals of pharmacy practice in a hospital setting. Under the supervision of a preceptor, the students (1) participate in medication order processing, (2) demonstrate basic use of unit dose system and intravenous admixture system, (3) articulate current institutional pharmacy standards of practice, (4) participate in a medication safety exercise, and (5) demonstrate cultural and social competency.

The site for the institutional IPPE is completed at the only freestanding psychiatric facility in an 11-hospital network in central Texas. Students are exposed to patients with psychiatric illnesses through a variety of opportunities: (1) rounds on the inpatient units with a postgraduate year 2 psychiatric pharmacy resident, (2) participation in child and adolescent psychiatry treatment team meetings, (3) observing electroconvulsive therapy, and (4) observing group therapy.

Several topic discussions are arranged throughout the experience, including topics on medication safety, accreditation, pharmacy operations, drug information, and communication. Students also have the opportunity to attend a Network Behavioral Health Council meeting or patient safety committee meetings. Each student is also required to select a project to complete during the rotation, such as development of patient education materials to be used during the medication education classes provided for patients. Students are able to complete intravenous admixture training at an affiliated hospital within the health system.

Example IPPE at the University of Colorado Anschutz Medical Campus–Skaggs School of Pharmacy and Pharmaceutical Sciences

The Skaggs School of Pharmacy and Pharmaceutical Sciences has several IPPE programs, 2 of which are listed below.

The traditional second- and third-year IPPE program is a health systems mentoring program and is completed during the second-year spring and third-year fall semesters. The goal of this program is to provide a general understanding of health systems practice. The program lasts 1 year, and the students have specific application assignments. It is mentored by direct supervision or may be delegated to other personnel within the institution. One example of this program is embedded within a didactic course in neurology and psychiatry, which allows students to choose a specific application IPPE activity. The activities are as follows: antiepileptic drug interaction assessment and reflection, opioid pain conversion real-world application and experience, pain assessment identifying a patient with their preceptor, and a minimal state examination completed with their preceptor. All 160 second-year pharmacy students need to complete 4 activities overseen by assigned preceptors. These activities are designed to reinforce knowledge learned within the class sessions and to practice application of knowledge and skills within the experiential sites.

The Own Choice program, created by the Skaggs School of Pharmacy and Pharmaceutical Sciences experiential office, offers students an opportunity to explore and tailor their education and career goals. It is a large component of the experiential program, spanning 3 semesters of the introductory pharmacy practice experiences. Students select an area in pharmacy of their choice, are paired with a preceptor, and spend time visiting the site, meeting with the preceptors (licensed health care practitioners), and providing pharmacy services. The school encourages students to engage in the community and seek out their own opportunities in unique practice settings. Students must engage for a minimum of 3 hours in a health system/hospital setting, a community engagement activity (health fair, immunization clinic), and a public health activity. Own Choice activities can take place throughout the state of Colorado.

Conclusion

Our survey results demonstrate a majority of academic institutions and individual respondents do not offer IPPEs in psychiatry and even fewer offer IPPEs in neurology. To increase availability of these experiences, it is important to realize IPPE students can be successfully integrated into both inpatient and outpatient psychiatry and neurology practices as illustrated in the examples provided. Opportunities exist for pharmacists to develop or optimize IPPEs in these areas, and the authors challenge schools and colleges of pharmacy to explore implementation of these critical experiences. This should be considered in the context of an opportunity to expand and support pharmacy services as well as institutional goals. Increased involvement in

precepting and increased numbers of IPPEs in all areas of psychiatry and neurology are suggested to build skills and knowledge, benefiting both institutions and students. Students can gain insight into future careers in psychiatric and neurologic pharmacy and have a greater understanding of the stigma these populations face, ultimately benefiting the patients they serve.

References

1. Standards 2016: Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree: "Standards 2016" [Internet]. Chicago: Accreditation Council for Pharmacy Education [updated 2015 Feb 2; cited 2016 Jul 17]. Available from: <https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf>
2. Standards 2007: Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree [Internet]. Chicago: Accreditation Council for Pharmacy Education [updated 2006 Feb 17; cited 2016 Jul 17]. Available from: https://www.acpe-accredit.org/pdf/s2007guidelines2.o_changesidentifiedinred.pdf
3. Jacoby A, Snape D, Baker GA. Epilepsy and social identity: the stigma of a chronic neurological disorder. *Lancet Neurol*. 2005; 4(3):171-8. DOI: [10.1016/S1474-4422\(05\)70020-X](https://doi.org/10.1016/S1474-4422(05)70020-X). PubMed PMID: [15721827](https://pubmed.ncbi.nlm.nih.gov/15721827/).
4. Dipaula BA, Qian J, Mehdizadegan N, Simoni-Wastila L. An elective psychiatric course to reduce pharmacy students' social distance toward people with severe mental illness. *Am J Pharm Educ*. 2011;75(4):72. DOI: [10.5688/ajpe75472](https://doi.org/10.5688/ajpe75472). PubMed PMID: [21769148](https://pubmed.ncbi.nlm.nih.gov/21769148/).
5. O'Reilly CL, Bell JS, Kelly PJ, Chen TF. Impact of mental health first aid training on pharmacy students' knowledge, attitudes and self-reported behaviour: a controlled trial. *Aust N Z J Psychiatry*. 2011;45(7):549-57. DOI: [10.3109/00048674.2011.585454](https://doi.org/10.3109/00048674.2011.585454). PubMed PMID: [21718124](https://pubmed.ncbi.nlm.nih.gov/21718124/).
6. Gable KN, Muhlstadt KL, Celio MA. A mental health elective to improve pharmacy students' perspectives on mental illness. *Am J Pharm Educ*. 2011;75(2):34. DOI: [10.5688/ajpe75234](https://doi.org/10.5688/ajpe75234). PubMed PMID: [21519423](https://pubmed.ncbi.nlm.nih.gov/21519423/).
7. Bamgbade BA, Ford KH, Barner JC. Impact of a mental illness stigma awareness intervention on pharmacy student attitudes and knowledge. *Am J Pharm Educ*. 2016;80(5):80. DOI: [10.5688/ajpe80580](https://doi.org/10.5688/ajpe80580). PubMed PMID: [27402983](https://pubmed.ncbi.nlm.nih.gov/27402983/).
8. Thornicroft G, Mehta N, Clement S, Evans-Lacko S, Doherty M, Rose D, et al. Evidence for effective interventions to reduce mental-health-related stigma and discrimination. *Lancet*. 2016; 387(10023):1123-32. DOI: [10.1016/S0140-6736\(15\)00298-6](https://doi.org/10.1016/S0140-6736(15)00298-6). PubMed PMID: [26410341](https://pubmed.ncbi.nlm.nih.gov/26410341/).
9. Dopheide JA, Bostwick JR, Goldstone LW, Thomas K, Nemire R, Gable KN, et al. Curriculum in psychiatry and neurology for pharmacy programs. *Am J Pharm Educ*. 2017;81(7):5925. DOI: [10.5688/ajpe8175925](https://doi.org/10.5688/ajpe8175925). PubMed PMID: [29109559](https://pubmed.ncbi.nlm.nih.gov/29109559/).
10. American Academy of Neurology. Compelling statistics [cited 2016 Nov 1]. Available from: https://www.aan.com/uploadedFiles/Website_Library_Assets/Documents/6.Public_Policy/1.Stay_Informed/4.Public_Policy_Resources/compell.pdf
11. Mort JR, Johnson TJ, Hedge DD. Impact of an introductory pharmacy practice experience on students' performance in an advanced practice experience. *Am J Pharm Educ*. 2010;74(1):11. DOI: [10.5688/aj740111](https://doi.org/10.5688/aj740111). PubMed PMID: [20221362](https://pubmed.ncbi.nlm.nih.gov/20221362/).
12. Sylvia LM. An advanced pharmacy practice experience in academia. *Am J Pharm Educ*. 2006;70(5):97. DOI: [10.5688/aj700597](https://doi.org/10.5688/aj700597). PubMed PMID: [17149426](https://pubmed.ncbi.nlm.nih.gov/17149426/).
13. Galinski CN, Horosz PJ, Spooner JJ, Kennedy DR. Comparison of introductory pharmacy practice experiences among US pharmacy programs. *Am J Pharm Educ*. 2014;78(9):162. DOI: [10.5688/ajpe789162](https://doi.org/10.5688/ajpe789162). PubMed PMID: [26056401](https://pubmed.ncbi.nlm.nih.gov/26056401/).