BRIEF
Impostor Phenomenon in Undergraduate and Doctor of Pharmacy Students at a Small Private University
Dylan McWilliams, Mitchell Block, Jessica Hinson, PharmD, Karen L. Kier, PhD, MSc
Ohio Northern University, Raabe College of Pharmacy, Ada, Ohio
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Objective. The purpose of the study was to observe the prevalence of impostor phenomenon among students attending Ohio Northern University and to assess secondary factors that impact the severity of this phenomenon.

Methods. Using the validated Clance Impostor Phenomenon Scale, the incidence of impostor phenomenon was assessed at Ohio Northern University. We hypothesized that students enrolled in the Ohio Northern University College of Pharmacy would demonstrate more intense levels of impostor phenomenon than students enrolled in other majors within the university.

Results. Of the approximately 3100 students at the university, 391 students (12.6%) completed the survey and qualified for the study. Students for this study were recruited via email. This method was used for two reasons; it was the best way to reach the entirety of the student body, and, at the time of the study, students were transitioning from campus to home due to the COVID-19 pandemic. Out of a total possible score of 100, all colleges scored an average impostor phenomenon score between 68 and 75. These scores were interpreted as “frequently experiences impostor feelings.” No significant differences in scores were found by college, gender, ethnicity/race, year in school, or specific major.

Conclusion. Impostor phenomenon is common at Ohio Northern University and does not discriminate by college, age, gender, race/ethnicity, year in school, or academic major. There is a need for external intervention to educate students on the impact of impostor phenomenon and to reduce this impact. Interventions should be targeted to all students enrolled at the university regardless of educational program or other demographics.

Keywords: impostor phenomenon, impostor syndrome

INTRODUCTION
Impostor phenomenon, also referred to as impostor syndrome, occurs in high-achieving individuals with difficulty internalizing and accepting successes. Impostor phenomenon was originally described by Clance and Imes in 1978 in high-achieving women.1 It has since been accepted that impostor phenomenon can affect any individual regardless of demographic factors. Individuals with impostor phenomenon often attribute their successes to chance or luck rather than hard work and ability. Many individuals with impostor phenomenon often attribute their successes to chance or luck rather than hard work and ability. Many individuals with impostor phenomenon do not feel they deserve their own accomplishments and fear others will eventually view them as a fraud.2 Individuals suffering from impostor phenomenon internally struggle to accept positive feedback and dismiss accolades due to the misconception that those around them have a falsely high impression of their abilities.3

Impostor phenomenon has been linked with negative mental health outcomes. Individuals with impostor phenomenon may feel that anything short of perfection is failure, success that requires hard work and perseverance lacks authenticity, successes that use resources or a team approach is not valid, and the inability to juggle numerous responsibilities without setbacks is failure.3,4 These feelings create a detrimental circular model of perceived failure, anxiety, and need for perfection. Previous studies have linked impostor phenomenon to depression, anxiety, perfectionism, and low self-esteem.4-7 Those with impostor phenomenon usually suffer quietly to not unmask themselves as frauds, but the topic has become more public in recent years as notables such as Natalie Portman, Sheryl Sandberg, and Justice Sonia Sotomayor have spoken out regarding their struggles with impostor phenomenon.8,9

Research has evaluated impostor phenomenon in students pursuing careers in medicine, dentistry, nursing, and
Two decades of research have demonstrated a high level of impostor phenomenon among health professionals and students, and the literature shows that impostor phenomenon is more common in high-achieving and high-IQ individuals. A significant amount of national and international literature has investigated impostor phenomenon in medical students and residents. These studies have found that impostor phenomenon is prevalent and consistently higher in females than males. Impostor phenomenon has been correlated with depression, anxiety, and stress, and individuals with impostor phenomenon experience higher rates of professional burnout than those without it. Longitudinal studies among medical students have demonstrated that impostor phenomenon gets worse over time (scores increase) as students gain more knowledge and training, but other wellness criteria, such as professional identity, wellness, and professional calling, tend to improve. Similar trends have been found among dental students, chiropractic students, nursing students, and veterinary practitioners.

Although many studies have described impostor phenomenon within the health professions, few have evaluated pharmacy students. A 1998 study from the Medical College of South Carolina included pharmacy students and found high rate of impostor phenomenon within a small sample. Henning and colleagues evaluated 477 students in medicine, dentistry, nursing, and pharmacy, assessing impostor phenomenon with the Clance Impostor Phenomenon Scale (CIPS). This study correlated psychological distress and perfectionism with feelings of impostor phenomenon. Pharmacy students reported the highest level of psychological distress at a rate of about 50%. The authors recommended that health professions students could benefit from screening and evaluation for intervention programs that improve impostor phenomenon feelings. Thirty years later, Boyle and colleagues evaluated impostor phenomenon in Doctor of Pharmacy (PharmD) students and pharmacy faculty at two colleges of pharmacy using CIPS. The overall mean CIPS score for respondents was 63.8 (out of a total 100 points) with a standard deviation of 15.1; for students the mean was 64.3, and for faculty it was 61.2. A cross-sectional study evaluated the prevalence of impostor phenomenon in pharmacy postgraduates who were first- or second-year residents. Most of the survey respondents were first-year residents, female, and single with no children. The mean CIPS score for respondents was 64 with a standard deviation of 15. The study did not find a significant difference in CIPS scores between males and females. The researchers concluded that pharmacy residents display a high level of impostor phenomenon with a significant level of distress that warrants further investigation on personal and professional well-being.

Literature that describes interventions to improve impostor phenomenon has been published in other fields but has not been studied in pharmacy. In one study, a workshop was designed to improve impostor phenomenon in medical professionals, including students, residents, fellows, faculty, staff, and program leadership. The workshop was successful in opening a dialog on effective strategies to address impostor phenomenon at the individual, peer, and institutional levels. The workshop created suggestions for improving impostor phenomenon and for removing barriers to improvement, and it also evaluated the usefulness of the day for the participants. A one-day workshop for clinical nurse specialists provided a means to engage and discuss reasons for high impostor phenomenon among nurses. The program was designed to help those with impostor phenomenon feel empowered and to provide strategies to reduce impostor feelings. The workshop evaluations indicated this was a valuable experience.

Due to limited literature regarding the prevalence and impact of impostor phenomenon in pharmacy students, this research focused on evaluating the prevalence of impostor phenomenon in pharmacy students who attend a private college of pharmacy and then comparing the data to students from five other colleges on campus. Specifically, this study aimed to quantify the prevalence of impostor phenomenon among students attending Ohio Northern University. Secondary objectives included determining prevalence of impostor phenomenon by student age and gender. Another secondary objective was to compare students’ mean CIPS scores between the five colleges.

**METHODS**

Ohio Northern University includes five colleges: Arts and Sciences, Business Administration, Engineering, Law, and Pharmacy. All colleges except the College of Law enroll undergraduate students. The College of Pharmacy is a “zero to six” program, which means it enrolls students directly from high school to achieve a PharmD in six years, and therefore, students can be classified as both undergraduate and graduate-level students depending on the year of training. The Clance Impostor Phenomenon Scale (CIPS; available at https://www.paulineroseclance.com/pdf/IPscoringtest.pdf), was distributed with permission to the campus from January 14, 2020, until February 14, 2020, by the electronic survey platform Qualtrics (Qualtrics International Inc). All students at the university were invited to participate through the university email system and were told they would receive information on their personalized impostor phenomenon score and how to
interpret the results. The interpretation criteria can be found in Table 1. Inclusion criteria for the study population included being ≥18 years old, enrolled as a current Ohio Northern University student, and proficient in English. All communications to the students about the survey, including the introduction to the survey itself, described that the survey in Qualtrics was completely anonymous with no identifiable information being tracked, this aimed to reduce the effect of social desirability bias. Before answering the survey questions, students were asked for demographic information, which is summarized in Table 2. Data were analyzed using SPSS Statistics version 27 (IBM Corp) statistical software. This study was deemed exempt by the Ohio Northern University Institutional Review Board. Descriptive and inferential statistics were used to evaluate the data. Descriptive statistics included frequencies, means, and standard deviations. An analysis of variance (ANOVA) with Tukey post hoc comparisons were performed to evaluate the mean CIPS scores for the five colleges. A t test compared mean scores between the College of Pharmacy and the other colleges combined as one group. A t test was used to compare the mean score results between male and female respondents.

RESULTS
Of the university’s approximately 3100 students, 391 (12.6%) completed the survey and qualified for the study. Survey collection occurred during a transition from on-campus to distance learning due to the COVID-19 pandemic, which limited the response rate due to external stress on the campus community. Survey results can be seen in Table 2. Out of a total score of 100 points on the scale, the mean score for all colleges was between 68 and 75. These scores can be interpreted as “frequently experiences impostor feelings.” The differences between the average scores of the colleges were not statistically significant, with $p = 0.29$ for the ANOVA test comparing all five colleges. When comparing the pharmacy college mean score with the mean score of the other colleges combined into one group, the $p$ value was also not statistically significant, at $p = 0.07$. The average impostor phenomenon scores by gender ($p = 0.76$) and by age ($p = 0.67$) were also found to lack statistical significance. An analysis was conducted to evaluate potential differences in mean scores by ethnicity/race and year in school, and no significant differences were found.

Table 1. Clance Impostor Phenomenon Scale Scoring Criteria Description

<table>
<thead>
<tr>
<th>Score</th>
<th>Meaning of score</th>
</tr>
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<tbody>
<tr>
<td>≤40</td>
<td>Few impostor characteristics</td>
</tr>
<tr>
<td>41-60</td>
<td>Moderate IP experiences</td>
</tr>
<tr>
<td>61-80</td>
<td>Frequently experiences impostor feelings</td>
</tr>
<tr>
<td>&gt;80</td>
<td>Often has intense IP experiences</td>
</tr>
</tbody>
</table>

Abbreviations: IP = impostor phenomenon

Table 2. Participant Demographics and Average Impostor Phenomenon Scores Reported per Specific Demographics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean (%) frequency&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Average IP&lt;sup&gt;b&lt;/sup&gt;</th>
<th>No. of responses scoring &lt;40</th>
<th>No. of responses scoring &gt;80</th>
<th>$p$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.76</td>
</tr>
<tr>
<td>Female</td>
<td>262 (67.0)</td>
<td>69</td>
<td>8</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>125 (32.0)</td>
<td>69</td>
<td>2</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>4 (1.0)</td>
<td>78</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.67</td>
</tr>
<tr>
<td>18-21</td>
<td>275 (70.3)</td>
<td>70</td>
<td>2</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>22-25</td>
<td>96 (24.6)</td>
<td>67</td>
<td>2</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>26-29</td>
<td>9 (2.3)</td>
<td>74</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>&gt;30</td>
<td>9 (2.3)</td>
<td>70</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>College</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.29</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>189 (48.3)</td>
<td>68</td>
<td>8</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Arts and Sciences</td>
<td>113 (28.9)</td>
<td>71</td>
<td>0</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>55 (14.1)</td>
<td>70</td>
<td>0</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>20 (5.1)</td>
<td>68</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Law</td>
<td>11 (2.8)</td>
<td>75</td>
<td>0</td>
<td>5</td>
<td></td>
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</tbody>
</table>

Abbreviations: IP = impostor phenomenon
<sup>a</sup> Overall sample size = 391 students
<sup>b</sup> Overall average IP score = 69
DISCUSSION

Overall, the average impostor phenomenon score for all students was 69.27. According to CIPS, this score is indicative of “frequently experiencing impostor feelings.” Roughly 48% of participants in this study were pharmacy students, which represent a quarter of the student population attending the university. The mean impostor phenomenon score for student pharmacists was 67.99. This is similar to recent findings from Boyle and colleagues, which found an overall mean impostor phenomenon score of 63.8 for pharmacy students and faculty at two colleges of pharmacy. Both studies indicate that pharmacy students are “frequently experiencing impostor feelings.”

Similar studies in other health professions have frequently found that women have higher impostor phenomenon scores than men. While the study by Boyle and colleagues did not evaluate differences by gender, our study did so, but we found no significant difference according to gender. Given these findings, one could hypothesize that the strenuous curriculum associated with pharmacy is a prominent factor that accounts for no significant difference by gender. In comparison to other health professions studies, our study explored additional factors. Other health professions studies, including the Boyle study, did not compare pharmacy students to other students on campus with different majors. Our study found no difference in impostor phenomenon among colleges. This may be because our study involved students at private university with rigorous programs. This information is consistent with impostor phenomenon being present at high levels in undergraduate programs with talented undergraduates, as studied by Lee, who found an undergraduate impostor phenomenon mean of 64.2 with a standard deviation of 14.4. This score is interpreted as a moderate level of impostor phenomenon and is consistent with both the Boyle study and our study including pharmacy students as well as other majors.

Our hypothesis was that students in the College of Pharmacy would have a higher CIPS score than students in other undergraduate colleges and law programs. We failed to prove this hypothesis, and more research needs to be conducted to identify causation of impostor phenomenon in students. One limitation of this study was the lack of diversity in the university population. Most students sampled were of similar age and were from similar ethnic groups. Most health care impostor phenomenon studies lack diversity in terms of the study populations. Another limitation was the potential for a nonresponse bias. We attempted to minimize nonresponse bias by allowing a one-month time frame for responses. A statistical comparison was performed on the mean CIPS scores of early responders compared to late responders, and no statistically significant difference was found between responses (p = 0.887). The study was also limited by the survey being distributed to students at a single private university. The study results may not have external validity to be applicable to campuses of other types.

Partnerships with other institutions to increase sample size and improve diversity could evaluate the impact of impostor phenomenon in diverse populations. With a larger and more diverse population, one could explore the rates of impostor phenomenon among first-generation and non–first-generation students. Future studies are needed to improve students’ confidence in their knowledge and to prepare them for careers while finding ways to reduce impostor phenomenon. Next steps include focus groups on the impact of impostor phenomenon and the impact of methods, if any, that have been used to alleviate associated stress. Ultimately, we aim to work with the university to formulate a response to assist students in managing impostor phenomenon.

CONCLUSION

This research found that impostor phenomenon is common in Ohio Northern University students and does not discriminate by college, age, gender, race/ethnicity, year in school, or academic major. There is a need for intervention and education on the impact of impostor phenomenon and to reduce its related stresses on students. Interventions should be targeted to all students enrolled regardless of educational program or demographics.

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REFERENCES