BRIEF

General Anxiety, Academic Distress and Family Distress Among PharmD Students

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Objective. To examine the prevalence of general anxiety (GA) among the pharmacy students and the role of academic distress and family distress.

Methods. A cross-sectional study was conducted among first, second, and third year Doctor of Pharmacy (PharmD) students. All students received an online survey consisting of the Counseling Center Assessment of Psychological Symptoms-62 (CCAPS-62) questionnaire and sample characteristics. Variables from CCAPS-62 considered in this study included the GA, academic distress (AD) and, family distress (FD) measured on a three-level scale namely, no, low, and high clinical level. Data on gender, race, work status and physical activity were also collected. Descriptive and multinomial logistic regression were conducted to identify factors associated with GA.

Results. Of the 238 students who took the online survey (63% response rate), the majority were female (67%) and Asian (49%). Overall, 69 first year, 75 second year and 94 third year students participated. The prevalence of GA was 50% with equal distribution (25% each) among high-clinical and low-clinical GA groups. High AD and high FD was associated with a greater probability of high GA.

Conclusion. GA was quite prevalent among pharmacy students. Identification and implementation of strategies to lower GA as well as AD is of great importance. Also, understanding and enhancing the family members’ role in students’ lives is essential. College administrators can provide support for students as well as for family members to make improvements in these areas.

Keywords: general anxiety, PharmD, academic distress, family distress, pharmacy student

INTRODUCTION

High levels of stress and anxiety among the students of professional programs including pharmacy, medical and dentistry. At least one out of three college students reported their academic performance being impacted by their anxiety level. Besides, high level of anxiety, has a negative impact on other aspects of students’ lives and can lead to more severe psychological problems including depression and suicide. Particularly, pharmacy students are usually under rigorous academic pressure and have a very short leisure time if any. High academic pressure and lack of time for self-care, accompanied by high stress level from the course work, can impact pharmacy students’ quality of life. Despite the gradual learning of coping skills to face anxiety, studies on medical students have shown that higher levels of maturity and a higher number of years in school is not associated with a lower anxiety level. Supporting this finding, another study reported a higher level of stress among the third and fourth-year pharmacy students. Pharmacy students when compared to the general campus students were also found to have significantly higher levels of general anxiety (GA).

Prevalence of GA among pharmacy students has not been evaluated extensively in the past. It is known that clinical GA is more common among PharmD students (46.1%) compared to general campus population (35.6%) at the same university. Fischbein and Bonfine compared pharmacy students and medical students from 23 institutions in the United States. They found that clinical GA among pharmacy students is 2 times more common compared to medical students. Knowing the magnitude of the problem, it is still not clear what factors contribute towards GA among PharmD students.

A study in France on graduate students showed that students with higher levels of perceived academic pressure have 2 times more chance of high anxiety levels. In the US, analysis of data from the Center for Collegiate Mental Health 2013–2014 database about college students’ anxiety indicated that academic distress is responsible for most of the variance in anxiety. They found that family distress was at the third place after financial stress among other factors associated with anxiety. Based on the available evidence, it seems that the extensive pharmacy curriculum, namely
academic distress (AD) and factors closer to the students’ family life, namely family distress (FD) might play important roles in students’ GA level.

Understanding these factors as well as which sample characteristics are associated with a higher level of GA among pharmacy students may help faculty and administrators develop better interventions.\textsuperscript{1,18-21} Our objective was to examine the prevalence and the level of GA among pharmacy students and assess if there is any relationship between academic distress (AD) and family distress (FD) with GA after adjusting for race, gender, work status and physical activity.

METHODS

In this cross-sectional study, all first, second, and third-year PharmD students from the College of Pharmacy were invited to participate in the study. Invitations were sent through an email by the end of the Spring semester during April 2020. The fourth-year students were not included in this study due to their busy schedule with residency applications and interviews. The invitation email was sent by the program director through a listserv and included a link to an anonymous online survey. The survey was available for 2 weeks. To increase the response rate, all students received reminder emails 5 and 10 days after the first email. Participation was voluntary and there were no incentives offered. The study protocol was approved by the Institutional Review Board.

The survey included the Counseling Center Assessment of Psychological Symptoms instrument (CCAPS-62) along with demographic questions. The CCAPS-62 questionnaire is validated with high consistency and internal validity by the Counseling & Psychological Services at the University of Michigan.\textsuperscript{22,23} CCAPS-62 consists of 62 statements which were not modified and used to assess three subscales used in this study including GA, AD and, FD.\textsuperscript{23} The GA construct consisted of 9 statements such as "There are many things I am afraid of" and "My heart races for no good reason". The AD construct consisted of 5 statements such as "I feel confident that I can succeed academically" and "It’s hard to stay motivated for my classes". The FD construct consisted of 6 questions including "I get sad or angry when I think of my family" and "My family gets on my nerves". The level of agreement to the statements were on a Likert scale from 0 (not at all like me) to 4 (exactly like me) and students were asked to rank how close they felt to the description given for each item given during the last two weeks. According to the CCAPS-62 2019 manual, raw scores for all subscales were calculated by adding the scores of the questions in each subscale and dividing by the number of questions. Raw scores were then categorized into three groups according to the CCAPS-62 manual 2019. Based on the manual, the no-clinical (also known as “low”) group consists of students who report no, or minimal distress in each area. The low-clinical (also known as “moderate”) group includes students with moderate distress in each area and further assessment is recommended for them. The high-clinical (also known as “elevated”) group consists of students with high levels of distress that should be further assessed for diagnosis.\textsuperscript{22,23} The cut points for GA were 1.22 and 1.89. The cut points for AD were 1.2 and 2.4. The cut points for FD were 1.31 and 1.83.\textsuperscript{15}

The demographic characteristics included students’ gender, race, and the students’ year in pharmacy school (P1/P2/P3). Due to limited numbers of students in African American, Hispanic, and Native American groups at this institution, race was categorized as Asian, White, and Others. The work status of students was determined by a yes/no question and it was included in the survey due to the potential negative effect of work-life balance on the students’ anxiety level.\textsuperscript{20,24} The other factor evaluated was students’ exercise habits with two different options including never/occasionally or at least 2-3 times per week.

Data analysis was conducted using SAS 9.4 (SAS Institute Inc., Cary, NC). Due to the asymmetrical distribution of the GA, AD and FD, a gamma distribution instead of a normal distribution was assumed and generalized linear models were used. As such, all associations were tested as a series of univariate regressions. Multinomial logistic regression for the 3 categories of GA with the above-mentioned variables was carried out to examine which factors were associated with GA. Values were considered significant at a p-value of <.05.

RESULTS

Out of 377 students invited for the study, 238 students responded. The overall response rate was 63% and it was respectively 68%, 66%, and 55% for P3, P2, and P1 students. Majority of the students were female (67%) and Asian (49%). A summary of the participants’ characteristics is provided in Table 1. Among the students, 24.37% indicated high-clinical GA and 25.21% indicated low-clinical GA. Rate of GA was not significantly different by race, working status or year of enrolment (Table 1).

GA levels differed significantly by gender, AD level, FD level and by physical activity performed (Table 1). High-clinical GA and low-clinical GA were both significantly greater among female students respectively (27.5% vs
17.95% p value<.05) and (28.75% vs 17.95% p value<.05). The distribution of AD and FD were significantly different among different groups of GA respectively (p<.0001, p<.05).

Results of unadjusted multinomial logistic regression (Table 2) indicated a greater probability of high-clinical GA among students with high-clinical AD (OR=58.46 95%CI 12.14-281.51). Students with low-clinical AD also had a greater probability of high-clinical GA (OR=21.42 95%CI 4.89-93.8). High-clinical FD was also associated with a greater probability of high-clinical GA (OR=5.33 95%CI=2.16-13.17). Female students had a higher probability of having GA, both low-clinical GA (OR=2.35 95%CI 1.17-4.72) and high-clinical GA (OR=2.25 95%CI 1.11-4.53). Occasionally or never doing exercise, was also associated with a higher probability of low-clinical GA (OR=2.18 95%CI 1.16-4.13).

Due to small sample size in low-clinical FD and AD, we converted GA, FD and AD into “clinical” and “not-clinical” (binary) variables by combining the low-clinical and high-clinical observations into the clinical group. To evaluate the interactive role of associated factors found significant previously, an adjusted binomial logistic regression was carried out. Gender, work status, physical activity, FD and AD were included in the model. Two predictive factors were found to be associated with a greater probability of high-clinical GA. The results of adjusted binomial logistic regression (Figure 1) indicated that after controlling for confounders a greater probability exhibiting clinical GA among students with clinical AD (OR=4.12 95%CI 2.21-7.67). Similarly, FD was also associated with a higher probability of clinical GA (OR=2.14 95%CI 1.1-4.26) after controlling for confounders.

DISCUSSION

The current study found prevalence of GA as high as 50% among pharmacy students, with 25% exhibiting high-clinical GA level. We found gender, physical activity, AD and FD as significant factors associated with GA. After adjusting for common confounders, we found that the effect of clinical AD and clinical FD was persistent, and they are associated with clinical GA.

The first demographic factor evaluated was gender. We found a higher rate of GA both low-clinical GA and high-clinical GA among female students. Several studies have found the same association of female gender and a higher level of GA among pharmacy and non-pharmacy students.\(^1\)\(^,\)\(^2\)\(^,\)\(^8\)\(^,\)\(^9\) The second factor evaluated was physical activity. Similar to the Feltz-Cornelis and colleagues’ study and the study by Xiang and colleagues, our data suggested an association between low physical activity and low-clinical GA (Table 2).\(^1\)\(^,\)\(^2\)\(^,\)\(^8\)\(^,\)\(^9\) However, contrary to these studies, we did not see any association between low physical activity and high-clinical GA.\(^2\)\(^,\)\(^8\)\(^,\)\(^9\) Our study suggests that the protective effect of physical activity is limited to low-clinical GA but not high-clinical GA.

Like previous studies, we found that high AD is associated with high GA.\(^1\)\(^,\)\(^2\)\(^,\)\(^3\)\(^1\) We found that students with high AD are at a 4 times higher chance of exhibiting GA (Figure 1). In support of our findings, in a study of pharmacy students, the most important triggers of stress were related to curriculum causing higher AD.\(^3\)\(^0\) Another study of medical students found the highest level of anxiety among the students using linear regression.\(^2\) This higher level of anxiety, has been attributed to the lack of adjustment to the new academic environment.\(^3\)\(^1\) Contrary to their findings, we did not find any significant difference between P1, P2 and P3 students in terms of GA.

Our findings further indicate that students with clinical FD have a higher probability of clinical GA. A previous study had found a significantly higher level of FD among female pharmacy students compared to the general campus population.\(^1\) However, they did not detect any association between FD and GA most likely as they only evaluated univariate relationships.\(^1\) In our study, by controlling other confounding factors, we were able to reveal the association of FD with GA. Our results support the previous study that has identified family issues as one of the main anxiety triggers among pharmacy students after other academic-related factors leading to GA.\(^2\)\(^7\)

There were some limitations in our study. The first limitation is our cross-sectional study design which does not let us make any causal interpretation. Second, the students’ age and their baseline psychiatric and medical history were not collected due to being classified as personal information. On the other hand, there might be differences in the students’ racial distribution as well as working status that can affect the generalizability of our findings. Also, with 63% participation rate, our study was not immune to a response bias. Another limitation of our study was the fact that our study was conducted at only one institution and curriculum across pharmacy colleges do differ, thus, the associations of AD should be considered with perspective. Finally, despite the possibility that COVID-19 pandemic issues could have affected our result, an analysis comparing previous data from the fall 2019 with the spring 2020 of only P2, and P3 students did not show any effect.

CONCLUSION

Paying attention to anxiety among students is of great importance to improve their academic performance. This study demonstrated a high rate of general anxiety among PharmD students. Clinical AD and clinical FD had significant...
association with clinical GA level. College administrators can provide support for students as well as for family members to make improvements in these areas.

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Table 1. Students’ Characteristics and GA

| Variable                        | No-Clinical GA | Low-Clinical GA 60(25.21) | High-Clinical GA 58(24.37) | Total | P value |
|---------------------------------|----------------|---------------------------|---------------------------|-------|---------|
| Gender                          |                |                           |                           |       |         |
| Female, n (%)                   | 70 (43.75)     | 46 (28.75)                | 44 (27.50)                | 160   | <0.05   |
| Male, n (%)                     | 50 (64.10)     | 14(17.95)                 | 14(17.95)                 | 78    |         |
| Race                            |                |                           |                           |       |         |
| Asian, n (%)                    | 51 (43.96)     | 33 (28.45)                | 29 (21.24)                | 116   | 0.22    |
| White, n (%)                    | 40 (57.14)     | 18 (25.21)                | 14(17.95)                 | 70    |         |
| Others, n (%)                   | 29 (55.77)     | 9 (17.31)                 | 14 (26.92)                | 52    |         |
| Academic distress               |                |                           |                           |       |         |
| High clinical, n (%)            | 12 (27.91)     | 8 (18.60)                 | 23 (53.49)                | 43    | <0.0001 |
| Low Clinical, n (%)             | 47 (41.23)     | 34 (29.82)                | 33 (28.95)                | 114   |         |
| No clinical, n (%)              | 61 (75.31)     | 18 (22.22)                | 2 (2.47)                  | 81    |         |
| Family distress                 |                |                           |                           |       |         |
| High Clinical, n (%)            | 9 (26.47)      | 9 (26.47)                 | 16 (47.06)                | 34    | <0.05   |
| Low Clinical, n (%)             | 9(40.90)       | 5 (22.73)                 | 8 (36.36)                 | 22    |         |
| No Clinical, n (%)              | 102 (56.04)    | 46 (25.27)                | 34 (18.68)                | 182   |         |
| Work status                     |                |                           |                           |       |         |
| Yes, n (%)                      | 75 (55.15)     | 32 (23.53)                | 29 (21.32)                | 136   | 0.23    |
| No, n (%)                       | 45 (44.12)     | 28 (27.45)                | 29 (28.43)                | 102   |         |
| Physical Activity               |                |                           |                           |       |         |
| At Least 2-3 Times/Week, n (%)  | 67 (59.29)     | 22 (19.47)                | 24 (21.24)                | 113   | <0.05   |
| Occasionally/Never, n (%)       | 53 (42.40)     | 38 (30.40)                | 34 (27.20)                | 125   |         |
| Year in pharmacy school         |                |                           |                           |       |         |
| P1, n (%)                       | 35 (50.72)     | 18 (26.09)                | 16 (23.19)                | 69    | 0.97    |
| P2, n (%)                       | 38 (50.67)     | 17 (22.67)                | 20 (26.67)                | 75    |         |
| P3, n (%)                       | 47 (50)        | 25 (26.60)                | 22 (23.40)                | 94    |         |

Table 2. Associations Between Pharmacy Student Characteristics and General Anxiety Level

| Variable                        | High Clinical General Anxiety | Low Clinical General Anxiety |
|---------------------------------|--------------------------------|--------------------------------|
|                                | Unadjusted OR (95% CI)         | p value                       | Unadjusted OR (95% CI)         | p value |
| High Clinical Academic Distress | 58.46(12.14-281.51)             | <.0001                        | 2.26(0.8-6.377)                | 0.12    |
| Low Clinical Academic Distress | 21.42(4.89-93.8)                | <.0001                        | 2.45(1.23-4.87)                | <0.05   |
| High Clinical Family Distress  | 5.33(2.16-13.17)                | 0.0003                        | 2.22(0.83-5.95)                | 0.11    |
| Low Clinical Family Distress   | 2.67(0.95-7.46)                 | 0.062                         | 1.23(0.39-3.88)                | 0.72    |
| Gender                         | 2.25 (1.11-4.53)                | 0.024                         | 2.35 (1.17-4.72)               | 0.017   |
| Work                           | 0.6 (0.32-1.13)                 | 0.11                          | 0.69 (0.37-1.28)               | 0.24    |
| Physical Activity              | 1.79 (0.95-3.38)                | 0.072                         | 2.18 (1.16-4.13)               | 0.016   |
| White                          | 0.48 (0.22-1.05)                | 0.064                         | 0.48 (0.34-1.41)               | 0.31    |
| Other races                    | 0.77 (0.35-1.67)                | 0.51                          | 0.48 (0.2-1.14)                | 0.1     |

Coding for categorical variables as follows: academic distress: 0=no-clinical AD 1=low-clinical AD 2=high-clinical AD, 1=high-clinical AD; family distress: 0=no-clinical FD 1=low-clinical FD 2=high-clinical FD; gender: 0=male, 1=female; work: 0=not working, 1=working; physical activity: 0=at least 2-3 times/week, 1=never or occasionally; race: 0=Asian, 1=White 2=Others; OR=odds ratio; CI=confidence interval.
Figure 1: Binomial Logistic Regression for Clinical General Anxiety and Associated Factors. Coding for categorical variables as follows: general anxiety: 0 = no-general anxiety, 1 = general anxiety; academic distress: 0 = no-AD, 1 = AD; family distress: 0 = no-FD, 1 = FD; Gender: 0 = male, 1 = female; Physical activity: 0 = at least 2-3 times/week, 1 = never or occasionally; GA = general anxiety; CI = confidence interval; OR = odds ratio.