BRIEF

General Anxiety, Academic Distress, and Family Distress Among Doctor of Pharmacy Students

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Objective. To examine the prevalence of general anxiety among Doctor of Pharmacy (PharmD) students and the role of academic distress and family distress in causing general anxiety.

Methods. A cross-sectional study was conducted among first, second, and third year 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 academic distress and family distress measured on a three-level scale: 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 general anxiety.

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 general anxiety was 50%, with equal distribution (25% each) among high-clinical and low-clinical general anxiety groups. High academic distress and high family distress were associated with a greater probability of a student having high general anxiety.

Conclusion. General anxiety was quite prevalent among pharmacy students. Identification and implementation of strategies to lower general anxiety as well as academic distress is of great importance. Also, understanding and enhancing the role of family members 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 occur among the students of professional programs including pharmacy, medical, and dentistry.[1-3] At least one out of three college students reported their academic performance had been impacted by their anxiety level.[4,5] Having a 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.[6] Pharmacy students in particular are usually under rigorous academic pressure and have very little if any leisure time.[7,8] High academic pressure and lack of time for self-care, accompanied by high level of stress from course work, can impact pharmacy students' quality of life.[9-12] Further, it was reported that medical students with higher levels of maturity and

higher number of years in school did not indicate lower anxiety level.[13] Supporting this finding, another study reported a higher level of stress among third and fourth year pharmacy students than among first and second year students.[14]

The prevalence of general anxiety among pharmacy students has not been evaluated extensively in the past. Clinical general anxiety is more common among PharmD students (46.1%) compared to general campus population (35.6%) at the same university.[1] Fischbein and Bonfine compared pharmacy students and medical students from 23 institutions in the United States and found that clinical general anxiety is two times more common among pharmacy students than among medical students.[15] Although we know the magnitude of the problem, what factors contribute to general anxiety among PharmD students is still not clear.

A study in France on graduate students showed that students with higher levels of perceived academic pressure were twice as likely to have high anxiety levels.[16] In the

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United States, analysis of data from the Center for Collegiate Mental Health 2013-2014 database about anxiety in college students indicated that academic distress is responsible for most of the variance in anxiety. They found that financial distress and family distress were the second and third factors most often associated with anxiety.[17] Based on the available evidence, it seems that academic distress and factors closer to the students' personal life, namely financial and family distress, play important roles in students' general anxiety level.

Understanding these factors, as well as which sample characteristics are associated with a higher level of general anxiety among pharmacy students, may help faculty and administrators develop better interventions.[1,18-21] Our objective was to examine the prevalence and level of general anxiety among pharmacy students and assess if there is any relationship between academic distress and/or family distress with general anxiety after adjusting for race, gender, work status, and physical activity.

METHODS

All first, second, and third professional year (P1, P2, and P3) PharmD students at the University of Houston College of Pharmacy were invited to participate in this cross-sectional study. An email invitation was sent to students by the end of the spring semester during April 2020. Fourth year students were not included in this study because of their demanding advanced pharmacy practice curriculum as well as 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 two weeks. To increase the response rate, all students received reminder emails five and 10 days after the first email was sent. 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 has been validated to have high consistency and internal validity by the Counseling and Psychological Services at the University of Michigan.[22,23] The CCAPS-62 consists of 62 statements which were not modified and used to assess three subscales used in this study including general anxiety, academic distress and, family distress.[23] The general anxiety construct consists of nine statements, such as "There are many things I am afraid of" and "My heart races for no good reason." The academic distress construct consisted of five statements, such as "I feel confident that I can succeed academically" and "It's hard to

stay motivated for my classes." The family distress construct consisted of six questions, including "I get sad or angry when I think of my family" and "My family gets on my nerves." Students indicated how close they felt to the descriptions given for each item during the last two weeks using a scale ranging from 0 = "not at all like me" to 4 = "exactly like me." According to the CCAPS-62 2019 manual, raw scores for all subscales were calculated by adding the student's scores on the questions in each subscale and dividing the total 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 group (also known as the "low group") consists of students who report no or minimal distress in each area. The low-clinical group (also known as the "moderate group") includes students with moderate distress in each area and further assessment is recommended for them. The high-clinical group (also known as the "elevated group") consists of students with high levels of distress that should be further assessed for diagnosis.[22,23] The cut points for general anxiety were 1.22 and 1.89. The cut points for academic distress were 1.2 and 2.4. The cut points for family distress were 1.31 and 1.83.[15]

The demographic characteristics included students' gender, race, and year in pharmacy school (P1, P2, or P3). Because of limited numbers of African American, Hispanic, and Native American students at this institution, race was categorized as Asian, White, and Other. The work status of students was included in the survey because of the potential negative effect of work-life balance on a students' anxiety level and determined by a yes/no question.[20,24] The other factor evaluated was students' exercise habits, for which two response options were given: "never/occasionally" or "at least two to three times per week."

Data analysis was conducted using SAS 9.4 (SAS Institute, Inc). Due to the asymmetrical distribution of general anxiety, academic distress, and family distress, 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 three categories of general anxiety with the above-mentioned variables was carried out to examine which factors were associated with general anxiety. Values were considered significant at $p < .05$.

RESULTS

Out of 377 students invited for the study, 238 students responded. The overall response rate was 63%, and the

Table 1. Characteristics Associated With General Anxiety in Doctor of Pharmacy Students, N = 238

Characteristic	No-Clinical General Anxiety (n = 120), N (%)	Low-Clinical General Anxiety (n = 60), N (%)	High-Clinical General Anxiety (n = 58), N (%)	Total, N	*p* value
Gender					<.05
Female	70 (43.8)	46 (28.8)	44 (27.5)	160	
Male	50 (64.1)	14 (18.0)	14 (18.0)	78	
Race					.22
Asian	51 (44.0)	33 (28.4)	32 (27.6)	116	
White	40 (57.1)	18 (25.7)	12 (17.1)	70	
Others	29 (55.8)	9 (17.3)	14 (26.9)	52	
Academic distress					<.001
High clinical	12 (27.9)	8 (18.6)	23 (53.5)	43	
Low clinical	47 (41.2)	34 (29.8)	33 (28.9)	114	
No clinical	61 (75.3)	18 (22.2)	2 (2.5)	81	
Family distress					<.05
High clinical	9 (26.5)	9 (26.5)	16 (47.1)	34	
Low clinical	9 (40.9)	5 (22.7)	8 (36.4)	22	
No clinical	102 (56.0)	46 (25.3)	34 (18.7)	182	
Work status					.23
Yes	75 (55.1)	32 (23.5)	29 (21.3)	136	
No	45 (44.1)	28 (27.4)	29 (28.4)	102	
Physical activity					<.05
At least 2-3 times/week	67 (59.3)	22 (19.5)	24 (21.2)	113	
Occasionally/never	53 (42.4)	38 (30.4)	34 (27.2)	125	
Year in pharmacy school					.97
P1	35 (50.7)	18 (26.1)	16 (23.2)	69	
P2	38 (50.7)	17 (22.7)	20 (26.7)	75	
P3	47 (50.0)	25 (26.6)	22 (23.4)	94	

response rates for P3, P2, and P1 students were 68%, 66%, and 55%, respectively. The majority of students were female (67%) and Asian (49%). A summary of the participants' characteristics is provided in Table 1. Among the students, 24.4% indicated high-clinical general anxiety and 25.2% indicated low-clinical general anxiety. Rate of general anxiety was not significantly different by race, working status, or year of enrolment (Table 1).

General anxiety levels differed significantly by gender, academic distress level, family distress level and amount of physical activity each week (Table 1). High-clinical general anxiety and low-clinical general anxiety were both significantly greater among female students than male students (27.5% vs 18.0%, respectively; *p* value < .05; and 28.8% vs 18.0%, respectively; *p* value < .05). Academic distress (*p* < .0001) and family distress (*p* < .05) were significantly different among different

groups of general anxiety, namely no-clinical, low-clinical, and high-clinical general anxiety.

Results of unadjusted multinomial logistic regression (Table 2) indicated a greater probability of high-clinical general anxiety among students with high-clinical academic distress (OR, 58.5 95% CI, 12.1-281.5). Students with low-clinical academic distress also had a greater probability of high-clinical general anxiety (OR, 21.4; 95% CI, 4.9-93.8). High-clinical family distress was also associated with a greater probability of high-clinical general anxiety (OR, 5.3; 95% CI, 2.2-13.2). Female students had a higher probability of having general anxiety, both low-clinical general anxiety (OR, 2.4; 95% CI, 1.2-4.7) and high-clinical general anxiety (OR, 2.3; 95% CI, 1.1-4.5). Occasionally or never doing exercise was also associated with a higher probability of low-clinical general anxiety (OR, 2.2; 95% CI, 1.2-4.1).

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

Variable	High Clinical General Anxiety Unadjusted OR (95% CI)	*p* value	Low Clinical General Anxiety Unadjusted OR (95% CI)	*p* value
High Clinical Academic Distress	58.5 (12.1-281.5)	<.0001	2.3 (0.8-6.4)	.12
Low Clinical Academic Distress	21.4 (4.9-93.8)	<.0001	2.4 (1.2-4.9)	<.05
High Clinical Family distress	5.3 (2.2-13.2)	.0003	2.2 (0.8-5.9)	.1
Low Clinical Family distress	2.7 (0.9-7.5)	.06	1.2 (0.4-3.9)	.7
Gender	2.3 (1.1-4.5)	.02	2.4 (1.2-4.7)	.02
Work	0.6 (0.3-1.1)	.1	0.7 (0.4-1.3)	.2
Physical Activity	1.8 (0.9-3.4)	.07	2.2 (1.2-4.1)	.02
White	0.5 (0.2-1.1)	.06	0.5 (0.3-1.4)	.3
Other races	0.8 (0.3-1.7)	.5	0.5 (0.2-1.1)	.1

Coding for categorical variables as follows: academic distress: 0=no-clinical academic distress, 1=low-clinical academic distress, 2=high-clinical AD, 1=high-clinical AD; family distress: 0=no-clinical family distress, 1=low-clinical family distress, 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.

Because of the small sample size in low-clinical family distress and academic distress, we converted general anxiety, family distress, and academic distress 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 previously found to be significant, an adjusted binomial logistic regression was carried out. Gender, work status, physical activity, family distress, and academic distress were included in the model. Two predictive factors were found to be associated with a greater probability of high-clinical general anxiety. The results of adjusted binomial logistic regression (Figure 1) indicated that after

controlling for confounders a greater probability exhibiting clinical general anxiety among students with clinical academic distress (OR, 4.; 95% CI, 2.2-7.7). Similarly, family distress was also associated with a higher probability of clinical general anxiety (OR, 2.1; 95% CI, 1.1-4.3) after controlling for confounders.

DISCUSSION

The current study found prevalence of general anxiety as high as 50% among pharmacy students, with 25% exhibiting a high level of clinical general anxiety. We found gender, physical activity, academic distress, and
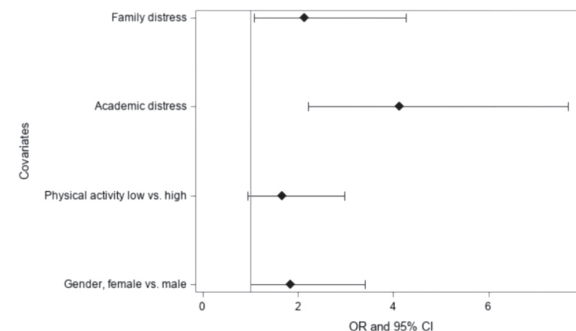

Figure 1. Binomial Logistic Regression for Clinical General Anxiety and Associated Factors. Coding for categorical variables as follows: general anxiety: 0 = no general anxiety, 1 = general anxiety; academic distress: 0 = no academic distress, 1 = academic distress; family distress: 0 = no family distress, 1 = family distress; Gender: 0 = male, 1 = female; physical activity: 0 = at least 2-3 times/week, 1 = never/occasionally; CI = confidence interval; OR = odds ratio.

family distress as significant factors associated with general anxiety. After adjusting for common confounders, the effect of clinical academic distress and clinical family distress were persistent and were associated with clinical general anxiety.

The first demographic factor evaluated was gender. We found a higher rate of general anxiety both low-clinical general anxiety and high-clinical general anxiety among female students. Several studies have found the same association between female gender and a higher level of academic distress among pharmacy and non-pharmacy students.[1,25-27] The second factor evaluated was physical activity. Similar to the findings in the Feltz-Cornelis and colleagues study and the study by Xiang and colleagues, our data suggest an association between low physical activity and low-clinical general anxiety (Table 2).[28,29] However, contrary to these studies, we did not see any association between low physical activity and high-clinical general anxiety.[28,29] Our study suggests that the protective effect of physical activity is limited to low-clinical general anxiety but not high-clinical general anxiety.

Like previous studies, we found that high academic distress is associated with high general anxiety.[1,2,31] We found that students with high academic distress have a four times higher chance of exhibiting general anxiety (Figure 1). In support of our findings, in another study involving pharmacy students, the most important triggers of stress were related to curriculum causing higher academic distress.[30] 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 students' inability to adjust well to the new academic environment.[31] Contrary to their findings, we did not find any significant difference between P1, P2, and P3 students in terms of general anxiety.

Our findings further indicate that students with clinical family distress have a higher probability of clinical general anxiety. A previous study had found a significantly higher level of family distress among female pharmacy students compared to the general campus population.[1] However, they did not detect any association between family distress and general anxiety most likely because they only evaluated univariate relationships.[1] In our study, by controlling other confounding factors, we were able to reveal the association of family distress with general anxiety. Our results support those of a previous study that identified family issues as one of the main triggers of general anxiety among pharmacy students after accounting for the effect of academic-related factors.[27]

There are some limitations to 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 because that is classified as personal information. There were differences in the students' racial distribution as well as working status that may affect the generalizability of our findings. Also, with a 63% participation rate, our study was not immune to response bias. Another limitation of our study was that it was conducted at only one institution. Because curriculums across pharmacy colleges do differ, the association of academic distress with general anxiety should be considered with caution. Finally, despite the possibility that COVID-19 pandemic issues could have affected our results, an analysis comparing previous data from fall 2019 with spring 2020 for only P2 and P3 students did not show any significant differences in anxiety levels.

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 academic distress and clinical family distress had significant association with clinical general anxiety level. College administrators can provide support for students and their family members in making improvements in these areas.

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