



Gender Differences and Prevalence of Mental Health Problems in Students of Healthcare Units

Mehnaz Nuruddin Gitay¹ · Sarah Fatima¹ · Shahama Arshad¹ · Basmah Arshad¹ · Ahsan Ehtesham¹ · Muhammad Ameen Baig¹ · Muhammad Furqan Ilyas¹ · Shaad Farhat Rizvi¹ · Qadeer Farooqui¹ · Muhammad Masroor² · Zeba Haque¹

Received: 28 July 2016 / Accepted: 28 July 2018 / Published online: 25 August 2018
© Springer Science+Business Media, LLC, part of Springer Nature 2018, Corrected publication September/2018

Abstract

The aim of the present was to assess and compare the mental health of male and female healthcare students in a Health University of Karachi, Pakistan. A cross-sectional study was conducted for which questionnaire was designed along the standard scoring scales of depression (PHQ-9), anxiety (GAD-7) and phobia (IAPT) completed by 300 enrolled students. Females (52%) of the medical institute suffered from mild to moderately-severe depression in contrast to the males (33%). Females were found to be affected by mild anxiety and phobia (42.7 and 26% respectively) exceeding the male population (27.3 and 15.3% respectively). However, severe depression or anxiety was not observed in either gender groups significantly, suggesting a healthy mental picture of these medical students. It can be concluded that health care students in modern upgraded education systems, in contrast to evidence from literature, have been able to adopt better coping mechanisms for maintaining their mental health.

Keywords Health care · Education · Psychological · Psychiatric · Depression · Anxiety · Gender

Introduction

Education in the modern world is considered as the foremost tool in the improvement of quality of life. It has become more competitive and is a key player in modern age survival strategies. The competitiveness of education has a great impact on the mental health status of students. It was observed in a study that individuals with an education

level below secondary school had the lowest rate of lifetime depression. The same study highlighted that women suffered from depression at a higher rate as compared to men (Akhtar-Danesh and Landeen 2007). Similar results were discussed in a recent study, though the positive correlation between lower education level and major depressive disorder was suggested to be viewed cautiously. As fewer individuals were educated at the pre primary or primary level, it was

✉ Mehnaz Nuruddin Gitay
quick_gitay@hotmail.com

Sarah Fatima
Sarahfatima07@hotmail.com

Shahama Arshad
Shahama_62@hotmail.com

Basmah Arshad
arshad.60@gmail.com

Ahsan Ehtesham
tariq_ch@hotmail.com

Muhammad Ameen Baig
ameen_baig_91@hotmail.com

Muhammad Furqan Ilyas
furqanmemon@hotmail.com

Shaad Farhat Rizvi
srizvi32@gmail.com

Qadeer Farooqui
hfaruki@hotmail.com

Zeba Haque
z.haque@duhs.edu.pk

¹ Department of Biochemistry, Dow International Medical College (Ojha Campus), Dow University of Health Sciences, Karachi, Pakistan

² Department of Medicine, Dow International Medical College, Dow University of Health Sciences, Karachi, Pakistan

inconvenient to conclude on the basis of a small sample size (Hardeman et al. 2015). Since competitive education systems such as medical and allied sciences cater to the intellectual quest and craving of individuals with a comparatively higher level of intelligence and responsiveness, the mental health of these students is prone to be affected from moderate to higher rates (Othman et al. 2013). An article published in the *Journal of the American Medical Association (JAMA)* postulated that there is an increased incidence of depression in individuals enrolled in medical program (Rubin 2014). Dahlin and coworkers have reported higher rates of depression in medical students with females taking the lead (Ngasa et al. 2017). Jafari et al. (2012) have also pronounced depression as a significant issue for medical trainees and females as major victims. Similar report from Abdulghani et al. (2011), in a cross-sectional study at a College of Medicine in Saudi Arabia, stated that female students were to be more affected by mental stress as compared to the male respondents.

Mental disturbance leading to behavioral changes can be categorized as depression, anxiety, or phobia, in context with study related stress. Students may suffer from anxiety associated with achieving deadlines; depression as a result of academic failures; and phobias related to repetitive occurrence of embarrassing situations that are brought about by failures and their inability to meet deadlines (Saravanan and Wilks 2014).

Students may often suffer from depression at various level of their academic growth. According to Diagnostic and Statistical Manual IV (DSM IV), depression is defined as a loss of interest or pleasure in daily activities previously enjoyed by the individual for more than 2 weeks. DSM V has stated a more explanatory description of depression, affirming depression as an illness, which adversely affects an individual's feelings, thought process, as well as their behavior leading to persistent feeling of sadness and loss of interest in previously enjoyed activities. It causes various emotional and physical problems that require long term treatment. According to a previous study, University students were found to suffer the most from depression rather than the general population; the conclusion concordant with studies since 1990 (Ibrahim et al. 2013). Similarly, Kulsoom and Afsar (2015) have also put forth through observation that medical students are more prone to depression as compared to their non-medical counterparts (Kulsoom and Afsar 2015) while it has been added in another study that females suffer more from depressive symptoms and anxiety (Hardeman et al. 2015). It has been observed in a study that the female to male ratio for depression is 1.7:1, with the socioeconomic differences, abuse etc being contributing factors (Rai et al. 2013).

Another disorder a student may suffer from is Anxiety. Anxiety, more appropriately termed Generalized Anxiety Disorder (GAD), is defined as a worry disorder (Andrews

et al. 2010). According to DSM V, GAD is said to be established in an individual if he or she is suffering from three or more conditions out of the following six: (1) Restlessness or feeling keyed up or on edge, (2) being easily fatigued, (3) difficulty concentrating or mind going blank, (4) irritability, (5) muscle tension, and/or (6) sleep disturbance [difficulty falling or staying asleep, or restless unsatisfying sleep (DSM V, Crocq 2017)]. The perception of the controllability of the worry and number of worry spheres may be a defining line between non-anxious controls and anxious patients (Macedo et al. 2014). Anxiety is not a disorder if it is not perceived as uncontrollable and if it helps an individual to perform better in a cautious manner. Curricular deadlines and expectations from friends and family do put individuals into worries as a result of which they strive harder to meet the expectations. Though, if an individual perceives the deadlines and expectations as impossible to achieve, even if his/her peers are attempting to do so, it should be considered as a sign of anxiety disorder.

According to The British Psychological Society, a phobia—from the Greek meaning 'flight' or 'terror'—is an extreme and irrational fear of an animal, object, place or situation that the remainder of the population would not fear. People who have phobias either avoid the situations they fear or are intensely anxious towards facing them. The affected individuals may develop panic attacks either being in the situation, or just at the thought of it. Social Phobia is a kind of complex phobia that evokes the person affected to avoid situations which require participation in social events. Thus, phobia may be termed as an outgrowth of anxiety disorder. Medical students exhibit high prevalence of social phobia (Ali 2013). It was concluded through a research that social phobia is accompanied by low self-esteem, thus affecting interpersonal relationships (Farmer and Kashdan 2014).

Owing to the fact that health care education is highly challenging and demanding, it subjects the students to immense stress, causing symptoms of depression and anxiety. It can be hypothesized that female health care students widely suffer from disturbed mental health on the basis of their physiological responses to stress. Present study was conducted to explore the gender differences and prevalence of mental health problems in health science students.

Methodology

A cross sectional study was conducted for which data was obtained from 300 students enrolled in a health sciences university, through a standardized questionnaire. The questionnaire was based on the Patient Health Questionnaire 9 (PHQ9) scoring system for screening of depression, generalized anxiety disorder 7 (GAD-7) for generalized anxiety disorder and also as a screening tool for panic, social anxiety,

and posttraumatic stress disorder. Improving Access to Psychological Treatment (IAPT) question for screening phobia was also included. Standard scoring for all the disorders was used to identify a significant case and its severity. Students suffering from any inflammation, infection or physical trauma were excluded to avoid any responses resulting from the suffering. The interviewees were soundly aware about the purpose of the questionnaire and their consent was taken prior to the interview, ensuring confidentiality.

Statistical analysis was done by Chi-square test to check the significance of difference between the males and females. $P < 0.05$ was considered significant.

Results

Operational Definitions

Depressed (Participants with Depressive Symptoms)

Participants were considered depressed (with depressive symptoms) according to the scoring criteria mentioned by the PHQ9 Questionnaire.

Participants with Symptoms of Anxiety (Anxious)

Participants were considered anxious (having symptoms of Anxiety) according to the scoring criteria mentioned by the GAD 7 Questionnaire (Tables 1, 2, 3, 4, 5).

Table 1 The difference in the prevalence of depression between genders

Gender	Not depressed		Depressed	
	# of resp.	% of resp.	# of resp.	% of resp.
Males	16	5.3	99	33
Females	29	9.7	156	52
P-value	0.0001			

The significance of difference is determined by the Chi-square test. $P < 0.05$ is considered significant

Table 2 The difference in the severity of depression between genders

Gender	Not depressed		Mild dep.		Moderate dep.		Moderately severe dep.		Severe dep.	
	# of resp.	% of resp.	# of resp.	% of resp.	# of resp.	% of resp.	# of resp.	% of resp.	# of resp.	% of resp.
Males	16	5.3	38	12.7	40	34.8	15	5	6	2
Females	29	9.7	59	19.7	53	28.6	32	10.7	12	4
P-value	0.053		0.026		0.216		0.011		0.157	

The significance of difference is determined by the Chi-square test. $P < 0.05$ is considered significant

Table 3 The difference in the prevalence of anxiety between genders

Gender	Not anxious		Anxious	
	# of resp.	% of resp.	# of resp.	% of resp.
Males	33	11	82	27.3
Females	57	19	128	42.7
P-value	0.0001			

The significance of difference is determined by the Chi-square test. $P < 0.05$ is considered significant

Discussion

It has been experienced over the years that students in a health care university face immense academic pressures. The students pass the entrance test that is highly competitive, in order to get admitted to the university. Health sciences education is highly demanding because of which students suffer from social and behavioral challenges (Makhal et al. 2015). It was concluded in a study that more than one-third of the medical trainees showed traits of poor mental health (Oku et al. 2015). The course of health studies is extensive, triggering logical decision making and laying the burden of responsibility for a healthy human race on the students. The course and learning in this area of education demands extra input of time and effort. Students adopt a daily routine that disturbs sleeping and eating habits (Sadeghian and Heidarian Pour 2009). Struggle for adaptation to the new environment accompanied with the burden of expectation subjects students to psychological challenges (Jamshidi et al. 2017). The present study has explored the gender differences in the prevalence of psychological disturbances like depression and anxiety. Since these are not clinically diagnosed disorders for this study, depression and anxiety are discussed as symptoms. The present findings indicate that female students suffer from depressive symptoms at a higher rate as compared to male students. In a study conducted on female students in Iran, it was reported that 43.6% students were suspected to be mentally and physically disturbed affected due to socio-economic conditions (Mokhtari et al. 2013).

The number of females is significantly higher in the group with mild depressive symptoms and also in the group

Table 4 The difference in the severity of anxiety between genders

Gender	Not anxious		Mild anx.		Moderate anx.		Severe anx.	
	# of resp.	% of resp.	# of resp.	% of resp.	# of resp.	% of resp.	# of resp.	% of resp.
Males	33	11	37	12.3	30	10	15	5
Females	57	19	63	21	40	13.3	25	8.3
P-value	0.015		0.006		0.279		0.114	

The significance of difference is determined by the Chi-square test. $P < 0.05$ is considered significant

Table 5 The difference in the prevalence of Phobia between genders

Gender	Not Phobic		Phobic	
	# of resp.	% of resp.	# of resp.	% of resp.
Males	69	23	46	15.3
Females	107	35.7	78	26
P-value	0.0001			

The significance of difference is determined by the Chi-square test. $P < 0.05$ is considered significant

with moderately severe depressive symptoms. Noticeably, the mental health of females ranges from mild depressive symptoms to moderately severe ones. This signifies that even though females are susceptible to unhealthy mental status due to the hormonal fluctuations that are part of their physiology, they are not significantly higher in number in the group with severe depressive symptoms. The encouraging aspect of female hormonal milieu is that estrogen is neuroprotective (Brann et al. 2007; Garcia-Segura et al. 2001), thus the coping abilities of young women during phases of high presence of estrogen should not be ignored.

Anxiety too has been found to be more common in females as compared to males. Majority of females suffer from mild anxiety that may perhaps be a driving force for these young women for better performance. Anxiety in females is metacognitive, related to the belief that worry is uncontrollable. This belief of females leads them to develop Type II worry, which is defined as worry about a worry (Bahrami and Yousefi 2011). This being not enough to justify female anxiety, worth mentioning is a study carried out on rats that demonstrated a strong effect of female sex hormones in containment of anxiety (Zimmerberg and Farley 1993). Low serum levels of endogenous cycling estradiol in females are associated with increased levels of fear. Estrogen receptors are located in the brains of men and women alike though subcellular distribution in the hypothalamus is different in both the male and female human hypothalamus (Lebron-Milad and Milad 2012). Thus, it can be concluded that several chemical mediators have a potential of impacting anxiety in the female gender.

Phobia or unnecessary fear of objects, animals, and society is another major problem medical students are found to suffer from. This disorder frequently coexists with major

depression and may potentially lead to the onset of severe depression (Rush et al. 2005; Beesdo et al. 2007). The IAPT scale for phobia in the present research demonstrates that females are more likely to experience phobia. According to the IAPT reasoning for the prevalence of phobia and its relationship with depression and anxiety, it is explained that phobia associated with avoidance helps in reduction of situations that may lead to anxious moments and depressive events. Thus, the PHQ-9 and GAD-7 scoring may not be an accurate representation in phobic individuals. Therefore, phobia in these students may serve to be protective against depression and anxiety, providing them with a longer time period to work towards their educational goals.

It can be concluded that out of the students screened for depression, anxiety, and phobia, the females exhibited increased susceptibility for the mental conditions, though not severe in type. This suggests a more vulnerable mental activity and struggle but not hopelessness. The findings of this research highlight the improvement in the teaching methodology and curriculum. Also the accessibility to peer support groups and mentors can help to make learning a comfort to a great extent. Further studies are required to establish a highly beneficial program that is easily accessible to each individual during their student life. Medical students should be provided with social services within their educational institute that would allow them to progress overtime and maintain their mental health especially during their phase of high academic demands.

Compliance with Ethical Standards

Conflict of interest No conflict of interest exists among the authors.

References

- Abdulghani, H. M., AlKanhil, A. A., Mahmoud, E. S., Ponnampuruma, G. G., & Alfaris, E. A. (2011). Stress and its effects on medical students: A cross-sectional study at a college of medicine in Saudi Arabia. *Journal of Health, Population, and Nutrition*, 29(5), 516.
- Akhtar-Danesh, N., & Landeen, J. (2007). Relation between depression and sociodemographic factors. *International Journal of Mental Health Systems*, 1(1), 4.
- Ali, S. K. (2013). 861—Social phobia among medical students. *European Psychiatry*, 28, 1.

- Andrews, G., Cuijpers, P., Craske, M. G., McEvoy, P., & Titov, N. (2010). Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: A meta-analysis. *PLoS one*, *5*(10), e13196.
- Bahrami, F., & Yousefi, N. (2011). Females are more anxious than males: A metacognitive perspective. *Iranian Journal of Psychiatry and Behavioral Sciences*, *5*(2), 83.
- Beesdo, K., Bittner, A., Pine, D. S., Stein, M. B., Höfler, M., Lieb, R., & Wittchen, H. U. (2007). Incidence of social anxiety disorder and the consistent risk for secondary depression in the first three decades of life. *Archives of General Psychiatry*, *64*(8), 903–912.
- Brann, D. W., Dhandapani, K., Wakade, C., Mahesh, V. B., & Khan, M. M. (2007). Neurotrophic and neuroprotective actions of estrogen: Basic mechanisms and clinical implications. *Steroids*, *72*(5), 381–405.
- Crocq, M. A. (2017). The history of generalized anxiety disorder as a diagnostic category. *Dialogues in Clinical Neuroscience*, *19*(2), 107.
- Farmer, A. S., & Kashdan, T. B. (2014). Affective and self-esteem instability in the daily lives of people with generalized social anxiety disorder. *Clinical Psychological Science*, *2*(2), 187–201.
- Garcia-Segura, L. M., Azcoitia, I., & DonCarlos, L. L. (2001). Neuroprotection by estradiol. *Progress in Neurobiology*, *63*(1), 29–60.
- Hardeman, R. R., Przedworski, J. M., Burke, S. E., Burgess, D. J., Phelan, S. M., Dovidio, J. F., ... van Ryn, M. (2015). Mental well-being in first year medical students: A comparison by race and gender. *Journal of Racial and Ethnic Health Disparities*, *2*(3), 403–413.
- Ibrahim, A. K., Kelly, S. J., Adams, C. E., & Glazebrook, C. (2013). A systematic review of studies of depression prevalence in university students. *Journal of Psychiatric Research*, *47*(3), 391–400.
- Jafari, N., Loghmani, A., & Montazeri, A. (2012). Mental health of medical students in different levels of training. *International Journal of Preventive Medicine*, *3*(Suppl1), S107.
- Jamshidi, F., Mogehe, S., Cheraghi, M., Jafari, S. F., Kabi, I., & Rashidi, L. (2017). A cross-sectional study of psychiatric disorders in medical sciences students. *Materia Socio-Medica*, *29*(3), 188.
- Kulsoom, B., & Afsar, N. A. (2015). Stress, anxiety, and depression among medical students in a multiethnic setting. *Neuropsychiatric Disease and Treatment*, *11*, 1713.
- Lebron-Milad, K., & Milad, M. R. (2012). Sex differences, gonadal hormones and the fear extinction network: Implications for anxiety disorders. *Biology of Mood & Anxiety Disorders*, *2*(1), 3.
- Macedo, A., Marques, M., & Pereira, A. T. (2014). Perfectionism and psychological distress: A review of the cognitive factors. *International Journal of Clinical Neurosciences and Mental Health*, *1*(6), 1–10.
- Makhal, M., Ray, P. K., Ray, S., Ghosh, S., Majumder, U., De, S., ... Bera, N. K. (2015). Prevalence of psychiatric morbidity among undergraduate students of a dental college in West Bengal. *Journal of Clinical and Diagnostic Research: JCDR*, *9*(7), ZC68.
- Mokhtari, M., Dehghan, S. F., Asghari, M., Ghasembaklo, U., Mohamadyari, G., Azadmanesh, S. A., & Akbari, E. (2013). Epidemiology of mental health problems in female students: A questionnaire survey. *Journal of Epidemiology and Global Health*, *3*(2), 83–88.
- Ngasa, S. N., Sama, C. B., Dzekem, B. S., Nforchu, K. N., Tindong, M., Aroke, D., & Dimala, C. A. (2017). Prevalence and factors associated with depression among medical students in Cameroon: A cross-sectional study. *BMC Psychiatry*, *17*(1), 216.
- Oku, A., Oku, O., Owoaje, E., & Monjok, E. (2015). An assessment of mental health status of undergraduate medical trainees in the University of Calabar, Nigeria: A cross-sectional study. *Open Access Macedonian Journal of Medical Sciences*, *3*(2), 356.
- Othman, C. N., Farooqui, M., Yusoff, M. S. B., & Adawiyah, R. (2013). Nature of stress among health science students in a Malaysian University. *Procedia-Social and Behavioral Sciences*, *105*, 249–257.
- Rai, D., Zitko, P., Jones, K., Lynch, J., & Araya, R. (2013). Country- and individual-level socioeconomic determinants of depression: Multilevel cross-national comparison. *The British Journal of Psychiatry*, *202*(3), 195–203.
- Rubin, R. (2014). Recent suicides highlight need to address depression in medical students and residents. *JAMA*, *312*(17), 1725–1727.
- Rush, A. J., Zimmerman, M., Wisniewski, S. R., Fava, M., Hollon, S. D., Warden, D., ... Thomas, B. (2005). Comorbid psychiatric disorders in depressed outpatients: Demographic and clinical features. *Journal of Affective Disorders*, *87*(1), 43–55.
- Sadeghian, E., & Heidarian Pour, A. (2009). Stressors and mental health status among students of Hamadan University of Medical Sciences. *Journal of Hayat*, *15*(1), 71–80.
- Saravanan, C., & Wilks, R. (2014). Medical students' experience of and reaction to stress: The role of depression and anxiety. *The Scientific World Journal*, *2014*, 737382.
- Zimmerberg, B., & Farley, M. J. (1993). Sex differences in anxiety behavior in rats: Role of gonadal hormones. *Physiology & Behavior*, *54*(6), 1119–1124.