fortune Journals

Research Article

JOURNAL OF PSYCHIATRY AND PSYCHIATRIC DISORDERS

ISSN: 2572-519X

Prevalence of Alexithymia and Depression in Medical Students Necessitate Attention

Marium Aftab[1*], Razia Aftab Ahmed[2], Komal Tirath[3], Ayesha Jawad[4], Rida Saleem[5]

Abstract

Background: Medical students are vulnerable to psychological problems like alexithymia and depression due to the pressure of time commitments, rapidly changing knowledge, exposure to emotionally challenging experiences, and meeting high expectations from society. Our study aims to find the prevalence of these problems in medical students in Karachi, Pakistan.

Methodology: This cross-sectional study includes 414 undergraduate medical students from multiple medical universities. The study tool was uploaded on Google survey; a questionnaire with background characteristics, TAS-20 scale for alexithymia prevalence, and PHQ-9 for depression prevalence.

Results: Out of 414 participants, 300 (72.5%) were females and 114 (27.5%) males. The majority were between the age range 21-33 (59%), among them 222(54%) from governmental medical universities and 192 (46%) from the private sector. Most had no chronic disease or financial problems. Alexithymia was found in 268 students (64.7%), while 15.9% were in the category of possible alexithymia. Depression was present in 291 (70%) students, depression severity score was 14±7. External-oriented thinking was higher than other subscales of alexithymia. Alexithymia had a statistically significant association with age, female gender, education level, lower GPA, lack of physical training, and depression. In turn, depression had a significant relation with the female gender, higher education level, and poor exam performance. Regression analysis showed that severe depression was a strong predictor of Alexithymia with a p-value of <0.001.

Conclusion: The study revealed a very high prevalence of alexithymia and depression in medical students necessitating attention because their well-being means physicians' well-being and a path to strengthening patient care and professionalism.

Keywords: Undergraduate Medical Students; Prevalence; Alexithymia; Depression; Attention

Abbreviations: TAS-20 scale: Toronto Alexithymia Scale; PHQ-9: Patient Health Questionnaire with nine questions

Introduction

People suffering from alexithymia are not able to identify and describe their own emotions; they know very little about their feelings and are mostly unable to link them with memories, fantasies, or specific situations [1]. The

Affiliation:

[1]Dow University of Health Sciences, Nanakwara, Karachi, 74200, Sindh, Pakistan

[2]Department of Family and Community Medicine, King Khalid University, Abha, Saudi Arabia

[3]Medical student, Ziauddin Medical College, Karachi, Pakistan

[4]Medical student, Karachi Medical and Dental College, Karachi, Sindh, Pakistan

[5]Medical student, Sir Syed College of Medical Sciences Affiliated with Jinnah Sindh Medical University, Karachi, Sindh, Pakistan

***Corresponding author:**

Marium Aftab, Dow University of Health Sciences, Nanakwara, Karachi, 74200, Sindh, Pakistan

Citation: Marium Aftab, Razia Aftab Ahmed, Komal Tirath, Ayesha Jawad, Rida Saleem. Prevalence of Alexithymia and Depression in Medical Students Necessitate Attention. Journal of Psychiatry and Psychiatric Disorders. 7 (2023): 191-200.

Received: August 15, 2023
Accepted: September 21, 2023
Published: November 14, 2023

Marium Aftab M, et al., J Psychiatry Psychiatric Disord 2023
DOI:10.26502/jppd.2572-519X0200

real problem for people with alexithymia is that not only they have no words for their emotions, but they also lack the emotions themselves. Alexithymia represents a cluster of cognitive traits that include difficulty identifying feelings, difficulty describing feelings to others, externally oriented thinking (preference for focusing on external events rather than inner experiences), and limited imaginative capacity. Therefore, people with alexithymia may demonstrate deficiencies in emotional awareness and communication and show little insight into their feelings, symptoms, and motivation [2]. Moreover, alexithymia is linked to deficits in empathy, i.e., the ability to take the perspective of others and to understand others' feelings and intentions [1,3]. An inability to accurately understand and describe one's internal affective states will thus lead to difficulties empathizing with others' feelings [4]. The Diagnostic and Statistical Manual of Mental Disorders does not list alexithymia as a mental disorder. It is a multidimensional personality trait, and each person's level of intensity will vary, and everyone with the condition is not the same; some have gaps and distortions in the typical emotions felt, some may feel an emotion but don't know which, whereas others muddle signs of certain emotions for something else and may intensify and misinterpret ordinary bodily sensations associated with emotional arousal as physical disease. People with higher scores for alexithymia can endure continuous problems in processing emotions at a cognitive level and regulating them, putting them at risk of developing psychiatric conditions. It has been documented that alexithymia is a major risk factor for psychological distress and chronic psychopathology. Many studies show that multiple psychiatric disorders overlap with alexithymia, such as alexithymia is found to be associated with eating disorders, depression, anxiety disorders, and substance abuse [5-8]. Also, a study emphasized a significant positive association of alexithymia with interpersonal problems regarding; assertiveness, sociability, submissiveness, intimacy, responsibility, and control [9]. People with alexithymia show a limited ability to experience positive emotions. As a result, many of these individuals are anhedonic [8]. Studies also relate higher scores of alexithymia with some physical health problems like heart-related problems, hypertension, diabetes, and functional dyspepsia, etc. [10,11]. Also increasing age, lack of family support, divorce, single and low social status is associated with alexithymia [12,13]. The fact that the presence of alexithymia in a subject may decrease the feeling of empathy may be detrimental to future doctor's medical practice that emphasizes professional behavior, with empathy being one of the essential elements; this augments the necessity of early recognition of the condition and thereby to help these students in getting timely management.

Like alexithymia, depression is also linked to numerous other physical and psychological diseases, and if severe, it can lead to suicidal tendencies in students. Moreover, depression has been documented to be associated with alexithymia in several studies [6,7]. A higher prevalence of both conditions may lead to augmented student suffering and poorer performance. Clinically relevant alexithymia affects approximately ten percent (7.7 -9.1%) of the general population. [13,14]. Both alexithymia and depression are documented to be even more common in young students [15], and it is found to be a major problem faced by students, especially medical students; this can be explained by the hard work and dedication required in their studies and practical training [16,17]. Considering the facts revealed by various studies that students with alexithymia and depression may have poor academic performance and they may have difficulty in adjusting with fellow students and health care team, which could result in maladaptive behaviors like; smoking, substance abuse, lack of physical activity, and other psychological problems [16-18]; it seems important to highlight the prevalence of these conditions in medical students studying at various medical universities in Karachi, Pakistan and also important is to find out the associated factors with these conditions.

Accordingly, this study was planned to appraise the prevalence and severity scores of alexithymia and depression among medical students at randomly selected medical universities in Karachi, Pakistan; along with this, it aimed to find the association with some of the factors mentioned in previous studies for these two important psychological problems.

Study Aims and Objectives:

- To assess the prevalence of alexithymia and depression among medical students at several medical universities in Karachi, Pakistan
- To investigate the potential association of alexithymia with factors such as gender, living with parents, year of study, residential status, grade point average (GPA), smoking, physical inactivity, history of mental illness, and chronic illness among medical students.
- To find potential association of depression with the same socio-demographic factors such as gender, living with parents, year of study, residential status, grade point average (GPA), smoking, physical inactivity, history of mental illness, and chronic illness among medical students.
- To study depression as a predictor of Alexithymia.

Materials and Methods

Study Design and Setting

This is an analytical cross-sectional, questionnaire-based survey carried out among undergraduate medical students in several Medical Colleges in Karachi, Pakistan.

Marium Aftab M, et al., J Psychiatry Psychiatric Disord 2023
DOI:10.26502/jppd.2572-519X0200

Study Population inclusion and exclusion criteria

Medical students in all five years of undergraduate studies in several medical universities in Karachi, Pakistan, were invited to participate in this study. Students who refused to participate and forms with missing data were excluded.

Sample Size

The sample size was calculated using the Roasoft online sample size calculator [19], assuming the total population of approachable medical students = 10500 (there are 19 medical colleges in Karachi. Collectively 2100 students are admitted each year in all these colleges; multiplying them by 5 (undergraduate years of study), we can calculate it to be around 10,500 medical students), the prevalence of alexithymia = 50% (as it is not known from previous studies), 95% confidence interval and 5% acceptable errors, the sample calculated was 371. Since 414 students responded, all were included.

Sampling Technique

The study tool was uploaded in the Google survey form. Four students from various medical colleges participated in posting the forms; they used simple random sampling technique for posting them to various medical colleges. Participants were assured about the anonymity and confidentiality of their responses to the questionnaire. The responding students were then grouped according to their year of study.

The study tool

The study tool was a questionnaire with three parts:

1. Background characteristics: including; age, gender, cumulative GPA, student educational level, medical college, whether private or governmental, BMI, marital status, smoking status, physical training, family income, housing along with the presence of any chronic condition like diabetes, hypertension, asthma, cardiac, neurological, psychiatric condition. liver or kidney diseases
2. The second part contained: the Toronto Alexithymia Scale 20 (TAS-20) to assess the prevalence of alexithymia A self-report scale that assesses two affective facets (difficulty fantasizing and difficulty emotionalizing) in addition to three cognitive facets. Based on these facets, an affective and a cognitive dimension of alexithymia can be distinguished. The TAS-20 is a self-report scale comprising 20 items rated using a five-point Likert scale where 1=strongly disagree and 5=strongly agree. The cutoff scores on the TAS-20 are ≤51 for the low end (meaning no alexithymia) and ≥61 for the high end (alexithymia). Scores between 52 and 60 indicate possible alexithymia [23]. The TAS-20 has three subscales:

- Difficulty Describing Feelings (DDF) subscale measures difficulty describing emotions. 5 items – 2, 4, 11, 12, 17.
- Difficulty Identifying Feeling (DIF) subscale measures difficulty identifying emotions. 7 items – 1, 3, 6, 7, 9, 13, 14.
- Externally Oriented Thinking (EOT) subscale measures individuals' tendency to focus their attention externally. 8 items – 5, 8, 10, 15, 16, 18, 19, 20.

3. The third part contained: The Patient Health Questionnaire-9 (PHQ-9) is a self-administered questionnaire used to screen depression and assess its severity. The items were scored on a 4-point scale rated from 0 (not at all) to 3 (nearly every day). The cut-off score was 10 (PHQ-9 ≥10), indicating that a patient had a positive screening test for depression. The total score was classified into diagnostic algorithms according to DSM-IV as following: a score from 10 to 14 was considered moderate depression, 15–19 was moderately severe depression, and 20–27 indicated severe depression 24.

Statistical Analysis Plan

Data was analyzed using the Statistical Package for Social Sciences (SPSS) program, version 26. Descriptive statistics, included percentages, means, ranges, and standard deviations, were used to describe data regarding alexithymia and depression. The t-test detected the difference between male and female students regarding major studied variables. Pearson and Spearman correlation coefficients were used to examine the association between alexithymia and other studied variables. Multiple regression analysis was used to detect the variables that best correlate with alexithymia. All statistical assumptions were met. Statistical significance was set at P≤.05; Reporting followed the "Strengthening Reporting of Observational Studies in Epidemiology (STROBE) statement" for cross-sectional studies.

Results

Out of 414 participants, 300 (72.5%) were females, and 114 (27.5%) were males, with the majority between the age range of 21-33 (n =244, 59%; details in Figure-1). Among the participants, 222 (54%) belonged to the public sector medical universities, whereas 192 (46%) were from the private sector. The responses were received from all medical students, in which the majority were in the 4th year of education with 142 (34%), followed by the final year 112 (27%). Only 10(2%) responses were received from the first-year students. Most of the student's family income was between 100,001 PKR per month to greater than 200,000 PKR. The majority were free of any chronic illness. (Table 1).

The prevalence of alexithymia was estimated to be 64.7%, while 15.9% were found to be in the category of possible alexithymia. Depression was present in 291, that is, 70% of students, and the depression severity score was 14 ± 7 among these students. The details of these are shown in Table 2.

Marium Aftab M, et al., J Psychiatry Psychiatric Disord 2023
DOI:10.26502/jppd.2572-519X0200

Table 1: Background Characteristics of the Participants

Variables		Frequency	Percent
Age	less than 18	5	1.2
	18-20	88	21.3
	21-23	244	58.9
	24-26	72	17.4
	greater than 26	5	1.2
Gender	female	300	72.5
	male	114	27.5
GPA	less than 1.5	7	1.7
	1.5-2.49	75	18.1
	2.5-3.5	242	58.5
	more than 3.5	90	21.7
Education	1st	10	2.4
	2nd	75	18.1
	3rd	75	18.1
	4th	142	34.3
	final	112	27.1
College/ University	private	192	46.4
	government	222	53.6
BMI	less than 18.5	65	15.7
	18.5-24.99	234	56.5
	25-29.99	83	20
	30-34.99	21	5.1
	35-39.99	8	1.9
	40 or more	3	0.7
Monthly family income	less than 50k	41	9.9
	50k-100k	118	28.5
	101k-200k	137	33.1
	more than 200k	118	28.5
Housing	rented	74	17.9
	own	235	56.8
	student hostel	105	25.4
chronic illness	yes	30	7.2
	no	384	92.8

Table 2: Frequency of Alexithymia and Depression among Medical Students.

		Frequency	Percentage
Alexithymia	No Alexithymia	80	19.4
	Possible Alexithymia	66	15.9
	Alexithymia	268	64.7
		414	100
Depression	Yes	291	70%
	No	123	30%
		414	100

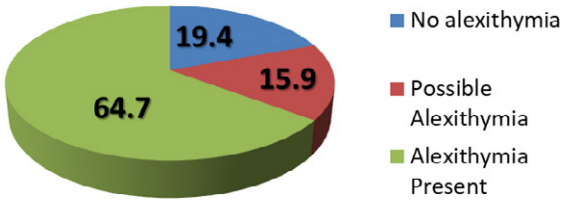

Figure 1: Alexithymia prevalence.

Studying the individual questions (2, 4, 11, 12, 17), it was found that the mean for difficulty describing feelings (DDF) subscale response was = 3.414, while the response to questions representing difficulty identifying feeling (DIF) subscale (1, 3, 6, 7, 9, 13, 14) was = 3.09, and those showing externally oriented thinking (EOT) subscale (5, 8, 10, 15, 16, 18, 19, 20). was estimated to be = 3.57. As shown in Table 3, this indicates that the students have more problems with externally oriented thinking in comparison to other subscales; the next was DDF and last was DIF.

The potential association of alexithymia was investigated with different factors such as age, gender, education, grade points, smoking status, physical inactivity and chronic diseases among medical students. A statistically significant association of alexithymia was seen in age, education level, GPA, physical training and depression (Table 4).

The potential association of depression with different factors was also investigated, and it was revealed that it is significantly related to the female gender, students' education level, and their performance, that is their GPA.

Regression analysis confirmed a statistically significant association between alexithymia scores and depression among the medical students, as 229 students with depression also had scores representing alexithymia, while 38 students with depression had scores showing possible alexithymia. The regression analysis also revealed that severe depression could be a predictor of Alexithymia with p value less than 0.001.

Marium Aftab M, et al., J Psychiatry Psychiatric Disord 2023
DOI:10.26502/jppd.2572-519X0200

Table 4: Association of Alexithymia with Background Characteristics.

Variables	No Alexithymia (n=80)	Possible Alexithymia (n=65)	Alexithymia (n=269)	p-value
Age				
Less than 18 years	0	1	4	0.026*
18-20	10	8	70	
21-23	49	41	154	
24-26	19	13	40	
greater than 26	2	2	1	
Gender				
Female	54	41	205	0.056
Male	26	24	64	
Student Educational level:				
First-year	0	0	10	0.001*
Second year	8	12	55	
Third year	10	5	60	
Fourth year	38	28	76	
Final year	24	20	68	
GPA				
less than 1.5	0	0	7	<0.001*
1.5-2.49	2	6	67	
2.5-3.5	58	35	149	
more than 3.5	20	24	46	
Smoking status				
Smoker	5	7	21	0.598
Nonsmoker	75	58	248	
Physical training				
Never	28	29	105	0.033*
Once a week	20	10	63	
two times a week	17	12	68	
three times a week	6	3	21	
More than three times	9	11	12	
chronic illness				
Yes	6	4	20	0.934
No	74	61	249	
Depression				
Yes	24	28	229	<0.001*
No	56	27	40	
*Statistically significant value by chi-square test.				

Marium Aftab M, et al., J Psychiatry Psychiatric Disord 2023
DOI:10.26502/jppd.2572-519X0200

Table 5: Association of Depression with Background Characteristics.

	Depression		
Variables	**Yes (n=291)**	**No (n=123)**	**p-value**
Age			0.227
Less than 18 years	3	2	
18-20	70	18	
21-23	169	75	
24-26	46	26	
greater than 26	3	2	
Gender			0.028*
Female	220	80	
Male	71	43	
Student Educational level:			0.003*
First year	7	3	
Second year	58	17	
Third year	64	11	
Fourth year	87	55	
Final year	75	37	
GPA			<0.001*
less than 1.5	6	1	
1.5-2.49	72	3	
2.5-3.5	160	82	
more than 3.5	53	37	
Smoking status			0.938
Smoker	23	10	
Nonsmoker	268	113	
Physical training			0.007*
Never	111	51	
Once a week	67	26	
two times a week	79	18	
three times a week	18	12	
More than three times	16	16	
chronic illness			0.52
Yes	20	10	
No	271	113	

Discussion

The prevalence of alexithymia (64.7%) in our participating students was found to be relatively higher than in many other studies from different regions of the world. The prevalence of alexithymia among the participants was found to be 26.9% in medical students at Riyadh, KSA [21], similar to 24.6% in medical students at Jordanian university [22], while it was slightly higher at 49% among medical students at Jeddah KSA [23] and found to be at 47.4% in medical students at Abha, KSA [24]. The prevalence of alexithymia was documented to be 34% in a study among Chinese medical students, [25] a study from undergraduate students from the University of Information Technology, Engineering and Management Sciences in Pakistan reported that 33% of their participating students had alexithymia scores [26]. The same researcher found the prevalence to be 93% in males and 87% in female participants from the general adult population [27]. A study from Umm AlQura University, Makkah, KSA revealed a prevalence of 56.5%, much closer to our finding [28]. These different prevalence rates, widely varying from 24.6% to 93% may be explained by the fact that there is a difference in coping with emotions across different cultures, different age groups, and different levels of psychiatric illnesses, which could influence the prevalence of alexithymia. Furthermore, studies do reveal that there is some difference noted in alexithymia prevalence between Western and Asian cultures [29,30]. A study explains that one of the reasons for higher scores of alexithymia prevalence in Asian countries may reflect the fact that; parents in western cultures have been noted to express positive emotions and display physical affection more than Asian parents who are less eloquent. Therefore, higher scores of alexithymia in the present study may be due to the different social and ethical values in Pakistani culture and may reflect the fact that a higher prevalence of depression (70%) was also found in our participants. Another rationale could be that in the current study, a relatively large number of participants belonged to government institutes, and these students pursue not only one of the most difficult professions of specialized training with respect to course duration, competition, and emotional demands but also face difficulties as curriculum in government medical collages is mainly comprised of traditional courses that demand more hard work and higher stress level. The subscale scores for alexithymia in our subjects reflect higher problems in the domain of externally oriented thinking (EOT) in comparison to other subscales; difficulty describing feelings (DDF) and difficulty identifying feelings (DIF); this is in accordance with many studies showing the similar finding of having higher EOT in comparison to DDF and DIF [22,31]. A Japanese study in a large sample of 2718 found that DIF and DDF scores are high for teenagers, but decrease with age. While they found an almost linear positive correlation between age and the EOT scores [32]. Different studies related to gender differences in alexithymia are varied

Marium Aftab M, et al., J Psychiatry Psychiatric Disord 2023
DOI:10.26502/jppd.2572-519X0200

Table 6: Regression Analysis of Depression as a predictor of Alexithymia.

	Severe Depression	Without Depression	Odds Ratio (OR)	95%CI (Lower–Upper)	p-value
Possible Alexithymia	38	27	0.075	(0.042 – 0.134)	<0.001*
Alexithymia	229	40	0.246	(0.135 – 0.447)	<0.001*
*Statistically significant p-value					

and confusing. Some reported a non-significant relationship of alexithymia with gender [16,23]. Few studies report higher prevalence among males in comparison to women [11,26,33] while more studies show higher scores for women similar to the present study [13,16,21,22,24,28,29], as narrated in a previous article; this could be explained by the fact [29] that in Pakistani culture females have to pay more attention on other family members' as it is needed in extended families and be responsible for household duties along with their studies, also they are shy to express their feelings, and emotions openly. Besides the female gender, our study shows a statistically significant association of alexithymia with age, education level, GPA, physical training and depression. These findings are consistent with many other similar research studies. The association of alexithymia with increasing age has been documented in many other studies [13,32]. Higher scores for alexithymia were seen in students studying in the third and the fourth year of medical college; these are the initial years of the clerkship period when they start facing actual patients and come across the sufferings of patients and have a higher load of studies as well. Other researchers have also observed a similar finding in medical students [35]. Studies do report that subjects with chronic diseases were more likely to have alexithymia [24,34]. However, in the present study, we did not find any significant association between alexithymia and chronic disease; this may be because mostly our subjects were young people free of any chronic physical illness.

The association of alexithymia with lower educational grades (GPA) is consistent with many other studies [23,28]; students with high levels of alexithymia are reported to be more negatively affected by university stress compared to peers with low or no alexithymia and higher levels of stress can have detrimental impacts on academic performance; also lower grades themselves may lead to stress, anxiety, and depression that in turn lead to higher scores of alexithymia [16,36,37]. Our study result is in line with other studies documenting that students who do not participate in physical activities were more likely to suffer from alexithymia and had higher TAS-20 scores than those who actively participated in physical activities [21,23]. This could be explained by the known fact that engaging in physical activity may help reduce symptoms of depression [37-39]. While a similar study done at Abha, Saudi Arabia, failed to show any such significant association [24]. Depression prevalence was also found to be very high (70%) in our study participants, with severity scores showing moderate to severe problem (14 ± 7) among them. This is very close to a similar study in medical students [24]. A study from Pakistan revealed almost the same prevalence of depression in medical students, and it was also more in female students [40]. A systemic review also finds a high prevalence of depression in medical students and recommends early intervention to help them [41]. A significantly strong association was found between alexithymia and depression in our samples. This was also confirmed by regression analysis, and depression appeared as a strong predictor of alexithymia, especially for subjects showing higher scores on the PHQ-9 scale. In literature, it has been found that depression and alexithymia are different but highly related constructs [42,43]. Most of the studies, including that from India [42], Finland China [15], Australia [32], Jordan [22], Lebanon [44], and Saudi Arabia [21,23] are coincident with this finding. Whatever the reason for this association; whether they coexist or alexithymia is a consequence of depression, the fact revealed in our study, supported by the same finding from other global regions; is that these two conditions cause enormous enduring by the students not only from the condition per se but also from the sequel from these leading to lower performance level, other psychological and physical illnesses. The medical students considered to be the future saviors of the community may not be able to accomplish as experts in their practical life when suffering from depression plus alexithymia that can lead to lack of empathy (considered the cornerstone in medical practice); this may have a detrimental effect on their professionalism and the care of patients.

Conclusion

The present study shows a very high prevalence of both alexithymia and depression in students studying at various medical schools in Karachi, Pakistan. Among 414 undergraduate medical students who participated in the study, we found that 64.7 percent have TAS-20 scores consistent with alexithymia, while 70% suffered from depression according to the PHQ-9 depression scale. It highlights a statistically significant association of alexithymia and depression with female gender, education level, and GPA, while alexithymia was also significantly related to age and physical training. We emphasize further temporal studies to confirm these associations and highly recommend a prompt and appropriate strategy to help these silent sufferers. Our study stresses developing effective policies to screen, develop awareness programs and provide appropriate treatment to

Marium Aftab M, et al., J Psychiatry Psychiatric Disord 2023
DOI:10.26502/jppd.2572-519X0200

these students through psychological intervention and expert treatment.

Limitations and Strengths of the Study

There are a few limitations and weaknesses in our studies; firstly, as it is a self-reporting survey that requires self-awareness and knowledge about themself and the individuals with alexithymia may lack this insight, also biases from the respondents can be there, those with depression may exaggerate and respond more negatively. Another drawback could be due to the fact that this is a cross-sectional study design that does not allow conclusions to be made concerning relationships among variables and possible causal mechanisms; such issues can only be addressed via suitably designed longitudinal studies, The high scores of depression and alexithymia in our study provide evidence for identifying these disorders in medical students in Karachi, Pakistan, where only a few studies are available in this context. It also calls attention to the need for further research in this respect and for making policies that implement needful steps to help our future redeemers.

Recommendation

Our study strongly calls attention to this high prevalence of alexithymia and depression in undergraduate medical students. Appropriate management after identifying these students who are silently suffering may secure their future. It is known that timely treatment with pharmacological and non-pharmacological measures at an early stage may lead to mentally healthy professionals who can provide high-quality care to the community.

Conflict of Interest: None

References

1. FeldmanHall O, Dalgleish T, Mobbs D. Alexithymia decreases altruism in real social decisions. Cortex 49 (2013): 899-904.
2. Ricciardi L, Demartini B, Fotopoulou A, et al. Alexithymia in Neurological Disease: A Review. The Journal of Neuropsychiatry and Clinical Neurosciences 27 (2015): 179-187.
3. Valdespino A, Antezana L, Ghane M, et al. Alexithymia as a trans diagnostic precursor to empathy abnormalities: the functional role of the insula. Front. Psychol 8 (2017): 2234.
4. Bird G, Viding E. The self to other model of empathy: providing a new framework for understanding empathy impairments in psychopathy, autism, and alexithymia. Neurosci Biobehav Rev 47 (2014): 520-532.
5. Cochrane CE, Brewerton TD, Wilson DB, et al. Alexithymia in the eating disorders. The International Journal of Eating Disorders 14 (1993): 219-222.
6. Honkalampi K, Hintikka J, Laukkanen E, et al. Alexithymia and depression: a prospective study of patients with major depressive disorder. Psychosomatics 42 (2001): 229-234.
7. Kim JH, Lee SJ, Rim HD, et al. The Relationship between Alexithymia and General Symptoms of Patients with Depressive Disorders. Psychiatry Investig 5 (2008): 179-185.
8. Deborde AS, Berthoz S, Godart N, et al. Relations between alexithymia and anhedonia: a study in eating disordered and control subjects. L'encephale 32 (2006): 83-91.
9. Zarei J, Besharat MA. Alexithymia and interpersonal problems. Procedia - Social and Behavioral Sciences 5 (2010): 619-622.
10. Dubey A, Pandey R. Mental Health Problems in Alexithymia: Role of Positive and Negative Emotional Experiences, SIS J Proj Psy and Ment Health 20 (2013): 128-136.
11. Myles LAMK, Emanuele MM. Alexithymia and physical outcomes in psychosomatic subjects: a cross-sectional study. Journal of Mind and Medical Sciences 8 (2021).
12. Franz M, Popp K, Schaefer R, et al. Alexithymia in the German general population. Soc Psychiat Epidemiol 43 (2008): 54-62.
13. Mattilaa AK, Salminenc JK, NummiaT, Joukama M. et al. Age is strongly associated with alexithymia in the general population; Journal of Psychosomatic Research 61 (2006): 629-635.
14. Honkalampi K., Tolmunen T, Hintikka J. et al. The prevalence of alexithymia and its relationship with Youth Self-Report problem scales among Finnish adolescents Comprehensive Psychiatry 50 (2009): 263-268.
15. Ng CSM, Chan VCW. Prevalence and associated factors of alexithymia among Chinese adolescents in Hong Kong. Psychiatry Research 290 (2020): 113126.
16. Popa-Velea O, Diaconescu L, Mihailescu A, et al. Burnout and its relationships with alexithymia, stress, and social support among Romanian medical students: A cross-sectional study. Int J Environ Res Public Health 14 (2017): 560.
17. Dubey A, Pandey R. Mental health problems in alexithymia: Role of positive and negative emotional experiences. Journal of Projective Psychology and Mental Health 20 (2013): 128-136.
18. Bbasi M, Bagyan MJ, Dehghan H. Cognitive failure and alexithymia and predicting high–risk behaviors of

Marium Aftab M, et al., J Psychiatry Psychiatric Disord 2023
DOI:10.26502/jppd.2572-519X0200

students with learning disabilities. Int J High Risk Behav Addict 3 (2014): 16948.

19. Raosoft. Online Sample Size Calculator. (Accessed on 4 April 2017).

20. Bagby RM, Parker JDA, Taylor GJ. The twenty-item Toronto Alexithymia Scale—I. Item selection and cross-validation of the factor structure. APA PsycTests (1994).

21. Aljaffer MA, Almadani AH, Alghamdi SA, et al. Prevalence and associated factors of alexithymia among medical students: A cross-sectional study from Saudi Arabia. Neurosciences (Riyadh) 27 (2022): 257-262.

22. Hamaideh S H. Alexithymia among Jordanian university students: Its prevalence and correlates with depression, anxiety, stress, and demographics 2018, Perspective in psychiatric care 54 (2018): 274-280.

23. Alzahrani SH, Coumaravelou S, Mahmoud I, et al. Prevalence of alexithymia and associated factors among medical students at King Abdulaziz University: a cross-sectional study. Ann Saudi Med 40 (2020): 55-62.

24. Aleisa MA, Abdullah NS, Alqahtani, et al. Association between Alexithymia and Depression among King Khalid University Medical Students: An Analytical Cross-Sectional Study. Healthcare 10 (2022): 1703.

25. Zhu Y, Luo T, Liu J, et al. Influencing factors of alexithymia in Chinese medical students: A cross-sectional study. BMC Med Educ 17 (2017): 66.

26. Khan NT, Mumtaz F. Prevalence of Alexithymia among Undergraduates at Buitems; Epidemiology (Sunnyvale) 7 (2017): 333.

27. Khan NT. Prevalence of Alexithymia in the General Adult Population of Quetta, Balochistan in Pakistan. Clon Transgen 6 (2017): 160.

28. Alharthi AM, Almasoudi MA, Alotaibi MB, et al. Prevalence of Alexithymia and the influencing factors among medical students at Umm Al-Qura University: A cross-sectional study. Medical Science 26 (2022): 26e1947.

29. Fatima A, Ghayas S and Khawar R; Development and Validation of Alexithymia Scale for Pakistani Population, Pakistan Journal of Social and Clinical Psychology. 14 (2016): 3-9.

30. Le HN, Berenbaum H, Raghavan C. Culture and alexithymia: Mean levels, correlates, and the role of parental socialization of emotions. Emotion 2 (2002): 341-360.

31. McGillivray L, Becerra R, Harms C. Prevalence and demographic correlates of alexithymia: A comparison between Australian psychiatric and community samples. Journal of clinical psychology 73 (2017): 76-87.

32. Moriguchi Y, Maeda M, Igarashi T, et al. Age and gender effect on alexithymia in large, Japanese community and clinical samples: A cross-validation study of the Toronto Alexithymia Scale (TAS-20). Biopsychosoc Med (2007): 1-7.

33. Zaidi SMIH, Arshad M, Yaqoob N. Gender distinction in alexithymia among graduation students of Pakistan. European Journal of Research in Social Sciences 3 (2015): 1950-1956.

34. Tolmunen T, Lehto SM, Heliste M, et al. Alexithymia is associated with increased cardiovascular mortality in middle-aged Finnish men. Psychosom Med 7 (2010): 187-191.

35. Kulsoom B, Afsar NA. Stress, anxiety, and depression among medical students in a multiethnic setting. Neuropsychiatr Dis Treat 11 (2015): 1713-1722.

36. Lyvers M, Holloway N, Needham K, et al. Resilience, alexithymia, and university stress in relation to anxiety and problematic alcohol use among female university students. Aust J Psychol 72 (2020): 59-67.

37. Bell SL, Audrey S, Gunnell D. et al. The relationship between physical activity, mental wellbeing and symptoms of mental health disorder in adolescents: a cohort study. Int J Behav Nutr Phys Act 16 (2019): 138.

38. Dishman RK, Heath GW, Lee I-M. Physical activity epidemiology, 2nd edn Champaign: Human Kinetics (2013).

39. Biddle S. Physical activity and mental health: evidence is growing. World Psychiatry 15 (2016): 176-177.

40. Khan MS, Mahmood S, Badshah A, et al. Prevalence of depression, anxiety and their associated factors among medical students in Karachi, Pakistan. J Pak Med Assoc 56 (2006): 583.

41. Mirza AA, Baig M, Beyari GM, et al. Depression and Anxiety among Medical Students: A Brief Overview. Adv Med Educ Pract 12 (2021): 393-398.

42. Sagar R, Talwar S, Desai G, et al. Relationship between alexithymia depression: A narrative review, Indian Journal of Psychiatry 63 (2021): 127-133.

43. Marchesi C, Brusamonti E, Maggini C. Are alexithymia, depression, and anxiety distinct constructs in affective disorders? J Psychosom Res 49 (2000): 43-49.

44. Sfeir E, Geara C, Hallit S, et al. Alexithymia, aggressive behavior and depression among Lebanese adolescents: A cross-sectional study. Child Adolesc Psychiatry Ment Health 1 (2020): 32.