

Prevalence of alexithymia and associated factors among medical students at King Abdulaziz University: a cross-sectional study

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BACKGROUND: Medical students are at higher risk of developing alexithymia due to the nature of their studies.

OBJECTIVES: Determine the prevalence of alexithymia and potential risk factors among medical students in Saudi Arabia.

DESIGN: A cross-sectional analytic study.

SETTINGS: University medical school.

PATIENTS AND METHODS: An institutional cross-sectional survey of medical students was conducted using the Toronto Alexithymia Scale (TAS-20) to assess the prevalence of alexithymia and potentially associated factors (gender, parental marital status, grade point average, status of accommodations, smoking status, year of study, childhood abuse, a history of mental illness, and physical activity).

MAIN OUTCOME MEASURES: Gender, parental marital status, grade point average, status of accommodations, smoking status, year of study, childhood abuse, a history of mental illness, and physical activity.

SAMPLE SIZE: 347.

RESULTS: The prevalence of alexithymia among medical students was 49% (95% confidence interval [43.8–54.2]). A binary logistic regression model showed significant associations between alexithymia and academic year of study (lower risk of alexithymia in the clerkship (5th, 6th years); odds ratio [OR]: 0.43, 95% CI: 0.26–0.72), smoking (OR: 3.52, 95% CI: 1.60–3.34), grade point average (lowest; OR: 10.44, 95% CI: 4.24–25.77), history of childhood abuse (OR: 2, 95% CI: 1.20–8.77), and history of psychiatric illness (OR: 14.40, 95% CI: 4.76–21.06).

CONCLUSION: Almost half of the medical students suffer from alexithymia. Increasing the awareness about alexithymia among students and directing them where to seek help would facilitate the management of these problems.

LIMITATIONS: Limited only to medical students from the second year to the sixth year in a single medical college, which affects generalizability. The cross-sectional design might have also limited generalizability.

CONFLICT OF INTEREST: None.

Students who enter college from school life may face various challenges such as loneliness, alexithymia, substance abuse, and anxiety.¹⁻³ Researchers have found that alexithymia is one of the major problems faced by students,^{4,5} and it outweighs other academic and non-academic problems among student populations due to its non-clinical nature, meaning that sufferers are often unable to recognize they have a problem unless they have adequate mental health awareness and knowledge.^{3,5} Alexithymia is a subclinical experience of a lack of emotional awareness, or more specifically, difficulty in identifying and describing feelings and in distinguishing feelings from the bodily sensations of emotional arousal.⁶ These two manifestations of alexithymia are called trait alexithymia or state alexithymia. Trait alexithymia is believed to be a characteristic inherent in the personality, while state alexithymia has a specific cause and is often a temporary condition. It is difficult to modify inborn characteristics, such as with trait alexithymia, but we can modify the state characteristics of alexithymia.³ Hence, identifying the predictive factors of state alexithymia would be useful for helping to prevent or mitigate its detrimental effects in students. There are no diagnostic criteria in the DSM-5 for alexithymia because it is a symptom, not a disorder. However, this symptom can aggravate and cause other mental disorders.⁷

Medical students are more prone to alexithymia due to the nature of their coursework and training,⁸ and female students are generally more prone to alexithymia than male students,⁴ although one study by Scimeca et al⁹ found no significant differences in the prevalence of alexithymia by gender. Other studies have shown that year one and five students experience more alexithymia than students in years two, three, or four.^{10,11} Conversely, Morice-Ramat et al¹² found no significant difference in alexithymia between the years of study among medical students. However, these studies were conducted in Western societies and in other Asian countries, not in Saudi Arabia or other Arabian Gulf countries. Therefore, screening for alexithymia among students in different years of university medical programs would be beneficial for identifying which year of medical study, if any, poses more risk of experiencing alexithymia, thus facilitating the effective application of interventions aimed at preventing these potentially debilitating symptoms.

Students who experience alexithymia are more prone to exhibiting maladaptive behaviors such as suicide, substance abuse, low academic performance, and poor self-care as well as experiencing more

loneliness and maladjustment to university life.^{7,13,14} Although Faramarzi et al¹⁵ found that alexithymia was not a significant predictor of poor academic achievement among university students, people with alexithymia are more likely to use negative coping mechanisms such as smoking cigarettes to cope with crises.^{2,16} An additional aggravating factor is that lack of family support is one of the major problems among students suffering from psychological distress in Saudi Arabia.¹⁷ Since alexithymia potentially occurs in conjunction with smoking, lack of family support, and poor academic performance among medical students, it is important for researchers to try to determine whether these factors are significantly associated.

On the one hand, the Toronto Alexithymia Scale (TAS-20) model proposes that alexithymia is due to disturbances in the early child–mother relationship that negatively impacts childhood development of the ability to experience feelings or use fantasy as a means to satisfy instinctual drives.¹⁸ On the other hand, the Amsterdam Alexithymia Scale model categorizes alexithymia as either cognitive or affective, where the cognitive dimension refers to the ability to identify, verbalize, and analyze feelings, while the affective dimension refers to subjective emotional arousal and the levels of fantasizing and daydreaming.¹⁹ This model indicates that people experiencing cognitive alexithymia may not discuss their problems with others and instead use negative mechanisms such as smoking to cope with their loneliness and stress.²⁰ Affective alexithymia is more about preoccupation, which may have a negative impact on academic performance.²¹ With the Amsterdam Alexithymia Scale, the experience of alexithymia is further subdivided into two types, where Type-I alexithymia is characterized by high scores in both the cognitive and affective dimensions, whereas Type-II alexithymia is characterized by high scores on only the cognitive dimension. However, at present, there are no questionnaires or other tools for directly measuring Type 1 and Type 2 separately.

Based on the literature and theoretical frameworks, it seems that alexithymia is most likely one of the contributing factors to poor academic performance, lack of physical activity, chronic illness, and smoking cigarettes. Therefore, the aim of this study was to estimate the prevalence of state alexithymia among medical students at King Abdulaziz University and to investigate the potential association 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.

PATIENTS AND METHODS

This was a cross-sectional, questionnaire-based survey carried out among undergraduate students of the faculty of medicine during the months of January and February 2018. After obtaining ethical approval for the research (Reference No.1835), medical students in years 2 through 6 were approached after lectures and invited to participate in this. Participants were selected using a stratified sampling technique. Two research assistants who were not our students were recruited to collect data. Each participant was briefed about the purpose and objective of the study before being asked to give verbal consent to participate. Participants were also assured of anonymity and the confidentiality of their responses to the questionnaire. Finally, the participants were also instructed that participating in this study was not a part of their course requirements and that they could withdraw from the study at any time.

Participants were asked to provide their gender, date of birth, grad GPA, smoking behavior, and living status on the demographics portion of the questionnaire. They were then asked about their medical history; whether they had ever experienced emotional, physical, or sexual abuse during childhood; and how often they take part in physical activities. Variables included in the statistical analyses were identified from the literature and assessed for suitability in the context of Saudi Arabia.

To assess the prevalence of alexithymia, we used the Toronto Alexithymia Scale (TAS-20), one of the most commonly used measures of alexithymia. The TAS-20 is a self-report scale comprising 20 items that are rated using a five-point Likert scale where 1=strongly disagree, and 5=strongly agree. The TAS-20 has three subscales. The Difficulty Describing Feelings subscale measures difficulty describing emotions through five items; the Difficulty Identifying Feelings subscale is used to measure difficulty identifying emotions through seven items; and the Externally Oriented Thinking subscale uses eight items to measure the tendency of individuals to focus their attention externally. 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.²² This scale, administered in English, has been widely used by other researchers for assessing alexithymia in Arabic adult student populations^{2,4,23} after being validated in a pilot study conducted in Saudi Arabia. The alpha value of the scale for the overall Saudi population is 0.73,²⁴ while the alpha value of the scale in this study is 0.89.

Descriptive statistics were used for reporting par-

ticipant characteristics. The independent-samples *t* test, one-way analysis of variance (ANOVA), and chi-squared test were used to assess the association between participant factors and the TAS-20 scores. We reported means with standard deviations for numerical variables and frequencies with proportions for categorical variables. A binary logistic regression model with the primary outcome of interest being alexithymia (yes/no) was performed using stepwise forward modeling. The omnibus tests of model coefficients showed that the binary logistic regression models were statistically significant. Casewise plots were not produced because no outliers were found, and no multicollinearity was detected (variance inflation factor of <3). Statistical significance was set at $P \leq .05$. The data analysis was performed with IBM SPSS software, version 24.25 Reporting followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement for cross-sectional studies.

RESULTS

Prevalence of alexithymia

The 347 medical students who participated in this study had a mean (SD) age of 21 (1.5, range 18–27). The overall prevalence of alexithymia in our sample (TAS-20 score ≥ 61) was 49% (95% confidence interval 43.8–54.2), and prevalence among men was 51%, while among women, it was 49% ($P=.716$). The overall mean (SD) TAS-20 score for the entire study population was 61.6 (10).

Alexithymia and its associated factors

We identified high TAS-20 scores (≥ 61) in most of the variable categories in our study (**Table 1**).

A chi-squared test showed significant associations between alexithymia (TAS-20 scores ≥ 61) and academic year of study, GPA, smoking, history of psychiatric illness, and history of childhood abuse (**Table 2**). The stepwise forward binary logistic regression modeling showed that students who had a low GPA, history of childhood abuse, or history of psychiatric illness, or who smoked were more likely to have alexithymia when compared to students who had a high GPA, no history of childhood abuse, and no history of psychiatric illness or who were nonsmokers (**Table 3**). Moreover, students in years five and six (clerkship) were less likely to have alexithymia when compared to students in years two, three, or four (pre-clerkship) (**Table 3**). The R^2 measures of fit indicate that the model explained about 10% to 18% of the variability in the data.

Table 1. Characteristics of participants based on TAS-20 scores (N=347).

Variable	Total	Mean (SD)	P value
Gender			
Female	179 (51.6)	61.9 (10.5)	.608
Male	168 (48.4)	61.3 (9.5)	
Parental status			
Married	303 (87.3)	61.5 (9.6)	.368
Divorced	23 (6.6)	60.2 (11.4)	
Widowed	21 (6.1)	64.3 (13.6)	
Academic year of study			
Pre-clerkship	225 (64.8)	63.0 (9.8)	<.0001
Clerkship	122 (35.2)	59.0 (9.9)	
Residence			
Own house	271 (78.1)	61.6 (9.9)	.926
Rented house	67 (19.3)	61.6 (10.6)	
Students' dormitory	9 (2.6)	62.9 (9.4)	
Grade point average			
A (4.5–5)	207 (59.7)	61.2 (9.4)	.003
B (3.75–4.49)	115 (33.1)	60.9 (9.5)	
C (3.74–2.75)	14 (4.0)	64.4 (15.1)	
D (2.74–2)	11 (3.2)	72.1 (9.9)	
Smoking			
No	306 (88.2)	60.8 (10.0)	.001
Yes	41 (11.8)	66.4 (8.8)	
History of childhood abuse			
No	245 (70.6)	60.1 (9.4)	<.0001
Yes	102 (29.4)	65.1 (10.6)	
History of psychiatric illness			
No	334 (96.3)	61.2 (9.8)	<.0001
Yes	13 (3.7)	72.7 (9.6)	
Chronic illness			
No	306 (88.2)	61.6 (10.2)	.848
Yes	41 (11.8)	61.9 (8.4)	
Living with parents in childhood			
No	37 (10.7)	64.8 (9.6)	.042
Yes	310 (89.3)	61.2 (10.0)	
Physical activity			
Never	115 (33.1)	62.4 (10.2)	.348
Once a week	85 (24.5)	60.3 (9.8)	
≥2x a week	147 (42.24)	61.7 (9.9)	

Data are mean (SD).

The relationship between alexithymia and TAS-20 subscales

Table 4 reveals the relationship between an alexithymia diagnosis and the factor structures (subscales) of TAS-20 scores. Students with alexithymia (higher TAS-20 scores) were more likely to have difficulties in identifying or describing their feelings compared to students with no alexithymia or possible alexithymia (lower TAS-20 scores), $P < .05$ (**Table 4**). On the other hand, students with no alexithymia or possible alexithymia were more likely to have externally oriented thinking compared to students with alexithymia, $P < .05$

DISCUSSION

The present study estimated the prevalence of alexithymia and its association with different factors (demographic variables, smoking status, living with parents, GPA, physical activity, parental marital status, and physical activity). The prevalence of alexithymia in our sample was 49%, which is higher than what was found in studies conducted in other countries such as the Czech Republic (5.7%)²² Iran (21.8%),¹⁵ Jordan (24.6%),⁴ and China (37.7%).¹⁰ The high rate of alexithymia among these participants might be due to several factors that the literature indicates can increase the risk of mental disorders.^{3,7} These factors include beliefs about mental health problems, lack of knowledge about formal services, perceived societal stigma, doubts about the legitimacy of mental illnesses, and the use of informal indigenous resources.^{3,26} Medical students and health care professionals should have an awareness of the prevalence of alexithymia in their own lives as well as in the lives of patients.^{15,27} Health care practitioners who suffer from alexithymia may be unable to understand their own emotional problems, let alone the emotional problems of a patient,²⁸ which might affect the therapeutic alliance and treatment. Therefore, alexithymia needs to be ruled out or treated in students while they are still studying for their degrees. Otherwise, students who graduate with alexithymia may have problems dealing with their own emotions that lead to jeopardizing the treatment of their patients.

Our study found no significant difference in the prevalence of alexithymia among males and females, despite gender potentially being a significant risk factor for alexithymia. This result is consistent with at least one past study,²⁹ although gender was identified as a significant risk factor for alexithymia in other studies.^{4,10} Our study did demonstrate a slightly higher mean value of alexithymia among females, which may warrant further investigation.

Table 2. Characteristics of participants based on alexithymia score (N=347).

Variable	Total	No Alexithymia	Alexithymia	P value
Gender				
Female	179 (51.6)	93 (53)	86 (48)	.716
Male	168 (48.4)	84 (50)	84 (50)	
Parental status				
Married	303 (87.3)	157 (51.8)	146 (48.2)	.706
Divorced	23 (6.6)	10 (43.5)	13 (56.5)	
Widowed	21 (6.1)	10 (47.6)	11 (52.4)	
Academic year of study				
Pre-clerkship	225 (64.8)	102 (45.3)	123 (54.7)	.004
Clerkship	122 (35.2)	75 (61.5)	47 (38.5)	
Residence				
Own house	271 (78.1)	142 (52.4)	129 (47.6)	.515
Rented house	67 (19.3)	30 (44.8)	37 (55.2)	
Students' dormitory	9 (2.6)	5 (55.6)	4 (44.4)	
Grade point average				
A (4.5–5)	207 (59.7)	110 (53.1)	97 (46.9)	.036
B (3.75–4.49)	115 (33.1)	60 (52.2)	55 (47.8)	
C (3.74–2.75)	14 (4.0)	6 (42.9)	8 (57.1)	
D (2.74–2)	11 (3.2)	1 (9.1)	10 (90.9)	
Smoking				
No	306 (88.2)	167 (54.6)	139 (45.4)	<.0001
Yes	41 (11.8)	10 (24.4)	31 (75.6)	
History of childhood abuse				
No	245 (70.6)	140 (57.1)	105 (42.9)	<.0001
Yes	102 (29.4)	37 (36.3)	65 (63.7)	
History of psychiatric illness				
No	334 (96.3)	176 (52.7)	158 (47.3)	.001
Yes	13 (3.7)	1 (7.7)	12 (92.3)	
Chronic illness				
No	306 (88.2)	157 (51.3)	149 (48.7)	.761
Yes	41 (11.8)	20 (48.8)	21 (51.2)	
Living with parents in childhood				
No	37 (10.7)	14 (37.8)	23 (62.2)	.090
Yes	310 (89.3)	163 (52.6)	147 (47.4)	
Physical activity				
Never	115 (33.1)	52 (45.2)	63 (54.8)	.299
Once a week	85 (24.5)	47 (55.3)	38 (44.7)	
≥2x a week	147 (42.24)	78 (53.1)	69 (46.9)	

Data are number (%).

Table 3. Binary multivariate logistic regression of factors associated with alexithymia (N=347).

Variable	OR (95% CI)	P value
Academic year of study		
Pre-clerkship (2nd, 3rd, 4th years)	1	
Clerkship (5th, 6th years)	0.43 (0.26–0.72)	.001
Grade point average		
A (4.5–5)	1	
B (3.75–4.49)	1.38 (0.83–3.30)	.210
C (3.74–2.75)	0.99 (0.26–3.81)	.991
D (2.74–2)	10.44 (4.24–25.77)	.031
Smoking		
No	1	
Yes	3.52 (1.60–3.34)	.002
History of childhood abuse		
No	1	
Yes	2 (1.20–8.77)	.008
History of psychiatric illness		
No	1	
Yes	14.40 (4.76–21.06)	.013

Model fit measures: Deviance: 430, AIC: 446, R2 (McFadden): 0.106, R2 (Nagelkerke): 0.183.

This study identified smoking as a risk factor for alexithymia, which is consistent with other studies finding a significant association.^{2,10} Students mistakenly use smoking as a coping strategy for stress.³⁰ This may be due to a lack of awareness about alexithymia symptoms. These students may be more prone to mental disorders and substance abuse. Therefore, increasing student awareness about the consequences of smoking might be crucial in reducing the prevalence of alexithymia.

Students who experience alexithymia most likely have negative feelings about their studies and environment, which can affect their academic performance.^{11,21} Similarly, this study found that students who received grades of D experienced more alexithymia than students who received higher grades. This may be due to smoking and a history of mental illness. However,

Faramarzi and Khafri¹⁵ found whether or not a student passed an exam was not predicted by the presence of alexithymia.

Several studies with students have shown that mental disorders significantly decrease as the year of study increases.^{31,32} This might be explained by the fact that students are prone to difficulties adjusting to the new environment at the beginning of their college life. This study found that students pursuing pre-clerkship were more likely to experience alexithymia than students in their clerkship years. Too many lectures and pressure to secure higher marks in the foundation year in order to enter a medical program could be one of the factors more students experiencing alexithymia in the pre-clinical years than in the clinical years. This result is similar to another study.³¹ However, Kulsoom and Ali Afsar³³ found that students in years four and five experienced more stress and mental health problems due to their clerkship training.

Students who have a history of mental illness or childhood abuse are vulnerable to mental disorders and suicidal behaviors.³⁴ Along similar lines, the present study found that alexithymia is associated with a history of psychiatric illness and childhood abuse. These students are reluctant to share their problems with others due to alexithymia. Pragmatically, students with alexithymia have problems expressing their emotions, which may lead to major depressive substance abuse and other mental illnesses.^{4,7,10}

In this study, students who experience alexithymia had more problems in identifying and describing their feelings and emotions compared to students who did not have alexithymia. This finding is consistent with Mason et al³⁵ and Zhang et al³⁶ and is important in indicating that students might not have insight into their problem. As a result, these students may use various harmful coping strategies such as smoking or exhibit harmful behaviors such as suicidal behavior, detachment from society, or a sedentary lifestyle (no physical exercise); they may even discontinue their college studies.³⁴ Thus, psychological consultations for medical students might help in identifying students who are at risk and allow for early intervention.

This study has some limitations. The study was limited to only medical students in their second year to sixth year who were all from a single medical college, which affects its generalizability. Our regression model explained only 10% to 20% of the variability in alexithymia scores. This indicates that there are other influential factors affecting the scores that were not captured by our study, such as depression and anxiety, which might be possible confounding factors.³⁷ Conducting a longitudi-

nal study with a representative sample size will increase the generalizability of the findings and may produce significant differences in other variables that may be related to alexithymia, such as gender, parental marital status, physical activity, and living in a dorm or being a day scholar.

This study found that almost one-third of the study participants were most likely in the category of possible alexithymia (borderline alexithymia). Further study should focus on reassessing these students to determine if the scores may increase or decrease over time. It should be noted that some students who experience alexithymia may recover by using self-help coping strategies, such as through spiritual coping mechanisms. We suggest another study to look for the use of Islamic prayer as a coping mechanism for alexithymia.³⁶

We conclude that the factors of academic year of study, GPA, smoking, history of mental illness, and history of childhood abuse are all significant predictors of alexithymia. Increasing student awareness about alexithymia and its consequences is highly recommended. Screening and providing insight about alexithymia at the beginning of the first semester would be beneficial for preventing the potentially dire consequences of alexithymia, and its association with smoking and mental health disorders. In addition, students should be given information about where they can seek mental help if needed.

Ethics approval and consent to participate

The protocol of the present study was approved by the Research Ethics Committee (REC) of King Abdulaziz University, Jeddah, Saudi Arabia (Reference No. 1835). Written informed consent was obtained and documented from all participants, who were informed about the nature of the study and the confidentiality of their responses.

Availability of data and material

All original data is available in the Department of Family Medicine, King Abdulaziz University, Jeddah, Saudi Arabia. Data used to support the findings of this study are available from the corresponding author upon request.

Disclosure

No part of this article has been presented in any conference proceedings. The manuscript has not been pub-

Table 4. The relationship between alexithymia diagnosis and factor structure of TAS-20.

Factor structure of the TAS-20	n (%)	Mean (SD)	P value
Difficulty identifying feelings			
No alexithymia	48 (13.8)	11.8 (3.0)	<.001
Possible alexithymia	129 (37.2)	16.6 (2.9)	
Alexithymia	170 (49.0)	24.0 (3.3)	
Difficulty describing feelings			
No alexithymia	48 (13.8)	11.5 (2.5)	<.001
Possible alexithymia	129 (37.2)	14.1 (2.2)	
Alexithymia	170 (49.0)	17.3 (2.6)	
Externally oriented thinking			
No alexithymia	48 (13.8)	22.4 (3.5)	<.001
Possible alexithymia	129 (37.2)	20.6 (3.5)	
Alexithymia	170 (49.0)	20.5 (3.4)	

lished previously and is not under consideration for publication in any other journal.

Author contributions

Sami: Created the study design, wrote the introduction, shared in writing the discussion, reviewed the manuscript, and gave final approval of the manuscript; *Saravanan:* Wrote the discussion; shared in the statistical analyses, writing the introduction, and discussion; and gathered references; *Jamil:* Logistics, interpretation and writing of results and discussion, and review and final approval of manuscript; *Mohammed:* Data collection, entry, validation, and coding; shared in writing the introduction; and gathered references; *Ibrahim:* Statistical analyses, results interpretation and writing, writing of discussion, writing and critical review of the manuscript.

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