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PREVALENCE AND DETERMINANTS OF ILLNESS ANXIETY DISORDER AMONG MEDICAL STUDENTS IN KING ABDULAZIZ UNIVERSITY HOSPITAL, SAUDI ARABIA, 2018

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Abstract:

Background: *Illness anxiety Disorder is Highly prevalent among Medical Students and is associated with Functional impairment and psychosocial disability. Given the increasing prevalence of illness anxiety among medical students, it is imperative that we acquire adequate knowledge on this important topic to prevent The Associated distress that may interfere with medical students' studies and enhance the awareness of how it may represent a poorly recognized occupational disorder.*

Objectives: *To identify the prevalence of illness anxiety and its determinants among medical students in King Abdulaziz University, Saudi Arabia, 2018.*

Subjects and Methods: *A Cross-sectional study was conducted including 300 participants randomly selected from All Medical students in the 4th, 5th, 6th academic years at King Abdulaziz University Medical college. A self-administered questionnaire was distributed. Illness anxiety was assessed using The Short Health Anxiety Inventory.*

Setting: *College of Medicine, King Abdulaziz University Jeddah, Saudi Arabia.*

Main Results: *Among the 300 participants, 15.2% of them had IAD. prevalence was higher among 4th year students [21.0%] compared to the 5th year [16.5%], and the 6th year [7.9%, p = 0.018]. In addition, the highest GPA scores [4.5-5] had a borderline significant association [p = 0.051] with IAD prevalence, with higher prevalence among those in high and low GPA categories, compared to those in medium GPA. Increased IAD prevalence was significantly associated with having a previous personal [27.8% versus 12.8%, p = 0.005] or family [40.0% versus 13.6%, p = 0.001] history of a mental health disorder. No other demographic variable was associated with IAD prevalence.*

Conclusion: *Health-related anxiety in medical students is an unrecognized phenomenon in the Saudi academic community. since almost one in every seven medical students experienced illness anxiety symptoms in our sample in Jeddah, it is essential for medical schools to establish a screening scheme that would serve early detection of IAD and offer referral and psychiatric care for the students to prevent the resulting psychosocial disability and functional impairment.*

Keywords: *Illness Anxiety disorder, Medical students, Anxiety, Medicine, Hypochondriasis.*

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INTRODUCTION:

Hypochondriasis is a mental disorder defined as the preoccupation with ones' state of health with a tendency to find disease [1]. Causing a tremendous amount of psychological distress or/and functional impairment for a period greater than six months[2].Illness anxiety disorder is a diagnosis that was derived from the diagnosis hypochondriasis and was introduced with the publication of the Diagnostic and Statistical Manual, Fifth Edition [DSM-5] after the diagnosis of Hypochondriasis was eliminated. Currently, Illness anxiety or health anxiety is one of the entities in the category named somatic symptom disorders in the DSM-5 [3].Illness anxiety is characterized by an excessive fear of acquiring or having a serious medical condition despite being healthy with a normal physical examination, negative tests, and medical reassurance. Accompanied by insignificant bodily signs or symptoms or none at all [3] Symptoms can range from mild to severe, transient or chronic. But, fear and high levels of anxiety are unchanging and principal elements in the clinical picture [1]. The underlying etiology of illness anxiety disorder is currently still unclear and yet to be understood. However, it takes place within the lifespan and predominately in midlife, and occurs approximately equally in both genders [3].

By reviewing the literature, the prevalence of hypochondriasis in the general population was between 0.4%, to 13% And, the prevalence of illness anxiety disorder was between 0.1 to 5.7% [5]. [3]. [6]. [7]. Illness anxiety and illness fear behaviors have been linked to concentrated exposure to detailed medical knowledge. Not less than 70% of medical students suffer from it at one time or another during their undergraduate years [1, 8]. In the early 1960s, the term "Medical students'" disease [MSD] was theorized and was defined as the development of either symptoms or hypochondriacal fears and thoughts of the disease being studied by the student [9]. Many terminologies have been given to this disorder but, it's been widely referred to as [MSD], health-related anxiety or hypochondriacal concerns [9-11]. Based on the literature, many papers argued the increase in the prevalence of hypochondriasis and the causality between being a medical student and developing health-related anxiety with prevalence rates reaching 78.8% [9].Conversely, other studies revealed their decimal results [12]

In a recent study conducted in Saudi Arabia in 2013, the overall prevalence of hypochondriasis among King Saud university medical students was 3.4% [13]. Whereas The overall prevalence among medical students in Pakistan was 11.9% [14]. Functional impairment and psychosocial disability have been a well-known outcome among individuals with illness anxiety. Therefore, illness anxiety may represent a poorly recognized occupational disorder [16]. This study seeks to identify the prevalence of illness anxiety and its determinants among medical students in King Abdulaziz University in 2018.

SUBJECTS AND METHODS:

Study Design:

A Descriptive cross-sectional study was conducted from December 2018 to February 2019 at King Abdulaziz University, Jeddah, Saudi Arabia.

Study Population and sampling technique:

This study included all Senior medical students [4th-6th years], College of Medicine, King Abdulaziz University Jeddah. We excluded Students that were absent on the day of data collection, Students who refused to fill the questionnaire and Students with a previously diagnosed mental health disorder.

Sample size:

The sample size was calculated by using the single proportion equation in Raosoft software package[20]. By assuming that the prevalence of illness anxiety among senior medical students is 50 %, the required sample size is 273 students at 95% confidence intervals, and margin of error accepted of 5% ". The sample will be increased to 300 to compensate for drop out. Proportional allocation of the students will be performed using the stratified sampling technique. The

sample size will be distributed among the three years' medical students and between male and female students and determined as a percentage proportionally related to the total number of the students in the college of medicine. The total number of students in the faculty of Medicine is 933 and sample size=300 [32.2%].

Data Collection tool [instrument]:
A specially designed questionnaire was used to collect socio-demographic variables including patients age, gender, marital status, nationality, income, smoking history, place of residence, living arrangement, academic year, GPA, number of children, past medical history. Illness anxiety disorder among students was evaluated using The Short Health Anxiety Inventory [SHAI] , It was described and published in Psychological Medicine in 2002[21].
It includes four sections, the main section items 1- 14: symptoms of hypochondriasis, the second section items 15- 18: questions about peoples' attitude towards getting ill. Two additional subscales were included to measure reassurance seeking and avoidance behaviors.

Data Collection Technique:
The researcher [with the help of other professional data collectors] distributed the questionnaire. Questionnaires distributed to the groups after they finished their academic sessions. The researcher [or a data collector] was available to clarify any questions, and the questionnaires were collected on the same day.

Data Entry and Analysis
Data analysis was done using statistical package for the social sciences version 20 [SPSS, 20] software. Descriptive statistics were performed in the form of frequencies and percentage for normally distributed data while median and range were used for abnormally distributed data. Analytic statistics was done using the chi-square test to assess the association and or difference between categorical variables. Binary logistic regression was carried out to identify predictors of being categorized with illness anxiety disorder. Statistically significant P-value was considered if less than 0.05.

Ethical Considerations:
The study protocol and questionnaire were approved by The Joint Program of Family & Community Medicine Ethics committee and King Abdulaziz University Research and Ethics committee, permission to conduct the research was obtained. Written consents from all participants were obtained. Confidentiality was assured and maintained. Students with mental illness or the risk of self-harm were referred to the hospital psychiatric department for counseling

RESULTS:

Demographics of A total of 329 students that responded were [52.9% females, 97.6% Saudis]. Majority were single [97%], non-smokers [87.2%], and lived in Jeddah [94.8%] with their family [90.9%]. Approximately one-third of the students were enrolled in either the 4th, 5th, or 6th academic years and most of them [95.7%] had a grade point average [GPA] of 3.5 or higher. Regarding medical history, 17% of the participants had a chronic disease and 6.1% of them were diagnosed with a mental illness. Over three-quarters of the participants' parents were married [85.8%], own a house [77.2%], and had a monthly income of >10000 SR [83%] [Table 1].

Among all participants, 50 students had IAD [SHAI score $\geq$ 18], resulting in a prevalence of 15.2% [95%CI=11.5%, 19.5%]. IAD prevalence was higher among 4th year students [21.0%] compared to the 5th year [16.5%], and the 6th year [7.9%, p = 0.018]. In addition, the highest GPA scores [4.5-5] had a borderline significant association [p = 0.051] with IAD prevalence, with higher prevalence among those in high and low GPA categories, compared to those in medium GPA. Increased IAD prevalence was significantly associated with having a previous personal [27.8% versus 12.8%, p = 0.005] or family [40.0% versus 13.6%, p = 0.001] history of a mental health disorder. No other demographic variable was associated with IAD prevalence. Interestingly, students with a history of mental disorder had significantly higher SHAI scores when compared to their counterparts [15.55 [6.24] versus 11.54 [6.24], respectively, p =0.001 [Table 2]

Three risk factors of IAD were identified by the multivariate logistic regression model. By considering the 6th academic year as a reference variable, being in both the 4th and 5th academic years were significant risk factors of IAD prevalence [OR=3.69, p=0.004 and OR=2.53, p=0.048, respectively]. Furthermore, having a previous personal history [OR=3.39, p=0.023] or a family history [OR=2.99, p=0.007] of a mental disorder were significant predictors of IAD [Table 3]

Using an independent-samples median test, the median avoidance scores were significantly higher in males compared to females [median = 6 versus 3, respectively, p < 0.001] and students with a familial monthly income of <3000SR [median = 14 versus 6 and 4 for 3000-10000SR and >10000SR, respectively, p < 0.001]. Parental marital status was the sole

significant factor associated with reassurance scores, where higher median values were reported in students with married as compared to students with divorced parents or widows [median = 11 versus 8.5 and 9.5, respectively, p = 0.036, [Table 4].

DISCUSSION:

Transient symptoms of health-related anxiety are well-documented in medical students. These populations face several challenges owing to their comprehensive curricula. Anxiety due to health-related concerns comprises a disorder which has been described as multiple terms in the literature, including "health-related anxiety", "hypochondriasis", "medical students' disease" or IAD [11, 22-24]. In the current study, we showed an overall IAD prevalence of 15.2% among medical students from three different academic grades. The disorder was increasingly prevalent among students of the 4th year and those with a personal and family history of a mental disorder as compared to their counterparts. The prevalence of health-related anxiety among medical students showed variable rates in the literature. Globally, higher rates were consistently reported in multiple regions. Symptoms of medical student syndrome were prevalent among 30% of medical students [n=215] in The Netherlands[25]. Significantly higher rates were apparent in early studies conducted by Hunter et al.[1] and Woods et al.[9], where 70% and 78.8% of students experienced health-related anxiety, respectively. On the other hand, lower rates were reported among 513 students in Pakistan [11.9%] [26], 60 students in USA [8.3%] [27], and 449 students in the United Kingdom [8.2%] [28]. On the regional level, hypochondriasis was reported in 16% of Iranian medical students [29], 9.3% among medical students in the United Arab Emirates [30], and 7.3% among 3rd-year medical students in Egypt [31].

Studies concerning IAD prevalence in Saudi Arabia provided also patterns of variations. For instance, the prevalence was 17.4% among female medical students of pre-clinical and clinical years at Taif University [32]. As compared to our figure, lower rates were reported in King Saud University, where 3.4% of students [from the 1st to 4th academic years] had symptoms of hypochondriasis based on the Diagnostic and Statistical Manual of Mental Disorders-IV criteria [33].

From another perspective, some studies revealed differences between the rates of hypochondrial concerns among medical students and those studying nonmedical curricula. Nonmedical controls have shown higher rates of health-related anxiety as compared to medical students as revealed by Singh et al. [28]. Therefore, it is possible that medical education might reduce hypochondriacal concerns rather than causing them. However, Kellner et al.[27] demonstrated that there was no differences in health-related anxiety between medical and nonmedical students. Similarly, Waterman and Weinman[11] emphasized the lack of significant evidence to support increase of IAD prevalence and impression that medical students would have more hypochondriacal concerns as well as reassurance-seeking behaviors than their peers from nonmedical fields.

Generally, the contradictory observations and conclusions might be attributable to variations in research methodology, using different medical curricula, and different psychological scales for assessment in these studies. The rates in Saudi Arabia seem to be acceptable in comparison to those reported in other areas. According to Moss-Morris and Petrie[22], IAD symptoms can develop based on two main components: the perceptual–cognitive component and the emotional–apprehensive component. While the former is related to developing a pattern of a particular illness in the student due to cumulative learning about it, the latter component is probably developed when the student believes that he/she is ill. Early evidence indicated that the perceptual–cognitive component advances with extensive medical education and it accumulates with further clinical experience in higher academic grades as a partial constituent of a cognitive logical process [22]. However, the patterns of the progression of the second distressing component were contradictory in the relevant studies. Indeed, the emotional–apprehensive component is of relevance to disease symptoms and the variation in its onset could contribute to differences in disease presentation patterns among different academic years.

Our results showed an increased tendency of the 4th grade students to experience IAD symptoms during the past six months when compared to their counterparts of the 5th and 6th grades. This was inconsistent with the results of Azuri et al.[23] who found that the 1st-year students are more likely to visit a primary care physician or a specialist due to their symptoms as compared to the remaining years of study. These outcomes were based on their responses to the medical student's disease [MSD] perception scale and the MSD distress scale regarding their cognitive-perceptual and emotional–apprehensive aspects during the past 12 months of the study [23]. However, the authors revealed that the emotional-apprehensive component was remarkably increased at the beginning of the clinical years and it was relatively decreased later despite its insignificant difference to

baseline values [23]. Paradoxically, Moss-Morris and Petrie[22] found that the distressing component was higher among the students of the 1st academic year as compared to the 3rd year. Furthermore, Sing et al.[28] showed a significant reduction of health anxiety among students during the clinical years, which is concordant with observations from the present study.

Nonetheless, based on our findings and other supportive evidence, one can conclude that while the cognitive component increases progressively from earlier years [juniors] of medical study to older years, the distress component is more pronounced at the middle of medical studies [the 4th academic year] and it becomes less significant in during senior years. Likewise, Althagafi et al.[32] showed that health anxiety was highly prevalent during pre-clinical years than clinical years of study. A possible explanation of these findings is that constant learning of new diseases throughout the academic years and advanced medical knowledge would sustain the cognitive component, yet, students experience a state of "maturity" which progresses during clinical years with further understanding and attaining more comprehensive disease pictures that earlier years [26]. Moreover, hypochondriacal concerns and health-related anxiety in medical students can be reduced due to the development of coping mechanisms which progress towards senior years. Students at higher academic medical years would have sufficient bases and more correct interpretations of the signs and symptoms of diseases under study. This might explain the significant reduction of anxiety symptoms during clinical years despite increased medical knowledge about additional diseases. Furthermore, this supports the significantly higher mean SHAI scores reported in our study among students of the 4th year when compared to those of the 5th and 6th academic years. The core factor of developing IAD symptoms is the way by which students can interpret their symptoms as signs of disease and its association with their progressive medical knowledge and clinical experience.

Regarding Other Demographic Factors Associated with IAD in the current work, we showed that the existence of a positive history of a mental health disorder was associated with hypochondriacal concerns and health-related anxiety. To the best of our knowledge, such an association has been reported only in one study conducted in the United Arab Emirates among 193 undergraduate medical students [30]. The authors revealed that students with IAD had significantly higher SHAI scores [$p < 0.001$] and higher rates of previous histories of mental health disorders when compared to students without hypochondriacal symptoms [$p = 0.50$]. It has been demonstrated previously that medical students with a history of psychological treatment tend to pursue an advanced degree in psychotherapy and they might exhibit some degrees of psychological distress [34]. In addition, students planning to major in psychology are more likely to have personal and familial concerns about the overall psychological functioning than those not planning to major in psychological specialties [34]. As such, importantly, psychiatric morbidity is expectedly higher following the completion of clinical psychiatry rotation [35]. As for other factors, in contrast to our results, there was a significant gender-based difference in IAD prevalence elsewhere in the literature. Females were subject to health-related concerns in Egypt[31] and Iran[29].

Reassurance of hypochondriacal concerns was more likely by asking family members or self-checking in our study. These findings emphasize that the responses of students may be affected by fear of stigma, such that they preferred to consult family members rather than asking their medical tutors. In addition, the increased reliance on self-checking may eventually attract the attention to a recent popular avenue for accessing medical information, which is the internet. Nonetheless, we were unable to assess the impact of searching the internet as a source of assurance of symptoms. With more frequent access to social media and mobile applications, students might seek diagnostic information via online routes, which is known as "cyberchondria" [36]. Recent evidence has shown that cyberchondria, as assessed by the Cyberchondria Severity Scale, is positively associated with several self-report parameters of health-related anxiety as well as distress and excessiveness dimensions, which are correlated with anxiety [37-40]. This was more evident among health science students, who were more concerned about cyberchondria and health anxiety in the presence of a personal health problem as revealed in a Turkish study [41]. Therefore, it is plausible to investigate the recently introduced concept of cyberchondria in medical students and its relation to IAD in future studies.

Treatment-seeking behaviors in medical students might also be affected by their patterns of reassurance. Medical students did not have sufficient time to seek medical advice and treatment on a regular basis. It is possible also that medical training at the senior years provided a degree of confidence in reaching a diagnosis and further management. Thus, students would seek medical care only with heightened symptoms detection.

The used questionnaires in the present study showed good levels of internal consistencies, as indicated by Cronbach's alpha levels ranging between 0.803 and 0.850. Sample size was calculated statistically based on the target population and thus can be representative of the total population in Jeddah. However, this study has some limitations. The cross-sectional nature of this study may raise some concerns in explaining causation. Students were enrolled from a single university in the medical field in Jeddah; which might hinder efficient generalization of the reported outcomes to other areas in Saudi Arabia, which entail other cultural and social causal factors. Furthermore, we were unable to investigate the experiences of students regarding symptom perception, appraisal and own decisions for seeking further medical care.

CONCLUSIONS:

Health-related anxiety in medical students is an unrecognized phenomenon in the Saudi academic community. It may be clinically important since almost one in every seven medical students experienced illness anxiety symptoms in our sample in Jeddah. Medical curricula and personal interpretation of studied diseases, as perceived by the students, play important roles in the development of this syndrome along the course of medical education from juniors to seniors. Individual experiences of medical students, including educational and psychological aspects, have been implicated in health-related concerns. This could be apparent in students with a personal or familial history of a mental illness. In the Saudi context, there is a lack of perception regarding the importance of consulting a physician/psychiatrist about hypochondriacal concerns, as indicated by the low reassurance scores of and high avoidance scores for consulting a physician.

Recommendations:

Most of the mentioned limitations could be resolved by conducting prospective longitudinal studies, which assess health-related concerns and reassurance behaviors in medical students. Moreover, the inclusion of nonmedical students as controls can provide robust comparative assessments to reveal the burden of IAD throughout different academic years. The associated symptoms, thoughts, emotional responses, and concerns as well as the willingness to consult a physician could be tested. Interestingly, the association between health-related anxiety and cyberchondria should be investigated. Finally, a plausible approach is to examine the cognitive and distress components of IAD separately is warranted.

Tutors should be aware of the patterns of IAD development along the course of medical education, emphasizing the peak of these symptoms during the 4th academic years, which would possibly be reduced with further clinical experiences of students. Adequate and targeted awareness programs should be implemented to educate students about this relatively common disorder during their training. Furthermore, students should be approached empathetically and counselled adequately following the exclusion of any potential organic causes of their illness.

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Table 1: Participants' characteristics.

Parameter	Category	N	%
Gender	Female	174	52.9
	Male	155	47.1
Nationality	Saudi	321	97.6
	Non-Saudi	8	2.4
Marital status	Single	318	97.0
	Married	10	3.0
	Divorced	0	.0
Number of children	None	325	98.8
	One	4	1.2
	More than one	0	.0
Academic year	4th	124	37.7
	5th	91	27.7
	6th	114	34.7
GPA	4.5-5	129	39.9
	3.5-4.49	180	55.7
	2.5-3.49	14	4.3
	<2.5	0	.0
Are you a Smoker?	Yes	37	11.3
	No	285	87.2
	Ex-smoker	5	1.5
Parent's Marital status	Married	278	85.8
	Divorced	22	6.8
	Widow	24	7.4
Monthly family income	<3000SR	7	2.2
	3000-10000SR	48	14.8
	>10000	269	83.0
Place of Residence	Jeddah	311	94.8
	Other	17	5.2
Living situation:	With family	299	90.9
	With friends	9	2.7
	Alone	21	6.4
Housing	Owned house	254	77.2
	Rented house	58	17.6
	Student dormitory	17	5.2
Positive Family history of mental health disorder?	Yes	54	16.5
	No	274	83.5
Personal history of mental health disorder?	Yes	20	6.1
	No	309	93.9
Personal history of any chronic illness?	Yes	56	17.0
	No	273	83.0

GPA: Grade Point Average

Table2: The association between demographic data and SHAI score and prevalence of illness anxiety disorder

Factor	Category	SHAI score				Diagnosed Anxiety [N=50]		
		Median	Mean	SD	p-value[1]	n	[%]	p-value[2]
Gender	Female	11.00	11.80	6.21	0.475	27	[15.5]	0.864
	Male	12.00	11.75	6.43		23	[14.8]	
Nationality	Saudi	12.00	11.84	6.31	0.727	50	[15.6]	0.225
	Non-Saudi	8.00	9.38	5.93		0	[.0]	
Marital status	Single	12.00	11.94	6.30	0.108	50	[15.7]	0.173
	Married	6.50	6.70	4.42		0	[.0]	
Number of children	None	12.00	11.86	6.30	0.133	50	[15.4]	0.394
	One	5.00	5.25	1.50		0	[.0]	
Academic year	4th	14.00	13.44	6.46	0.000*	26	[21.0]	0.018*
	5th	12.00	12.00	5.97		15	[16.5]	
	6th	9.50	9.80	5.87		9	[7.9]	
GPA	4.5-5	13.00	13.05	6.44	0.003*	27	[20.9]	0.051
	3.5-4.49	11.00	10.81	5.99		20	[11.1]	
	2.5-3.49	13.00	13.43	7.59		3	[21.4]	
Smoking Status	Yes	9.00	10.81	7.66	0.601	9	[24.3]	0.72
	No	12.00	11.81	5.97		39	[13.7]	
	Ex-smoker	17.00	19.80	9.20	0.406	2	[40.0]	
Parent's Marital status	Married	12.00	11.82	6.19		40	[14.4]	0.948
	Divorced	9.00	10.77	7.35		3	[13.6]	
	Widow	12.00	11.63	5.90		4	[16.7]	
Monthly family income	<3000SR	15.00	16.00	9.64	0.277	3	[42.9]	0.091
	3000-10000SR	11.50	12.23	5.80		9	[18.8]	
	>10000	11.00	11.61	6.33		38	[14.1]	
Place of Residence	Jeddah	11.00	11.70	6.28	0.979	45	[14.5]	0.095
	Other	12.00	13.00	6.96		5	[29.4]	
Living situation	I live with my family	12.00	11.92	6.32	0.515	46	[15.4]	0.933
	I live with my friends	12.00	11.44	6.46		1	[11.1]	
	I live alone	10.00	9.90	6.07		3	[14.3]	
Housing	Own a house	12.00	11.81	6.36	0.465	38	[15.0]	0.838
	Rented house	11.50	12.21	6.12		10	[17.2]	
	Student dormitory	9.00	9.82	6.02		2	[11.8]	
Positive Family history of mental health disorder?	Yes	13.00	13.02	6.82	0.275	15	[27.8]	0.005*
	No	11.00	11.53	6.19		35	[12.8]	
History of mental health disorder?	Yes	14.50	15.55	6.24	0.01*	8	[40.0]	0.001*
	No	11.00	11.54	6.24		42	[13.6]	

GPA : Grade Point Average; * statistically significant result [$p<0.05$; test used: [1] independent samples median test, [2] chi square test

Table *3*: Predictors of Illness Anxiety Disorder

Predictor	Level	OR	p-value
Academic Year	4th	3.69	.004*
	5th	2.53	.048*
	6th	Ref	.014*
Positive Family history of a diagnosed mental health disorder	Yes	2.99	.007*
Positive Personal history of a diagnosed mental health disorder	Yes	3.39	.023*

OR: Odd ratio; CI: confidence interval; Ref: level used as reference category for the regression model; * statistically significant result [p<0.05].

Table 4: Factors associated with the avoidance behavior and the reassurance score.

Factor	Category	Avoidance Score		Reassurance Score	
		Median	P	Median	P
Gender	Female	3	0.000*	11	0.988
	Male	6		10	
Nationality	Saudi	4	0.740	11	0.425
	Non-Saudi	2.5		9	
Marital status	Single	5	0.113	11	0.987
	Married	0.5		9.5	
Number of children	None	4	NA	11	NA
	One	2.5		4.5	
Academic year	4th	5	0.414	11	0.289
	5th	5		12	
	6th	3		10	
GPA	4.5-5	4	NA	11	NA
	3.5-4.49	4		11	
	2.5-3.49	5		9.5	
Are you a Smoker?	Yes	5	0.373	8	0.068
	No	4		11	
	Ex-smoker	9		9	
Parent's Marital status:	Married	4	0.208	11	0.036*
	Divorced	2		8.5	
	Widow	5		9.5	
Monthly family income	<3000SR	14	0.001*	11	0.230
	3000-10000SR	6		12	
	>10000	4		10.5	
Place of Residence	Jeddah	5	0.345	11	0.366
	Other	4		13	
Living situation	With my family	4	NA	11	NA
	With friends	2		12	
	Alone	6		14	
Housing	Own a house	4.5	NA	11	NA

	Rented house	5		11	
	Student dormitory	4		11	
Positive Family history mental health disorder?	Yes	4.5	NA	11	NA
	No	4		11	
Personal history of mental health disorder	Yes	4.5	0.959	10	0.714
	No	4		11	
Personal history of chronic illness	Yes	3	0.943	11	0.946
	No	4		11	

* Statistically significant result [p<0.05]. GPA Grade Point Average; test used: Independent-Samples Median tests.