ORIGINAL ARTICLE

Prevalence of Generalised Anxiety Disorder among Urban Omani Patients Attending Primary Care Centres: A Cross-Sectional Study

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ABSTRACT

Background: Anxiety disorders are common mental health illnesses in primary care. Undiagnosed and thus untreated mental disorders can interfere with the patient's quality of life, ultimately resulting in poor daily functioning, a greater number of doctor consultations, and increased disability.

Objective: The objective of this study was to determine the prevalence of generalised anxiety disorder (GAD) among an urban adult Omani population as well as associated sociodemographic and clinical variables.

Methodology: This study utilised a cross-sectional design and was performed between December 2019 and January 2020. A total of 250 Omani patients were recruited from eight randomised government-funded primary care centres in Muscat, Oman. The prevalence of GAD among the participants was determined by utilising an Arabic version of the validated 7-item General Anxiety Disorder tool delivered during face-to-face interviews.

Results: Total 250 patients were enorlled into the study with mean age of 34.3 ± 10.1 years. There was equal number of male and female participants. Overall, a total of 33 patients had GAD (13.2%). According to the univariate analysis, a personal history of anxiety ($P = 0.001$), chronic medical illnesses ($P = 0.025$), low monthly income ($P = 0.018$), divorced individuals ($P = 0.015$), and housewives with extra part-time employment ($P = 0.032$) were significantly associated with GAD. However, only the absence of a personal history of anxiety ($P = 0.001$), and high monthly income ($P = 0.002$) remained a statistically significant protective factor against GAD in the multivariate analysis.

Conclusion: We found a high prevalence of GAD among an adult urban Omani population. Moreover, certain clinical and sociodemographic variables were found to be significantly associated with the disorder, including a personal history of anxiety and low monthly income. The quality of life of Omani GAD patients may be improved *via* rapid screening of the general population.

Keywords: *Psychiatric Illness, anxiety disorders, generalized anxiety disorder scale, prevalence, public health, primary health care, Oman.*

INTRODUCTION

The World Health Organization (WHO) consider mental health disorders to be one of the predominant causes of disability; three out of every 10 people worldwide have or will develop a mental disorder during their lifetime, especially between the ages of 15 and 44 years [1]. Accordingly, the 2013–2020 mental health action plan published by the WHO agreed on the urgent need for an evidence-based effort to improve mental health [1]. In particular, anxiety disorders are common mental health disorders that can interfere with the patient's quality of life, ultimately resulting in poor daily functioning, a greater number of doctor consultations, and increased disability. As per a recent review of epidemiologic research in Europe, between 1.7–3.75% of cases of anxiety displayed a level of functional impairment comparable to that associated with major depression [2]. However, such disorders usually go unrecognised and thus untreated [3].

The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) classifies anxiety disorders as a spectrum of conditions characterised by inordinate dread, anxiety, and associated behavioural problems [4]. These include generalised anxiety disorder (GAD), panic disorder, agoraphobia, substance/medication-induced anxiety disorder, separation anxiety disorder, selective mutism, social anxiety disorder (or phobia), unique phobias, and anxiety disorder due to other medical conditions [5]. Of these, GAD is one of the most common, with a prevalence of approximately 1.6–5.0% in the general population [6].

Although these feelings can become more intense in specific circumstances, patients with GAD experience persistent unfocused worry and anxiety unrelated to the occurrence of any recent stressful events [7]. Sensations of being in danger, restless, having difficulty concentrating, and feeling irritable and tense are characteristic of the disorder, as well as symptoms such as sleep disturbances, palpitations, tremors, fatigue, xerostomia, and perspiration. Instead of being considered separate complaints, these symptoms are considered components of the syndrome [7]. Usually,

GAD is caused by multiple factors related to the daily life of the patient, including financial, health, and family-related concerns [8].

In Saudi Arabia, the frequency of minor mental disorders including anxiety disorders among adults was found to be 18.2%, with such disorders being significantly more common among women, divorcées, widows, and patients with chronic illnesses [9]. A similar study conducted in Qatar found that anxiety disorders were the second most frequent type of psychological illness after depression, with a prevalence of 17.3%; the researchers similarly found such disorders to be significantly more common in women [10]. In Bahrain, the frequency of GAD was 17.3% [11]. However, there is currently no information available concerning the frequency of anxiety disorders in Oman, and the annual health report released by the Ministry of Health does not include data related to anxiety disorders.

This is the first cross-sectional study that we know of that aims to identify the prevalence of anxiety disorders in an urban adult Omani population attending primary health care centres (PHCCs). Further, this study sought to assess relationships between GAD and selected sociodemographic and clinical factors. The findings of this study may be useful to help policy planners adopt new strategies at the primary care level for prompt detection and early intervention, thereby improving the quality of life of this population.

METHODS

This study was conducted using a cross-sectional design between December 2019 to January 2020. The setting involved a random selection of governmental PHCCs in the Muscat Governorate. This region of Oman has a total of 30 PHCCs located in six wilayats (districts). Of these, eight centres were randomly selected using a computer-based randomisation technique. A systematic random sampling strategy was employed; every second adult Omani patient aged 18–60 years of either gender who attended the general walk-in clinics of these PHCCs for a variety of reasons was enrolled in the study. The exclusion criteria consisted of deaf or mute patients, pregnant or postpartum women within <6 months of giving birth, and patients known to have major mental illnesses or mental retardation.

Using a previously reported GAD prevalence of 17.3–22.3% in other Arabian Gulf countries, 250 patients were determined to be the required sample size for the present study [9-12]. The presumed prevalence rate for anxiety disorder was 18%, with an acceptable variation of 5%. The sample size was ascertained as per the below equation [13]:

$$n = DEFF \ \times \frac{(N \times p) \times (1 - p)}{\dfrac{d^2}{z21 - \dfrac{a}{2}} \times (N - 1) + p \times (1 - p)}$$

Where *DEFF* is the design effect, *N* is the population size, *p* is the estimated proportion, *d* is the margin of error, and z is that standard normal value at alpha level of 0.05

Relevant data were collected from the participants over eight weeks using face-to-face interviews. An Arabic version of the 7-item General Anxiety Disorder (GAD-7) questionnaire was adopted [6]. The original GAD-7 questionnaire, based on criteria proposed by the DSM-5, is a valid and reliable tool for anxiety screening. The tool covers seven specific symptoms and signs, including: (1) feeling nervous, apprehensive, or tense; (2) an inability to cease or curb worrying; (3) worrying excessively about a wide range of concerns; (4) difficulty relaxing; (5) restlessness to the point that it is difficult to remain still; (6) getting rapidly upset, frustrated, or irritated; and (7) feeling as though a terrible incident may occur [4, 6].

The Arabic version of the GAD-7 used in the present study was verified, translated, and reviewed by two independent psychiatry consultants (see appendix). In addition, a pilot study of 50 Omani adult patients attending randomly selected PHCCs was conducted to evaluate the validity of the translated version. Following previously conducted research, the present study utilised a total capped score of ≥10 to signify the existence of an anxiety disorder [6]. Data gathered from participants during the interviews were cross-referenced for verification with their patient records using the standardised Omani electronic healthcare system.

The Statistical Package for the Social Sciences (SPSS), Version 23.0 (IBM Corp., Armonk, NY) was used for data analysis. Either a chi-squared test or Fisher's exact test was performed to compare categorical variables between groups. Relationships between GAD and various sociodemographic and clinical factors were assessed using univariate analysis. Each statistical test was two-sided. The cut-off for statistical significance was $P < 0.05$. Subsequently, all variables with P values of <0.25 in the univariate analysis underwent multivariable binary logistic regression to calculate odds ratios (ORs) and 95% confidence intervals (CIs).

This study was granted ethical approval from the appropriate committee at the Directorate General of Planning and Studies of the Omani Ministry of Health. All of the participants gave written informed consent for participation following a thorough explanation of the purpose of the study.

RESULTS

A total of 250 participants were enrolled in the study. The mean age (± standard deviation) of the cohort was 34.3 ± 10.1 years (median: 33.0 years), with an equal number of male and female participants (n = 125 each; 50.0%) (**Table 1**). Overall, 33 (13.2%) patients had anxiety according to their total GAD-7 scores. Of these,

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Table 1: Demographic and clinical characteristics of urban Omani adults attending randomly selected primary health centres in Muscat (N = 250).

Characteristic	n (%)
Age in Years	
≤33	130 (52.0)
>33	120 (48.0)
Gender	
Male	125 (50.0)
Female	125 (50.0)
Education Level	
Illiterate	4 (1.6)
Primary	23 (9.2)
Secondary	91 (36.4)
University and above	132 (52.8)
Marital Status	
Single	73 (29.2)
Married	167 (66.8)
Divorced	8 (3.2)
Widowed	2 (0.8)
Presence of Parental Consanguinity	
None	121 (48.4)
First-degree	37 (14.8)
Second-degree	19 (7.6)
Employment Status	
Employed full-time	141 (56.4)
Employed full-time with extra work	16 (6.4)
Unemployed	42 (16.8)
Business owner	14 (5.6)
Housewife full-time	26 (10.4)
Housewife plus part-time employment	3 (1.2)
Retired	8 (3.2)
Place of Work	
Government	103 (41.2)
Private sector	74 (29.6)
None	73 (29.2)
Monthly Income in OMR	
<500	90 (36.0)
500–1,000	101 (40.4)
>1,000	59 (23.6)
Presence of a Family Member with a Major Disability or Illness	
Yes	73 (29.2)
No	177 (70.8)
Personal History of Anxiety	
Yes	8 (3.2)
No	242 (96.8)
Other Health Conditions	
Chronic illness*	53 (21.2)
None	197 (78.8)
Regular Physical Activity	
Yes	157 (62.8)
No	93 (37.2)
Smoking status	
Smoker	21 (8.4)
Non-smoker	93 (37.2)
Consumption of Alcohol	
Yes	2 (0.8)
No	248 (99.2)

OMR = Omani rials. *Including conditions such as diabetes mellitus, hypertension, bronchial asthma, coronary heart disease, *etc.*

13 (39.4%) were males and 20 (60.6%) were females. In contrast, among the 217 patients (86.8%) without anxiety, 112 (51.6%) were males and 105 (48.4%) were females (**Fig. 1**). The mean age of the male and female patients with GAD was 35.3 ± 8.3 and 33.4 ± 9.4 years, respectively.
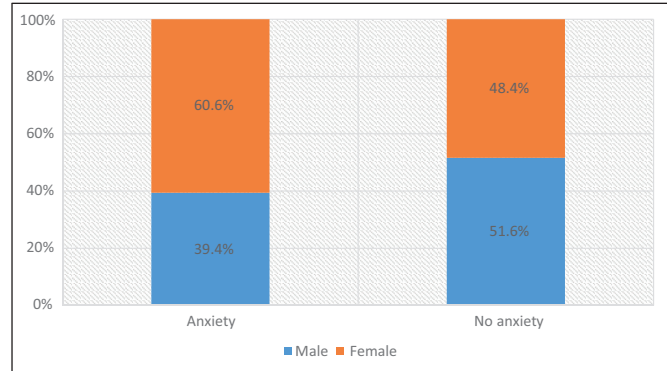
Fig. (1): Chart showing the prevalence of generalised anxiety disorder* according to gender among urban Omani adults attending randomly selected primary health centres in Muscat (N = 250).
*Assessed using an Arabic version of the 7-item General Anxiety Disorder questionnaire [6]. Total scores of ≥10 were considered to indicate the presence of an anxiety disorder.

There was a significant relationship between a personal history of anxiety and GAD (P <0.001). In addition, significant relationships were observed between GAD and low monthly income (P = 0.028), divorced individuals (P = 0.015), and housewives participating in extra part-time employment (P = 0.032). However, there was no relationship observed concerning other sociodemographic variables, such as age (P = 0.419) or gender (P = 0.191). Concerning clinical factors, the presence of a chronic medical illness was the sole variable identified to have a significant relationship with anxiety (P = 0.022). There were no statistically significant relationships noted between anxiety and other clinical factors, such as regular physical activity (P = 0.780), smoking status (P = 0.603), or alcohol consumption (P = 0.580) (**Table 2**).

Table 2: Prevalence of generalised anxiety disorder* according to selected demographic and clinical characteristics among urban Omani adults attending randomly selected primary health centres in Muscat (N = 250).

Characteristic	n (%)		p-value
	Anxiety (n = 33)	No anxiety (n = 217)	
Age in years			
≤33	15 (45.5)	115 (53.0)	0.419
>33	18 (54.5)	102 (47.0)	
Gender			
Male	13 (39.4)	112 (51.6)	0.191
Female	20 (60.6)	105 (48.4)	
Education level			
Illiterate	1 (3.0)	3 (1.4)	0.305
Primary	5 (15.2)	18 (8.3)	
Secondary	14 (42.4)	77 (35.5)	
University and above	13 (39.4)	119 (54.8)	

Characteristic	n (%)		p-value
	Anxiety (n = 33)	No anxiety (n = 217)	
Marital status			
Single	5 (15.2)	68 (31.3)	
Married	25 (75.8)	142 (65.4)	0.059
Divorced	3 (9.1)	5 (2.3)	
Widowed	0 (0.0)	2 (0.9)	
Presence of parental consanguinity			
None	21 (75.9)	100 (70.3)	
First-degree	4 (13.8)	33 (20.0)	0.735
Second-degree	3 (10.3)	16 (9.7)	
Employment status			
Employed full-time	17 (51.5)	124 (57.1)	
Employed full-time with extra work	3 (9.1)	13 (6.0)	
Unemployed	4 (12.1)	38 (17.5)	
Business owner	1 (3.0)	13 (6.0)	0.120
Housewife full-time	4 (12.1)	22 (10.1)	
Housewife plus part-time employment	2 (6.1)	1 (0.5)	
Retired	2 (6.1)	6 (2.8)	
Place of work			
Government	12 (36.4)	91 (41.9)	
Private sector	11 (33.3)	63 (29.0)	0.814
None	10 (30.3)	63 (29.0)	
Monthly income in OMR			
<500	18 (54.5)	72 (33.2)	
500–1,000	12 (36.4)	89 (41.0)	*0.028
>1,000	3 (9.1)	56 (25.8)	
Presence of a family member with a major disability or illness			
Yes	11 (33.3)	62 (28.6)	0.575
No	22 (66.7)	155 (71.4)	
Personal history of anxiety			
Yes	5 (15.2)	3 (1.4)	**<0.001
No			
Other health conditions			
Chronic illness†	12 (36.4)	41 (18.9)	*0.022
None	21 (63.6)	176 (81.1)	
Regular physical activity			
Yes	20 (60.6)	137 (63.1)	0.780
No	13 (39.4)	80 (36.9)	
Smoking status			
Smoker	2 (6.1)	19 (8.8)	0.603
Non-smoker	31 (93.9)	198 (91.2)	
Consumption of alcohol			
Yes	0 (0.0)	2 (0.9)	0.580
No	33 (100.0)	215 (99.1)	

OMR = Omani rials. †Including conditions such as diabetes mellitus, hypertension, bronchial asthma, coronary heart disease, *etc*. *Significant at p<0.05, **Significant at p<0.01

According to the univariate analysis, being divorced (OR: 8.164, 95% CI: 1.498–44.452; P = 0.015), a housewife taking part in extra part-time employment (OR: 14.588, 95% CI: 1.255–169.628; P = 0.032), and having a personal history of anxiety (OR: 0.079, 95% CI: 0.018–0.346; P = 0.001) were significant predictors of GAD; in turn, having a high monthly income (OR: 0.214, 95% CI: 0.060–0.764; P = 0.018) and no chronic illnesses (OR: 0.408, 95% CI: 0.186–0.895; P = 0.025) was significantly protective against GAD. However, following the multivariate binary logistic regression analysis, except for personal history of anxiety (P = 0.001) and high monthly income (P = 0.002), all other variables yielded non-significant results (**Table 3**).

Table 3: Univariate and multivariable analysis of associations between selected variables and generalised anxiety disorder among urban Omani adults attending randomly selected primary health centres in Muscat (N = 250)

Variable	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age in years				
≤33	Ref		-	-
>33	1.353 (0.649–2.822)	0.420	-	-
Gender				
Male	Ref		Ref	
Female	1.641 (0.777–3.465)	0.194	1.74 (0.707–4.289)	0.228
Education level				
Illiterate	Ref		-	-
Primary	0.833 (0.070–9.858)	0.885	-	-
Secondary	0.545 (0.053–5.627)	0.611	-	-
University and above	0.328 (0.032–3.383)	0.328	-	-
Marital status				
Single	Ref		-	-
Married	2.394 (0.878–6.526)	0.088	-	-
Divorced	8.164 (1.498–44.452)	0.015	-	-
Widowed	0.000	0.999	-	-
Presence of parental consanguinity				
None	Ref		-	-
First-degree	0.639 (0.206–1.985)	0.439	-	-
Second-degree	0.989 (0.266–3.681)	0.986	-	-
Employment status				
Employed full-time	Ref		Ref	
Employed full-time with extra work	1.683 (0.435–6.518)	0.451	2.550 (0.571–11.383)	0.220
Unemployed	0.768 (0.244–2.421)	0.652	0.272 (0.071–1.035)	0.056
Business owner	0.561 (0.069–4.564)	0.589	0.627 (0.071–5.564)	0.675
Housewife full-time	1.326 (0.408–4.315)	0.639	0.762 (0.193–3.012)	0.698
Housewife plus part-time employment	14.588 (1.255–169.628	*0.032	3.520 (0.235–52.721)	0.362
Retired	2.431 (0.454–13.028)	0.300	1.472 (0.233–9.284)	0.681

Variable	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Place of work				
Government sector	Ref		-	-
Private sector	1.324 (0.550–3.189)	0.531	-	-
None	1.204 (0.490–2.956)	0.686	-	-
Monthly income in OMR				
<500	Ref		Ref	
500–1,000	0.539 (0.244–1.193)	0.127	0.291 (0.111–0.760)	*0.012
>1,000	0.214 (0.060–0.764)	*0.018	0.089 (0.019–0.424)	**0.002
Presence of a family member with a major disability or illness				
Yes	Ref		-	-
No	0.800 (0.366–1.748)	0.576	-	-
Personal history of anxiety				
Yes	Ref		Ref	
No	0.079 (0.018–0.346)	**0.001	0.045 (0.008–0.258)	**0.001
Other health conditions				
Chronic illness†	Ref		Ref	
None	0.408 (0.186–0.895)	*0.025	0.432 (0.174–1.070)	0.070
Regular physical activity				
Yes	Ref		-	-
No	1.113 (0.525–2.358)	0.780	-	-
Smoking status				
Smoker	Ref		-	-
Non-smoker	1.487 (0.330–6.702)	0.605	-	-

OR = odds ratio; CI = confidence interval; OMR = Omani rails. †Including conditions such as diabetes mellitus, hypertension, bronchial asthma, coronary heart disease, *etc.* *Significant at p<0.05, **Significant at p<0.01

DISCUSSION

The study identified the prevalence rate of GAD to be 13.2% among an urban adult Omani population presenting to primary care settings. Al Khathami and Ogbeide observed a slightly higher rate (18.2%) of minor mental disorders, including anxiety disorders, among 609 patients aged 15–65 years attending PHCCs in Saudi Arabia [9]. Bener *et al.* described a similar proportion (17.3%) of anxiety disorders among primary care patients in Qatar [10]. Similarly, Al Ansari *et al.* indicated the rate of GAD to be 17.3% among 300 patients visiting PHCCs in Bahrain [11]. According to Al-Shehri *et al.*, 22.3% of 822 adult male patients attending 10 random PHCCs in the Dammam and Al-Qatif regions of Saudi Arabia demonstrated anxiety [12].

Rates of anxiety, therefore, appear to be much higher in the Arabian Gulf region compared to Western populations. A large study conducted within a European community showed the prevalence of anxiety to be 1.75–3.5% [2]. However, a study by Kroenke *et al.* performed among 965 randomly selected patients attending 15 PHCCs in the USA revealed that 19.5% had at least one anxiety disorder based on their responses to a self-reported questionnaire [14]. Other researchers from Belgium and Luxemburg have found that the prevalence of GAD ranges from 4.2–8.3% among primary care patients [15]. Different study designs, methodologies, and sample characteristics could account for discrepancies in observed anxiety rates.

In the present study, various sociodemographic characteristics did not significantly influence the frequency of GAD according to the univariate analysis, including age, gender, regular physical activity, smoking/alcohol, education, marital status, presence of parental consanguinity, employment status, place of work, and the presence of family member with major disability or illness. Similarly, Al Ansari *et al.* reported no significant association between GAD and either age, gender, educational level, or employment status among patients attending PHCCs in Bahrain [11]. In contrast, Al-Shehri *et al.* found that the only significant factor associated with anxiety among adult men attending randomly selected primary care centres in Dammam and Al-Qatif was marital status, a factor which was not significant in our study [12]. This difference in findings might be explained by variations in socioeconomic factors, such as monthly income, which was a significant contributor to raised GAD scores in the present study and the only factor which remained significant following multivariate binary logistic regression analysis. In comparison to Saudi Arabia, Oman has a lower gross domestic product, ranking ninth out of all countries in the Arabian Gulf region [16].

Another significant contributor to anxiety is the presence of a chronic medical illness, which was identified to have a statistically significant relationship with anxiety in the current study according to a univariate analysis. However, the multivariate analysis revealed a statistically insignificant relationship. Controversially, Alzahrani *et al.* found the presence of chronic comorbidities resulted in a significant 1.65-fold rise in anxiety among diabetic patients attending five PHCCs in Western Saudi Arabia [17]. Other studies examining a variety of health symptoms have established links between physical ailments and anxiety [18]. In addition, a study with a comparable sample similarly found that patients with diabetes and hypertension recruited from PHCC settings in Saudi Arabia had a high frequency of mental health conditions (57.3%) [19]. Another study of diabetic patients attending eight PHCCs in Malaysia observed that anxiety was strongly predicted by the presence of comorbidities [20].

Although anxiety can be reliably identified and treated in PHCCs, the diagnosis is often missed for primary care patients who present with more than one disorder [7, 21].

In particular, a major significant contributor to anxiety is a previous history of anxiety itself, as noted in the present study. This reinforces the notion that early detection of anxiety is an important factor to provide necessary treatment and care and avoid the development of negative health outcomes [22]. The authors hope that the findings of this study may encourage decision-makers to implement early screening tools to detect anxiety disorders in the Omani population, thereby helping such individuals receive adequate treatment and improving their quality of life, daily functioning, and productivity.

This study's findings should be construed in the context of various limitations. Given that the study was performed in one urban governorate, prevalence results may not be generalisable to other regions of Oman, particularly rural areas. Therefore, further studies may help shed light on regional differences in GAD prevalence. Moreover, the translation of the GAD-7 tool from English to Arabic may have resulted in minor changes in meaning and the definitions of anxiety symptoms. However, great care was taken to ensure that the validity of the original questionnaire was not altered during the translation process.

CONCLUSION

Anxiety has a considerable impact on the quality of life of affected patients. The current study demonstrated an elevated prevalence rate of GAD among an adult urban population in Oman. Moreover, low monthly income and a previous history of anxiety were found to be significantly associated with anxiety in this population. Implementing simple screening measures may help in the detection of anxiety disorders at the PHCC level in Oman, thereby allowing the provision of necessary treatment and care and improving mental health status in the community.

ETHICS APPROVAL

This study was granted ethical approval from the Directorate General of Planning and Studies of the Omani Ministry of Health (#MH/DGHS/DPT/452/2019). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/ or national research committee and with the Helsinki declaration.

CONSENT FOR PARTICIPATION/ PUBLICATION

All of the participants gave written informed consent for participation in the study. The requirement for consent for publication was waived as all data were aggregated and no identifying patient information was included in the manuscript.

AVAILABILITY OF DATA

The raw data for this study are available from the corresponding author upon reasonable request.

AUTHOR CONTRIBUTIONS

AAH, AAG and AAM conducted the data collection and created the original version of the manuscript. SJ performed the data analysis. SAS contributed to the data analysis tools, wrote up the results section, created the tables and graphs, and revised and edited the manuscript. All authors approved the final version of the manuscript for publication.

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