The Role of Ethnicity in Expression, Prevalence, and Severity of Generalized Anxiety Disorder and their Overlap with Depressive Symptoms: Epidemiological Evidence from a Rapidly Developing Middle Eastern Country

Salma M. Khaled (skhaled@qu.edu.qa)
Qatar University https://orcid.org/0000-0002-8844-3441

Monica Zolezzi
Qatar University

Research Article

Keywords: Prevalence, Generalized Anxiety Disorder, Depressive Symptoms, Ethnicity, Migration, General Population, Qatar

Posted Date: July 22nd, 2021

DOI: https://doi.org/10.21203/rs.3.rs-741912/v1

The Role of Ethnicity in Expression, Prevalence, and Severity of Generalized Anxiety Disorder and their Overlap with Depressive Symptoms: Epidemiological Evidence from a Rapidly Developing Middle Eastern Country

Salma M. Khaled[a*] PhD, Monica Zolezzi[b], PhD

[a] Social and Economic Survey Research Institute, Qatar University, Doha, Qatar

[b] College of Pharmacy, Qatar University, Doha, Qatar

Corresponding author

[*]Social and Economic Survey Research Institute, Qatar University, P.O. Box: 2713, Doha, Qatar. T: +974 4403 5754 (direct). Email: skhaled@qu.edu.qa

Abstract

Introduction
Qatar is a small but high-income Middle Eastern country with a large influx of migrants each year. However, the impact of changing population structure and urbanization on prevalence of generalized anxiety symptoms remains unexplored to date.

Materials & Methods
A total of 2,640 participants interviewed by phone using the Generalized Anxiety Disorder (GAD-7) and the Patient Health Questionnaire (PHQ-2). Bivariate and multinomial logistic regression analyses were conducted to explore the associations of ethnicity (Arab versus Non-Arab) with severity and symptom profile of GAD and overlap with depressive symptoms.

Results
The point prevalence of mild, moderate, and severe symptoms were 13.4% (95% CI: 11.9 – 15.0), 2.7% (95% CI: 2.0 – 3.5), and 0.9% (95% CI: 0.6–1.4), respectively. Arab ethnicity was associated with mild GAD (OR=1.78, p=0.009) and moderate-to-severe GAD (OR=2.36, p=0.044). Relative to non-migrants, migrant types were not significantly associated with mild or with moderate-to- severe GAD. Interactions between depressive symptoms and ethnicity were evident and statistically significant for the association with mild GAD versus no GAD (OR=0.34, p=0.003).

Conclusions
Ethnicity moderated the association of depression symptoms and GAD severity, with potential implications for early screening and community intervention.

Keywords
Prevalence; Generalized Anxiety Disorder; Depressive Symptoms; Ethnicity; Migration; General Population; Qatar

Introduction

Anxiety disorders constitute the largest group of mental disorders in most western societies; it is estimated that one in four individuals have experienced an anxiety disorder in their lifetime including generalized anxiety disorder, panic disorder, phobias, social anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder (1-5).

In contrast, epidemiological data on anxiety disorders remain scarce in the Middle East. Only a handful of studies reported the prevalence of anxiety disorders in war-afflicted countries (6, 7); there is also paucity of epidemiological studies from war-free countries Arab countries. Additionally, significant differences in the prevalence rates of these disorders have been reported among different Arabic speaking populations (8).

Comparison in prevalence estimates between cultures is difficult because of differences in language, assessment instruments, and geopolitical or sociodemographic contexts. However, direct comparison in prevalence rates between different cultural groups may be possible within the same country (9). For example, studies in the United States have shown that White Americans were more likely than minority groups to be diagnosed with most anxiety disorders, except post-traumatic stress disorder, which was most prevalent in African Americans (10, 11). However, similar studies in the Arab world are lacking.

A small country in the Arabian Peninsula, Qatar has a unique sociocultural setting with migrants that have very distinct migratory pathways from immigrants to Europe and North America. Qatar's population comprises

mostly of expatriate migrant workers from diverse ethnicities and different socio-cultural backgrounds (12). Migrants of Qatar are predominantly from the Indian subcontinent and various Arab nationalities including Egyptians, Syrians, Jordanians, Lebanese, Palestinians, Tunisians, and people from other Arabian Gulf countries (13). Non-migrants or Qataris, who are also of Arab ethnicity, are a minority in the population of Qatar (14).

Anxiety disorders are the most common among mental illnesses in Qatar's primary care centers (15–17). The lifetime prevalence of generalized anxiety disorder (GAD) reported in this setting ranged between 10.4% (15) and 20.4% (17) and was significantly associated with female and younger age (18 to 34 years). However, generalizability from these studies is limited primarily because only Qataris were included (16). Thus, the role of ethnicity in the epidemiology of GAD symptoms in Qatar including its potential moderating effects on severity and overlap of these symptoms with other psychiatric symptomology such as depression remains largely unstudied.

The role of ethnicity in the epidemiology of GAD is of interest not only for Qatar, but worldwide, because symptoms of GAD that occur with symptoms of other mood disorders such as depression tend to more debilitating and resistant to treatment compared to GAD symptoms that occur on their own (18). Understanding the role of ethnicity in these associations may largely uncover cognitive/ behavioral culture-specific mechanisms (e.g. patterned interpretations or reactions to stressors) that may underlie the expression (types or profile of symptoms most commonly presented) or the development of generalized anxiety symptoms (19), and their overlap with other mood-related symptoms.

By using a relatively brief measure, the current study aimed to estimate the point prevalence and severity of GAD symptoms in the general population of Qatar and compare its distribution across ethnicity, socio-demographics, migration-, work-, and health-related characteristics in this population. To explore the potential role of ethnicity as a moderator of the associations between severity of GAD and depression symptoms was the secondary aim of this study.

Materials & Methods

Study Sample

Briefly, a representative sample was drawn from a comprehensive frame of cellphone numbers in Qatar using a list-based probability dialing technique (20). A systematic stratified sample was drawn separately for migrants and non-migrants; weights were constructed to adjust for nonresponse and sampling disproportionality (as non-migrants were the minority and had to be oversampled). The total target sample of completed interviews was 2,252 (see Appendix I) or approximately 750 interviews per group, which was calculated using standard sample size formula for complex survey design (21, 22) allowing for statistically adequate comparisons at the 5% significance level between the main three population groups in Qatar: Low-Income Migrants (LIMs), High-Income Migrants (HIMs), and non-migrants or Qatari Nationals (QNs).

Data Collection

After obtaining approval of Qatar University's Institutional Review Board (Reference number: 264- E/13), the interviews were conducted over the phone by trained interviewers at the Social and Economic Survey Research

Institute of Qatar University in February of 2018. Verbal consent was obtained from all respondents before starting the interviews.

Translation

The following website (www.phqscreeners.com) provided officially translated versions of the GAD-7 and PHQ-2 free of charge in the following languages: Arabic, Hindi, Malayalam, Tagalog, Tamil, and Urdu. Using internationally accepted translation methodology, the MAPI research institute developed these translated versions (23). The Nepali and Sinhalese versions of the GAD-7 were not available from the same source and were translated by two independent researchers who were fluent in each of these languages and English. The two independent researchers discussed disagreements in translation and resolved these disagreements by consensus for each language.

Measures

GAD Symptoms

The seven-item Generalized Anxiety Disorder (GAD-7) is a relatively brief and well-validated screening measure for severity of GAD symptoms used in both clinical and community samples to date (24). Although not a diagnostic instrument, the GAD-7 assesses the frequency over the past two weeks of the seven symptoms criteria for GAD in the Diagnostic and Statistical Manual of Mental Disorders (DSM) version 5 (24) using the following 4-point response options for each symptom: 0 = “not at all”, 1 = “several days”, 2 = “more than half the days”, and 3 = “nearly every day”. A total GAD-7 score can be generated for each participant with score range from 0 to 21. Cut-off scores of 5, 10, and 15 denote mild, moderate and severe levels of GAD symptoms, respectively (25, 26).Previous studies have shown that GAD-7 exhibits good psychometric properties such as good test–retest reliability of 0.82, internal

consistency or alpha of 0.89 (27-29), and an acceptable sensitivity, but less-than-ideal specificity (24, 27).

In this study, participants were categorized based on these previously established cut-off scores (24) and the distribution of all seven GAD items (dependent variable) in the sample as follows: normal levels = a total score between 0 and 4, mild levels = a total score between 5 and 9, or moderate-to-severe levels of GAD = a total score between 10 and 21. Previous research has shown that the latter levels of severity indexed by a total score of 10 or greater may suggest the need for further evaluation by a health professional (24). For each of the seven items, mild levels of the symptom occurred "several days" in the past two weeks, while moderate-to-severe levels of each symptom occurred "half-of-the-days" or "every day" (24).

Depressive Symptoms

The two-item Physician Health Questionnaire or PHQ-2 was used to measure the frequency of depressed mood and anhedonia in the past two weeks with the following 4-point response options for each symptom: 0 = "not at all", 1 = "several days", 2 = "more than half the days", and 3 = "nearly every day". The total score range for the two items was 0 to 6. In our study, depressive symptoms were modelled as a continuous composite score and as a dichotomous independent variable using a cut-off score ≥ 3 to denote potentially clinically significant depressive symptoms (29,30). Previous studies support that the PHQ-2 has test-retest reliability of 0.79 and internal consistency or alpha of 0.81 (28).

Ethnicity

Respondents were categorized into: Arab, South Asian, South-East Asian and other (including participants from East Asia, Asia other, Africa, Latin America,

Europe, UK, Russia, US, Canada, Australia) based on country of origin and the preferred language for completing the interview (Arabic, Hindi, Malayalam, Tagalog, Tamil, Urdu, Nepali, Sinhalese, and English). These categories were further collapsed into "Arab" and "Non-Arab" as these were the largest two cultural groups that provided sufficient statistical power to conduct the analysis.

Migrant Types

Respondents were classified into one of three main population groups based on self-reported nationality and income. Qatari participants or QNs were classified as non-migrants. All non-Qatari respondents were considered migrants and were either classified as LIMs or HIMs based on their reported income. Participants who had a combined household income of less than $1,100 per month were categorized as LIMs, while those with combined household income greater than $1,100 per month were classified as HIMs. This income cut-off was previously shown to reliably delineate between LIMs and HIMs in Qatar (31).

Other variables

We also collected standard sociodemographic information (age, sex, education, marital status, employment status) during the phone interview. Overall health status as measured on a scale ranging from zero to a hundred (32). Quartiles of health rating scores (including poor, fair, good, and excellent) were generated based on the distribution of these scores in the sample. Participants were also asked if they ever been diagnosed with or told by a health professional that they have any of the following health conditions: 1) Diabetes 2) High Blood Pressure or high cholesterol; 3) Asthma; 4) Heart Disease; 5) Mental or Psychological Problems such as Anxiety, Sleep

Problems or Depression; 6) Cancer or Cancerous Tumors; 7) Disability (physical, visual, hearing) or any other condition (please specify); and 8) Never been diagnosed with any health condition.

Statistical Analyses

We estimated the point prevalence of GAD symptoms using weighted proportions and corresponding 95% Confidence Intervals (CIs). We fitted multinomial logistic regression models to the data and estimated odds ratios (OR) and standard errors (SE) for mild and moderate-to-severe symptoms of GAD relative to no GAD symptoms as a function of each independent variable entered into the model. We ran model diagnostics to assess effects of outliers, influential observations, and violations of model assumptions, including the Suest-based Huasmen test for independence of irrelevant alternative assumption (33). Two-tailed p-values < 0.05 were used to indicate statistically significant results.

Only one potential explanatory variable was entered into each univariable model and the corresponding unadjusted OR was estimated for each level of the dependent variable relative to the baseline level (i.e. normal levels of GAD symptoms or score of 0 - 4). We also fitted a fully adjusted model by simultaneously entering all of the following explanatory variables into the model: sex, age (continuous), current marital status, migrant status, migrant type (LIMs, HIMs), ethnicity, current employment status, education, net household income, current health rating, and ever diagnosed with a chronic health condition. The contribution of each variable to the final or reduced model was assessed using a variety of fit statistics, including the F-adjusted Wald test and the F-adjusted mean residual goodness of fit test.

We tested statistical interactions between ethnicity and depression symptoms for different levels of GAD severity by adding a two-way interaction terms between ethnicity and depression symptoms to the final reduced model. We evaluated the goodness of fit of the reduced final model with and without these interaction terms using the design-adjusted Wald test. To improve the process of interpreting this interaction between ethnicity and depression on GAD-7 severity, the average marginal effects generated from these models were plotted (34).

All statistical analyses were carried out in STATA version 13 and results were weighted to adjust for non-response and unequal probability of selection.

Results

Sample characteristics

Table 1 summarizes the characteristics of this general population sample. A total of 2,640 respondents completed the phone interview. These were participants who were administered the entire questionnaire over the phone without necessarily answering all questions. The majority were males (82.3%), between 25 and 34 years of age (40.1%), married (70.9%), migrants (92.1%) of lower-income status (70.7%), and South-Asian ethnicity (64.2%). The majority of the sample was employed (88.9%) with an average income in the fourth quartile (34.2%) and a post-secondary education (34.1%).

Only 7.2% of the respondents reported having poor health, and 20.8% reported diagnosis with a severe health condition. As representative of the general population of Qatar, males outnumbered females by 4 to 1

, while migrants outnumbered non-migrants by 11 to 1 (https://www.psa.gov.qa/en/Pages/default.aspx). Only 24 respondents did not

answer all seven questions of the GAD scale. With those who did not answer one or more of the seven questions (n=66), these respondents also were excluded from the rest of the analysis.

Overall prevalence estimates of GAD

The prevalence of any GAD symptoms in the past two weeks was 17.0% (95% CI: 15.3 – 18.8). The prevalence of mild, moderate, and severe symptoms were 13.4% (95% CI: 11.9 – 15.0), 2.7% (95% CI: 2.0 – 3.5), and 0.9% (95% CI: 0.6– 1.4), respectively. Table 2 presents estimates of bivariate associations of mild and moderate-to-severe GAD with socio-demographic and other characteristics.

Mild levels of GAD and bivariate associations with explanatory variables

Female (OR=1.70, p<0.001) and Arab ethnicity (OR=2.28, p<0.001) were positively associated with mild GAD, while migrant status (OR=0.52, p<0.001) and migrant type (HIMs: OR=0.76, p=0.054; LIMs: 0.43, p<0.001) were negatively associated with mild GAD relative to non-migrants. Overall, mild GAD was significantly associated with post-secondary education (OR=2.96, p=0.031) and less than "excellent" health rating, including poor health (OR=2.94, p<0.001). Mild GAD was also negatively associated with unemployment (OR=0.48, p<0.001).

Moderate-to-severe levels of GAD and bivariate associations with explanatory variables Like mild GAD, moderate-to-severe levels of GAD (Table 2) was positively associated with female (OR=1.87, p<0.001) and Arab ethnicity (OR=2.07, p=0.003); Similar to mild GAD, migrant status (OR=0.40, p<0.001), migrant type (HIMs: OR=0.43, p=0.002; LIMs: 0.39,

p<0.001), and unemployment (OR=0.47, p=0.008) were negatively associated with moderate-to-severe GAD.

Unlike mild GAD, moderate-to-severe GAD was not significantly associated with post-secondary education (OR=1.74, p=0.533) and only significantly associated with fair (OR=2.75, p=0.003) and poor health (OR=5.71, p<0.001) relative to excellent health rating, respectively. Multivariable regression models with mild and moderate-to-severe relative to normal levels of GAD are shown in Table 3. Results from fully adjusted and final (reduced) adjusted models were largely consistent for mild and moderate-to-severe GAD levels. Therefore, unless otherwise stated, the results described below are from the final models (see Table 3).

Multivariable results for mild levels of GAD

Female (OR=1.37, p=0.001) and Arab ethnicity (OR=1.78, p=0.009) remained positively and significantly associated with mild relative to normal levels of GAD after simultaneous adjustment for other variables, while migrant types were no longer associated with mild GAD relative to non-migrants (HIMs: OR=1.44, p=0.093; LIMs: 1.12, p=0.688). In the fully adjusted model, mild GAD was no longer significantly associated with education, unemployment or income variables. Mild GAD remained positively associated with fair (OR=1.86, p=0.015) and poor (OR=2.12, p=0.012) relative to excellent health rating. Depressive symptoms were significantly associated with mild GAD (OR=2.10, p<0.001).

Multivariable results for Moderate-to-severe levels of GAD

Both females (OR=1.64, p=0.019) and Arab ethnicity (OR=2.36, p=0.044) remained significantly associated with moderate-to-severe levels of GAD after simultaneous adjustment of other variables. Migrant types were no longer significantly associated with moderate-to-severe levels of GAD, though these associations were positive (HIMs: OR=1.41, p=0.350; LIMs: 1.68, p=0.337) in the final model (Table 3). Only poor health relative to excellent health rating remained significantly associated with moderate-to-severe GAD (OR=3.50, p=0.009). Similar to mild GAD, depressive symptoms were significantly associated with moderate-to-severe GAD (OR=3.35, p<0.001).

Differences in GAD symptoms by Ethnicity and Severity Levels

Table 4 summarizes the frequency and estimates of the association between ethnicity and endorsement of specific anxiety symptoms stratified by GAD severity from age- and sex-adjusted models. Irrespective of GAD severity levels, Arabs were significantly more likely to report experiencing feeling nervous, anxious or on edge [Mild: OR=3.40, p<0.001; Moderate-to- severe: OR=3.18, p<0.001], trouble relaxing [Mild: OR=3.39, p<0.001; Moderate-to-severe: OR=5.60, p=0.011], and becoming easily annoyed or irritable [Mild: OR=1.57, p<0.001; Moderate-to-severe: OR=2.28, p<0.001].

Interactive Effects of Ethnicity on Associations between Depression and GAD

We found evidence that the association between depressive symptoms and severity levels of GAD differed by ethnicity. The interactions between depressive symptoms that may be clinically relevant and ethnicity were statistically significant for the association with mild levels of GAD (OR=0.34, p=0.003), but not for moderate-to-severe levels of GAD (OR=0.50, p=0.277).

Similar results were observed when depression was treated as a continuous score.

To aid in interpreting these two-way interactions, Figure 1 presents plots of the population-averaged predicted probability for mild and moderate-to-severe GAD as a function of depressive symptoms among Arabs and non-Arabs. Although the predicted probability of mild GAD for Arabs, on average, was significantly lower than non-Arabs for those who were depressed compared to those who were non-depressed, the opposite effects were observed for moderate-to-severe GAD. The average marginal effect of depressive symptoms for Arabs compared to non-Arabs was a statistically significant decrease in the predicted probability of mild GAD by 15.1% (p=0.029). In contrast, the average marginal effect of depressive symptoms for Arabs compared to non-Arabs increased the predicted probability of moderate-to-severe GAD by 4.1% (p=0.569).

Discussion

The latest reported worldwide lifetime, 12-month, and 30-day prevalence estimates of GAD were 3.7%, 1.8% and 0.8%, respectively (5). Of note, these estimates were derived from community surveys that used the WHO Composite International Diagnostic Interview or CIDI (4) and not the GAD-7. Most of the GAD-7 data come from studies conducted in primary care or outpatient clinics in Europe (35-37). Only three studies validated the use of GAD-7 as a screening tool in general population samples in Lebanon (38). Currently, no population-based data is available for the GAD-7 from the Middle East. The present study is the first to examine the prevalence and severity of GAD symptoms in a relatively large sample of the general

population in Qatar, a rapidly developing and war-free country in the Middle East.

The prevalence of any GAD symptoms in the past two weeks was approximately 17.0% (95% CI: 15.3 – 18.8). The prevalence of GAD symptoms with moderate (GAD-7 score: 10–14) and severe symptom levels (GAD-7 score: 15–21) was 2.7% (95% CI: 2.0– 3.5) and 0.9% (95% CI: 0.6–1.4), respectively. Comparable, but higher estimates of 4.1% (95% CI: 3.5–4.6) and 1.0% (95% CI: 0.7–1.3) were obtained for moderate and severe levels of GAD in a general population sample in Germany using the same instrument and cut-off scores (28).

Overall, our findings in relation to significant associations between GAD and female gender are in line with findings from around the world (1,5, 8,39–41). Depression symptoms were also highly comorbid with GAD symptoms in our study, which is also consistent with what has been reported in the literature (2,5).

Although both types of migrants (HIMs and LIMs) compared to non-migrants were positively associated with mild and moderate-to-severe GAD symptoms in our study, these associations were not statistically significant. In contrast, negative associations between migrant status and GAD were previously reported in Canada and Australia (41, 42). In our final multivariable model, Arab ethnicity rather than migrant status was significantly associated with higher prevalence estimates of mild GAD (OR=1.78) and moderate-to-severe (OR=2.36) versus normal levels of GAD.

In our study, differences between Arabs and non-Arabs in GAD symptoms were mainly due to temperament. Irrespective of severity, Arabs had slightly higher endorsement of temperament-based (e.g., feeling nervous, anxious, or on edge, difficulty relaxing, or being easily upset or irritable) rather than cognitive-based (excessive anxiety or fear that something terrible would happen) symptoms of GAD than non-Arabs.

This finding may further highlight the role of culture in the etiology of anxiety disorders; specific cultural settings may predispose individuals with high levels of certain temperament traits to GAD symptoms. Existing evidence suggests that temperament plays an important role in the development of GAD (43, 44). Specifically, "anxious temperaments" (fearfulness, neuroticism, and negative affectivity) may have genetic ties to anxiety symptoms (45, 46) and the development of anxiety disorders in general (47, 48). Furthermore, a previous epidemiologic study that incorporated temperament assessment alongside the Arabic version of CIDI 3.0 (49) found a significant association among anxious temperament and DSM-IV mood, anxiety, and impulse control disorders in the Arab context (50).

Our results also provide evidence for ethnicity as a potential moderator of the association between depressive symptoms and severity of GAD symptoms. For those who were depressed compared to those who were non-depressed, the predicted probability of mild GAD for Arabs, on average, was significantly lower than non-Arabs. Though not statistically significant, but may be of clinical relevance, we observed the opposite effects in the likelihood of experiencing moderate-to-severe GAD symptoms. Compared to

non-Arabs, depressive symptoms were more closely associated with moderate-to-severe than mild GAD symptoms in Arabs.

These differences in severity levels of GAD symptoms between Arabs and non-Arabs in our study and their differential associations with depressive symptoms may reflect underlying GAD subtypes and require further future investigation to delineate potential clinical significance of these findings.

The present study offered unprecedented epidemiological data on GAD in a relatively large sample of the general population in Qatar using the GAD-7. Nevertheless, the study had many limitations. The study was cross-sectional and the data was based on self-report. Previous history of GAD symptoms was not assessed and limited information on functional impairment was collected. Except for the current status of depressive symptoms, the study did not assess the present and past history of other mental illness, including different types of anxiety. This is a major limitation as GAD is known to be commonly comorbid with other mental disorders. The accuracy of GAD-7 as a screener may be largely compromised in the absence of comorbidity information and in the context of a cross-sectional study design. Furthermore, clinical diagnostic interviews for GAD were not included. Given the very high false-positive rate previously reported for using the GAD-7 as a screener in Arabic speaking outpatient sample (38), future population-based studies should further delineate the specificity of this instrument in follow-up clinical interviews. Although the interview questionnaire was thoroughly translated and administered in the most common languages in Qatar, we could not rule out other sources of response bias for job security reasons in Arab and non-Arab migrants if any underlying mental disorder is identified. In addition, whether the GAD-7 questions measured the same concept and were

associated with the same level of functional impairment in ethnically diverse groups were not verified in our sample. It is also important to highlight that the DSM-5 criteria for GAD diagnosis require the presence of anxiety symptoms for at least six months, whereas the GAD-7 queries only symptoms present within the last two weeks.

Despite these limitations, our study is the first in the Middle East providing population-based data using the GAD-7. Our preliminary findings support the existence of differences between Arab and non-Arab ethnicities on temperament, but not cognitive items of the GAD- 7; better instruments that capture these dimensions of GAD, or the inclusion of comprehensive temperament-assessment scales comprehensive assessment of GAD are needed to replicate these findings in future studies.

Conclusions

Qatar has experienced rapid economic growth, migration, and urbanization in the past three decades; the prevalence estimates of mild and moderate-to-severe GAD symptoms in the general population of Qatar are comparable to estimates previously reported in the Western literature. Findings from this study supported independent associations between ethnicity and GAD. Prevalence of mild and moderate-to-severe GAD symptoms was higher for Arabs than non-Arabs irrespective of migrant status or migrant type. Arab ethnicity was associated with a higher prevalence of temperament-based symptoms of GAD irrespective of symptom severity. Depression symptoms were more closely associated with moderate-to-severe than mild GAD symptoms in Arabs compared to non-Arabs. Future research is needed to provide additional information on subtype of GAD symptoms in general

population samples, which can help tailor screening and interventions for ethnically diverse populations.

Acknowledgements

The Social and Economic Survey Research Institute at Qatar University made this study possible. The statements made herein are solely the responsibility of the authors.

Declarations

Ethics approval and consent to participate: As this was a population-based telephone study, recruitment was done over the phone. Only verbal consent was collected before the start of the interview. Qatar University's Institutional Review Board reviewed and approved this study, including participants' verbal consent acquisition (Reference number: 264-E/13).

Consent to publish: NA

Authors' contributions: SK designed the study and data collection and conducted the data analysis. Both MZ and SK wrote the manuscript. All Authors read and approved the manuscript.

Data availability: The data that support the findings of this study are available from the corresponding author, [author initials], upon reasonable request.

Competing interests: All authors have no competing conflicts of interest to report.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

1. Baxter AJ, Scott KM, Vos T, White ford HA. 2013. “Global prevalence of anxiety disorders: a systematic review and meta-regression”. *Psychol Med.* 43(5):897–910.

2. Kessler RC, Keller MB, Wittchen HU. 2001. “The epidemiology of generalized anxiety disorder”. *Psychiatr Clin North Am*. 24(1):19–39.

3. Kessler RC, Angermeyer M, Anthony JC, DE Graaf R, Demyttenaere K, Gasquet I, et al. 2007.“Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization’s World Mental Health Survey Initiative”. *World Psychiatry Off J World Psychiatr Assoc WPA*. 6(3):168–76.

4. Kessler RC, Ustun TB. 2004. “The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI)”. *Int J Methods Psychiatr Res*.13 (2):93–121.

5.Ruscio AM, Hallion LS, Lim CCW, Aguilar-Gaxiola S, Al-Hamzawi A, Alonso J, et al. 2017.” Cross-sectional Comparison of the Epidemiology of DSM-5 Generalized Anxiety Disorder Across the Globe”. *JAMA Psychiatry* 74(5): 465–75.

6.Alhasnawi S, Sadik S, Rasheed M, Baban A, Al-Alak MM, Othman AY, et al. 2009. “The prevalence and correlates of DSM-IV disorders in the Iraq Mental Health Survey (IMHS)”. *World Psychiatry Off J World Psychiatr Assoc WPA [Internet*]. 8(2):97–109. Available from: https://www.ncbi.nlm.nih.gov/pubmed/19516934

7. Karam EG, Mneimneh ZN, Dimassi H, Fayyad JA, Karam AN, Nasser SC, et al. 2008.” Lifetime Prevalence of Mental Disorders in Lebanon”: First

Onset, Treatment, and Exposure to War. *PLOS Med [Internet]* 5(4):e61. Available from: https://doi.org/10.1371/journal.pmed.0050061

8. Tanios CY, Abou-Saleh MT, Karam AN, Salamoun MM, Mneimneh ZN, Karam EG. 2009." The Epidemiology of anxiety disorders in the Arab world: A review". *J Anxiety Disord [Internet]* 23(4):409–19. Available from:

http://linkinghub.elsevier.com/retrieve/pii/S0887618508001849

9. Hofmann SG, Hinton DE. 2014."Cross-cultural aspects of anxiety disorders". *Curr Psychiatry Rep*. 16(6): 450.

10. Asnaani A, Richey JA, Dimaite R, Hinton DE, Hofmann SG. 2010."A Cross-Ethnic Comparison of Lifetime Prevalence Rates of Anxiety Disorders": *J Nerv Ment Dis [Internet]* 198 (8):551–5. Available from: https://insights.ovid.com/crossref?an=00005053-201008000-00004

11. Grant BF, Stinson FS, Hasin DS, Dawson DA, Chou SP, Ruan WJ, et al. 2005. "Prevalence correlates, and comorbidity of bipolar I disorder and axis I and II disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions". *J Clin Psychiatry*. 66(10):1205–15.

12. De Bel-Air, F. (2017). "Demography, Migration, and Labour Market in Qatar," Explanatory Note No. 3/2017, GLMM, Available from: http://gulfmigration.eu

13. Snoj J.2019. "Population of Qatar by nationality -2019 report". *PRIYA DSOUZA COMMUNICATIONS;* Available from: http://priyadsouza.com/population-of-qatar-by-nationality-in-2017

14. Winckler, O. (2015). How Many Qatari Nationals Are There? Middle East Quarterly, 22(2), 1-16.

Available from: https://www.meforum.org/5081/how-many-qataris

15. Bener A, Abou-Saleh MT, Dafeeah EE, Bhugra D. 2015."The prevalence and burden of psychiatric disorders in primary health care visits in Qatar: too

little time?" *J Family Med Prim Care* 4(1):89-95. doi: 10.4103/2249-4863.152262. PMID: 25810996; PMCID: PMC4367013.1614.

16. Ghuloum S, Bener A, Abou-Saleh MT. 2011."Prevalence of mental disorders in the adult population attending primary health care setting in Qatari population". *J Pak Med Assoc*.61 (3):6.

17. Ghuloum, Suhaila & Bener, Abdulbari & Dafeeah, Elnour & Al-Yazidi, Tariq & Mustapha, Ahmed & Zakareia, Ahmed. 2014. Lifetime Prevalence of common mental disorders in Qatar: Using WHO Composite International Diagnostic Interview (WHO-CIDI). *International Journal of Clinical Psychiatry and Mental Health* 2. 10.12970/2310-8231.2014.02.01.4.

18. Grant BF, Hasin DS, Stinson FS, Dawson DA, June Ruan W, Goldstein RB, Smith SM, Saha TD, Huang B. 2005. Prevalence, correlates, co-morbidity, and comparative disability of DSM-IV generalized anxiety disorder in the USA: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Psychol Med. 35(12):1747-59. doi: 10.1017/S0033291705006069. Epub 2005 Oct 5. PMID: 16202187.

19. Hofmann, S. G., Anu Asnaani, M. A., & Hinton, D. E. (2010). Cultural aspects in social anxiety and social anxiety disorder. Depression and anxiety, 27(12), 1117–1127. https://doi.org/10.1002/da.20759

20. Kelly J. 2008. "Computer-Assisted Telephone Interviewing (CATI)". In: *Encyclopedia of Survey Research Methods [Internet]*. Lavrakas, P. J. (editor). Thousand Oaks, CA: SAGE Publications Ltd; p. 123. (Survey Research). Available from: http://dx.doi.org/10.4135/9781412963947.n83

21. Casady RJ, Lepkowski LM. 1993."Stratified telephone survey designs". *Surv Methodol [Internet]* 19(1):133–112. Available from: http://ccsg.isr.umich.edu/references/Casady-R-J-and-Lepkowski-J-M-1993-Stratified-telephone-survey-designs-Survey-Methodology-191-103-113.html

21. Cornfield J. 1951.”The Determination of Sample Size”. *Am J Public Health Nations Health* 41(6):654–61.

22. Kish L. 1965.” Survey Sampling”. New York: John Wiley & Sons.

23. EuroQol Group. EuroQol.1990. “a new facility for the measurement of health-related quality of life”. *Health Policy Amst Neth*. 16(3):199–208.

24. Spitzer RL, Kroenke K, Williams JBW, Lowe B. 2006.”A brief measure for assessing generalized Anxiety disorder: the GAD-7”. *Arch Intern Med*.166 (10):1092–7.

25. Kroenke K, Spitzer RL, Williams JBW, Lowe B. 2010.”The Patient Health Questionnaire Somatic, Anxiety, and Depressive Symptom Scales: a systematic review”. *Gen Hosp Psychiatry* 32(4):345–59. Available from https://www.phqscreeners.com/

26. Kroenke K, Spitzer RL, Williams JW, Monahan PO, Löwe B. 2007.”Anxiety disorders in primary care: Prevalence, impairment, comorbidity, and detection”. *Ann Intern Med [Internet]* 6; 146(5):317–25. Available from: http://dx.doi.org/10.7326/0003-4819-146-5-200703060-00004

27. Kertz S, Bigda-Peyton J, Bjorgvinsson T. 2013. “Validity of the Generalized Anxiety Disorder-7 scale in an acute psychiatric sample”. *Clin Psychol Psychother*. 20(5):456–64.

28. Lauren G. Staples, Blake F. Dear, Milena Gandy, Vincent Fogliati, Rhiannon Fogliati, Eyal Karin, Olav Nielssen, Nickolai Titov.2019.Psychometric properties and clinical utility of brief measures of depression, anxiety, and general distress: The PHQ-2, GAD-2, and K-6, *General Hospital Psychiatry* 56:13-18. https://doi.org/10.1016/j.genhosppsych.2018.11.003.

29. Lowe B, Decker O, Muller S, Brahler E, Schellberg D, Herzog W, et al. 2008.”Validation and Standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population”. *Med Care* 46(3):266–74.

30. Lowe B, Kroenke K, Grafe K. 2005.” Detecting and monitoring depression with a two-item questionnaire (PHQ-2)”. *J Psychosom Res*. 58(2):163–71.

31. Gardner A, Pessoa S, Diop A, Al-Ghanim K, Le Trung K, Harkness L. 2013.”A Portrait of Low-Income Migrants in Contemporary Qatar”. *J Arab Stud [Internet]* 3(1):1–17. Available from: http://dx.doi.org/10.1080/21534764.2013.806076

32. Spitzer RL, Kroenke K, Williams JB. 1999.”Validation and utility of a self-report version of PRIME- MD: the PHQ primary care study”. Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. *JAMA* 282 (18):1737–44.

33. Hausman J, McFadden D. 1984.” Specification tests for the multinomial logit model”. *Econom J Econom Soc*. 1219–40.

34. Acquadro C, Conway K, Giroudet C, Mear I. 2012.” Linguistic Validation Manual for Health Outcome Assessments”. Mapi Institute.

35. Long J, Freese J. 2014.” Regression models for categorical dependent variables using Stata”. Third Edition. College Station, TX, USA: Stata Press; 242–254 p.

36. Plummer F, Manea L, Trepel D, McMillan D. 2016.”Screening for anxiety disorders with the GAD-7 and GAD-2: a systematic review and diagnostic metanalysis”. *Gen Hosp Psychiatry.* 39:24–31.

37. Christensen H, Batterham PJ, Grant JB, Griffiths KM, Mackinnon AJ. 2011.” A population study comparing screening performance of prototypes

for depression and anxiety with standard scales". *BMC Med Res Methodol*.11:154.

38. Donker T, van Straten A, Marks I, Cuijpers P. 2011."Quick and easy self-rating of Generalized Anxiety Disorder": validity of the Dutch web-based GAD-7, GAD-2 and GAD-SI. *Psychiatry Res.* 188(1):58–64.

39.Sawaya H, Atoui M, Hamadeh A, Zeinoun P, Nahas Z. 2016."Adaptation and initial validation of the Patient Health Questionnaire – 9 (PHQ-9) and the Generalized Anxiety Disorder – 7 Questionnaire (GAD-7) in an Arabic speaking Lebanese psychiatric outpatient sample". *Psychiatry Res [Internet]* 239:245–52. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0165178116304504

40.Lamers F, van Oppen P, Comijs HC, Smit JH, Spinhoven P, van Balkom AJLM, et al. 2011."Comorbidity patterns of anxiety and depressive disorders in a large cohort study": the Netherlands Study of Depression and Anxiety (NESDA). *J Clin Psychiatry* 72(3):341–8.

41. Leray E, Camara A, Drapier D, Riou F, Bougeant N, Pelissolo A, et al. 2011. Prevalence, characteristics and comorbidities of anxiety disorders in France: results from the "Mental Health in General Population" survey (MHGP). *Eur Psychiatry J Assoc Eur Psychiatr*. 26(6):339–45.

42. Watterson RA, Williams JVA, Lavorato DH, Patten SB. 2017." Descriptive Epidemiology of Generalized Anxiety Disorder in Canada*". Can J Psychiatry Rev Can Psychiatr*. 62(1):24–9.

43. McEvoy PM, Grove R, Slade T. 2011."Epidemiology of anxiety disorders in the Australian general Population": findings of the 2007 Australian National Survey of Mental Health and Wellbeing. *Aust N Z J Psychiatry*. 45 (11):957–67.

44. Kampman O, Viikki M, Järventausta K, Leinonen E. 2014.” Meta-Analysis of Anxiety Disorders and Temperament”. *Neuropsychobiology [Internet]* 69(3):175–86. Available from: https://www.karger.com/DOI/10.1159/000360738

45. Taylor S, Abramowitz J, McKay D, Asmundson GJG. 2009.” Anxious traits and temperaments. In Textbook of Anxiety Disorders”. Second. Washington DC: *American Psychiatric Publishing Inc*. 73–86.

46. Dragan WL, Oniszczenko W. 2009.”The association between dopamine D4 receptor Exon II polymorphism and intensity of PTSD symptoms among flood survivors. *Anxiety Stress Coping Int J*.22 (5):483–95.

47. Oniszczenko W, Dragan WL. 2005. “Association between dopamine D4 receptor exon III polymorphism and emotional reactivity as a temperamental trait. *Twin Res Hum Genet Off J Int Soc Twin Stud*. 8(6):633–7.

48. DC, Doyle AC, Kwan M, Stanger C, Hudziak JJ.2006. “Exploring the boundary between temperament and generalized anxiety disorder”: a receiver operating characteristic analysis. *J Anxiety Disord*. 20(7):931–45.

49. Strelau J, Zawadzki B. 2011.” Fearfulness and anxiety in research on temperament: Temperamental traits are related to anxiety disorders. *Spec Issue Anxiety Dedic Mem Profr Blazej Szymura [Internet]* 1: 50(7):907–15.

Available from: http://www.sciencedirect.com/science/article/pii/S0191886910003466

50. Karam EG, Salamoun MM, Yeretzian JS, Mneimneh ZN, Karam AN, Fayyad J, et al. 2010.” The role of anxious and hyperthymic temperaments in mental disorders”: a national epidemiologic study. *World Psychiatry Off J World Psychiatr Assoc WPA*. 9(2):103–10.

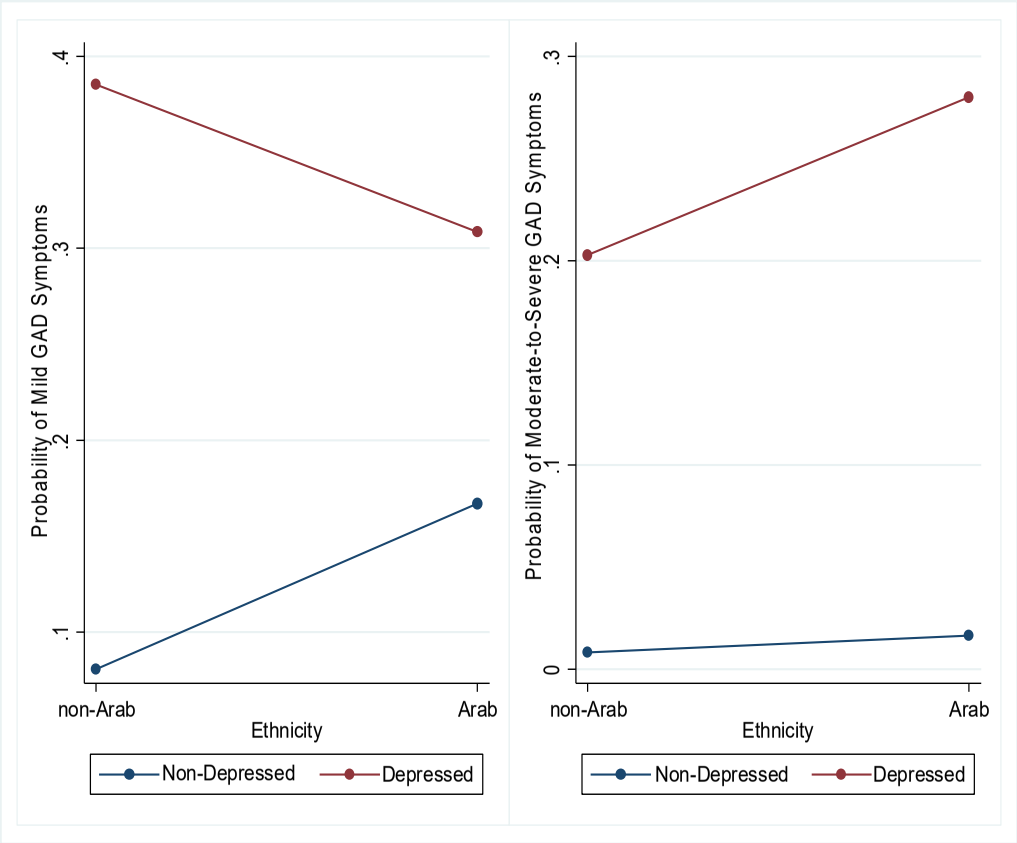
Probability of Mild GAD Symptoms
.1
.2
.3
.4
non-Arab
Arab
Ethnicity
Non-Depressed
Depressed
Probability of Moderate-to-Severe GAD Symptoms
0
.1
.2
.3
non-Arab
Arab
Ethnicity
Non-Depressed
Depressed

Table 1: Sample Characteristics

Variables	Variable Levels	n/N	%	95% CI
Gender	Male	(1,936/2,640)	82.3	80.6 – 83.8
	Female	(704/2,640)	17.7	16.2 – 19.4
Age (years)	18 – 24	(327/2,639)	10.6	9.2 – 12.0
	25 – 34	(971/2,639)	40.0	37.7 – 42.4
	35 – 44	(724/2,639)	30.0	27.8 – 32.3
	45+	(617/2,639)	19.4	17.6 – 21.2
Current Marital Status	Unmarried (never married, widowed, divorced)	(822/2,636)	29.1	27.0 – 31.3
	Married	(1,814/2,636)	70.9	68.7 – 73.0
Migrant Status	Non-Migrant	(751/2,650)	7.9	7.3 – 8.6
	Migrant	(1,899/2,650)	92.1	91.4 – 92.7
Type of Migrant	Lower-Income Expatriate	(1,073/1,899)	70.7	68.6 – 72.7
	Higher-Income Expatriate	(826/1,899)	29.3	27.3 – 31.4
Ethnicity	Arab	(1,352/2,638)	25.7	24.1 – 27.5
	South Asian	(1,083/2,638)	64.2	62.1 – 66.3
	East Asian	(120/2,638)	6.6	5.4 – 7.9
	Other	(83/2,638)	3.5	2.7 – 4.4
Education	Level 1 (None)	(91/2,635)	4.2	3.3 – 5.4
	Level 2 (Grades 1 thru 12)	(606/2,635)	29.0	26.7 – 31.3
	Level 3 (Diploma)	(831/2,635)	32.7	30.5 – 35.0
	Level 4 (Post-Secondary)	(1,107/2,635)	34.1	31.9 – 36.2
Employment Status	Unemployed	(494/2,642)	11.1	9.9 – 12.4
	Employed	(2,148/2,642)	88.9	87.6 – 90.1
Household IncomeCategories	First Quartile	(571/2,466)	20.0	18.2 – 21.9
	Second Quartile	(591/2,466)	24.5	22.4 – 26.7
	Third Quartile	(522/2,466)	21.3	19.4 – 23.4
	Fourth Quartile	(782/2,466)	34.2	31.9 – 36.6
Ever Diagnosed with a Serious Health Condition	Yes	(626/2,641)	20.8	19.0 – 22.8
	No	(2,015/2,641)	79.2	77.2 – 81.1
Health Rating Quartiles	First Quartile (Poor)	(155/2,570)	7.2	6.0 – 8.6
	Second Quartile (Fair)	(334/2,570)	12.7	11.2 – 14.4
	Third Quartile (Good)	(741/2,570)	27.9	25.8 – 30.1
	Fourth Quartile (Excellent)	(1,340/2,570)	52.2	49.7 – 54.6

Note. All percentages are based on weighted proportions and therefore differ from the raw percentages

Table 2: Bivariate Socio–demographics, Work–related and Health–related Associations of Mild and Moderate-to-Severe Symptoms ofGeneralized Anxiety Disorder (GAD)

		Mild[γ] (Score 5 - 9)			Moderate-to-Severe[γ] (Score 10 - 21)		
		Odds Ratio	**95% CI**	**p value**	**Odds Ratio**	**95% CI**	**p value**
Gender (Male ref.)	Female	1.70	1.47 – 1.96	0.000	1.87	1.44 – 2.41	0.000
Age in Years (18 –24 ref.)	25 – 34	0.67	0.44 – 1.03	0.070	1.02	0.45 – 2.36	0.953
	35 – 44	0.71	0.45 – 1.11	0.132	0.98	0.41 – 2.33	0.963
	45+	0.78	0.49 – 1.23	0.283	0.77	0.31 – 1.91	0.569
Current Marital Status (Married ref.)	Unmarried (never married, widowed, divorced)	0.81	0.61 – 1.08	0.156	0.61	0.36 – 1.03	0.065
Migrant Status (Non-migrant ref.)	Migrant	0.52	0.41 – 0.67	0.000	0.40	0.27 – 0.61	0.000
Type of Migrant (Non-migrant ref.)	Higher-Income Migrant	0.76	0.58 – 1.00	0.054	0.43	0.26 – 0.73	0.002
	Lower-Income Migrant	0.43	0.33 – 0.57	0.000	0.39	0.24 – 0.63	0.000
Ethnicity (Non-Arab ref.)	Arab	2.28	1.76 – 2.94	0.000	2.07	1.29 – 3.32	0.003
Education (None ref.)	Level 2 (Grades 1 thru 12)	1.69	0.61 – 4.64	0.312	1.29	0.22 – 7.57	0.779
	Level 3 (Diploma)	2.72	1.01 – 7.33	0.048	1.60	0.28 – 9.24	0-599
	Level 4 (Post-Secondary)	2.96	1.10 – 7.91	0.031	1.74	0.30 – 10.0	0.533
Employment (Employed ref.)	Unemployed	0.48	0.35 – 0.66	0.000	0.47	0.27 – 0.82	0.008
Depression (Continuous Score)	1-unit	2.15	1.91 – 2.41	0.000	3.36	2.79 – 4.04	0.000
Duration of Stay (Continuous Score)	Years	0.98	0.96 – 1.00	0.103	0.94	0.89 -0.99	0.042
Household Income (First Quartile ref.)	Second Quartile	1.03	0.70 – 1.53	0.862	0.56	0.23 – 1.36	0.198
	Third Quartile	0.91	0.61 – 1.37	0.653	1.15	0.56 – 2.36	0.712
	Fourth Quartile	0.85	0.58 – 1.23	0.385	1.09	0.57 – 2.06	0.792
Ever Diagnosed with Serious Health Condition (None ref.)	Yes	1.24	0.91 – 1.68	0.177	1.32	0.75 – 2.31	0.334
Quartiles Health Rating (Excellent ref.)	Poor	2.94	1.77 - 4.88	0.000	5.71	2.86 – 11.40	0.000
	Fair	2.27	1.52 – 3.38	0.000	2.75	1.42 – 5.33	0.003
	Good	1.80	1.30 – 2.49	0.000	0.67	0.31 – 1.43	0.303

Ref. is reference category. OR is odds ratio. CI is 95% Confidence Interval. All estimates are weighted.
[γ] Normal levels of GAD (Score 0 - 4) is the reference category; PHQ-2

Table 3: The Association between symptoms of Generalized Anxiety Disorder and Socio–demographic, Work–related and Health–related Characteristics

		Fully Adjusted Model[§]						Final (Reduced) Adjusted Model[¶]					
Variables		**Mild vs. Normal**			**Moderate-to-Severe vs. Normal**			**Mild vs. Normal**			**Moderate-to-Severe vs. Normal**		
		OR	**95% CI**	**p value**	**OR**	**95% CI**	**p value**	**OR**	**95%CI**	**p value**	**OR**	**95%CI**	**p value**
Gender (Male ref.)	Female	1.37	1.11 – 1.68	0.003	1.65	1.06 – 2.56	0.026	1.37	1.15 – 1.64	0.001	1.64	1.08 – 2.47	0.019
Age (Continuous)	Years	1.00	0.99 – 1.02	0.597	1.01	0.98 – 1.04	0.605	1.00	0.99 – 1.02	0.675	1.01	0.99 – 1.04	0.339
Current Marital Status (Married ref.)	Unmarried (never married, widowed, divorced)	0.90	0.61 – 1.34	0.608	1.01	0.47– 2.13	0.986	---	---	---	---	---	---
Type of Migrant(Non-migrant ref.)	Higher-Income migrant	1.55	0.96 – 2.49	0.070	1.29	0.57 – 2.93	0.544	1.44	0.94 – 2.21	0.093	1.41	0.69 – 2.88	0.350
	Lower-Income migrant	1.01	0.54 – 1.88	0.982	1.14	0.37 – 3.56	0.815	1.12	0.63 – 2.00	0.688	1.68	0.58 – 4.88	0.337
Ethnicity (Non-Arab ref.)	Arab	1.77	1.11 – 2.81	0.016	2.09	0.86 – 5.08	0.103	1.78	1.15 – 2.76	0.009	2.36	1.02 – 5.44	0.044
Current Employment Status (Employed ref.)	Unemployed	0.96	0.59 – 1.56	0.868	1.06	0.49 – 2.28	0.883	---	---	---	---	---	---
Education (No Diploma ref.)	Diploma	0.81	0.54 – 1.23	0.330	1.03	0.49 – 2.20	0.927	---	---	---	---	---	---
Net Household Income (First Quartile ref.)	Quartile 2	1.45	0.93 – 2.27	0.102	1.10	0.40 – 3.04	0.854	---	---	---	---	---	---
	Quartile 3	1.10	0.67 – 1.80	0.694	1.56	0.63 – 3.86	0.332	---	---	---	---	---	---
	Quartile 4	1.23	0.77 – 1.96	0.387	1.83	0.78 – 4.29	0.164	---	---	---	---	---	---
Depressive Symptoms (Continuous)	1-unit	2.08	1.84 – 2.36	0.000	3.25	2.68 – 3.94	0.000	2.10	1.85 – 2.38	0.000	3.35	2.75 – 4.07	0.000
Duration of Stay in Qatar (Continuous)	Years	0.96	0.94 –0.99	0.009	0.92	0.88 – 0.97	0.003	0.96	0.94 – 0.99	0.005	0.91	0.87 – 0.96	0.001
Quartiles Health Rating (Excellent ref.)	PoorFair	2.25	1.24 – 4.08	0.008	3.91	1.49 – 10.21	0.005	2.12	1.18 – 3.82	0.012	3.50	1.37 – 8.92	0.009
	Good	1.86	1.11 – 3.11	0.019	2.20	0.95 – 5.08	0.065	1.86	1.13 – 3.07	0.015	2.18	0.96 – 4.90	0.061
		1.45	0.98 – 2.13	0.061	0.38	0.15 – 0.95	0.039	1.43	0.98 – 2.08	0.062	0.49	0.20 – 1.21	0.122

Ref. is reference category. CI is 95% confidence intervals. All estimates were weighted. The following GAD-7 cut-offs were used to define Normal (total score between 0 and 4), Mild (total score between 5 and 9), or Moderate-to-Severe levels of GAD (total score between 10 and 21). PHQ-2

[§]Model was based on adjustment for all variables and n=2,071. [¶]Model adjusted was based on n=2,202 and adjustment for all variables with exception of employment status, education and income.

Table 4. Frequency (%) and Association between Ethnicity & Participants Endorsing Each Anxiety Symptom based on Age and Gender Adjusted Models

	Mild Levels or "Several Days"					Moderate-to-Severe Levels or "Half the Days or Every Day"				
Variables	**Non-Arab (N=1,249) %(n)**	**Arab (N =1,313) %(n)**	**Total (N=2,562) %(n)**	**Odds Ratio [γ] (95% CI)**	**P-value**	**Non-Arab (N=1,249) %(n)**	**Arab (N =1,313) %(n)**	**Total (N=2,562) %(n)**	**Odds Ratio [γ] (95% CI)**	**P-value**
Feeling Nervous, Anxious or on Edge	19.7 (239)	44.0 (585)	26.0 (824)	3.40 (2.69, 4.29)	**0.000**	4.7 (58)	11.6 (165)	6.5 (223)	3.18 (2.12, 4.76)	**0.000**
Not Able to Stop or Control Worrying	17.8 (223)	18.4 (216)	17.9 (439)	0.88 (0.68, 1.14)	0.332	5.4 (67)	5.9 (82)	5.5 (149)	0.73 (0.45, 1.20)	0.215
Worrying too Much about Different Things	23.2 (301)	24.3 (304)	23.5 (605)	1.00 (0.78, 1.27)	0.995	7.0 (95)	7.4 (99)	7.1 (194)	0.75 (0.49, 1.14)	0.180
Trouble Relaxing	8.7 (119)	25.8 (341)	13.2 (460)	3.39 (2.52, 4.56)	**0.000**	4.4 (59)	9.0 (119)	5.6 (178)	1.78 (1.14, 2.76)	**0.011**
Being so restless that it's hard to sit still	11.1 (137)	14.4 (185)	11.9 (322)	1.24 (0.93, 1.65)	0.145	2.7 (37)	3.8 (56)	3.0 (93)	0.95 (0.49, 1.85)	0.880
Becoming Easily Annoyed or Irritable	23.2 (300)	32.8 (459)	25.7 (759)	1.57 (1.25, 1.98)	**0.000**	4.5 (59)	11.5 (145)	6.3 (204)	2.28 (1.51, 3.45)	**0.000**
Feeling afraid as if something awful might Happen	14.4 (184)	19.2 (248)	15.7 (432)	1.23 (0.94, 1.61)	0.129	3.4 (42)	4.4 (61)	3.7 (103)	0.87 (0.49, 1.55)	0.641

OR is odds ratio. All estimates are weighted. [γ] Normal levels of GAD is the reference category and includes "not at all" response options for each symptom.