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Common Mental Health Conditions and Self-Stigma in Saudi Adults: Implications for Promotion and Intervention

ABSTRACT

Objective: Saudi Arabian adults face high rates of depression, stress, and anxiety. Self-stigma complicates the situation, hindering timely treatment and resulting in adverse outcomes. This study examined the prevalence of these mental health conditions and self-stigma among adults and their association with sociodemographic factors in the Jazan region of Saudi Arabia. The findings will inform targeted interventions and support for better mental health understanding in the region.

Methods: This cross-sectional study included 1056 participants aged ≥18 years. Convenient sampling was used, and participants completed a self-administered online questionnaire comprising 49 questions. The questionnaire covered demographics, mental illnesses (assessed through the depression, anxiety, and stress scale 21 [DASS-21] questionnaire), and self-stigmatizing attitudes toward the measured mental conditions (measured using the self-stigma of depression scale [SSDS] questionnaire).

Results: The majority of the 1056 participants were Saudi nationals living in the Jazan region, with a mean age of 29 years. The participants' mental health data revealed a high prevalence of depression, anxiety, and stress symptoms (55%, 56%, and 39%, respectively). The DASS-21 questionnaire results revealed varying degrees of depression (normal: 45%, mild: 12%, moderate: 20%, severe: 8%, extremely severe: 15%), anxiety (normal: 44%, mild: 7%, moderate: 18%, severe: 8%, extremely severe: 23%), and stress (normal: 60%, mild: 11%, moderate: 11%, severe: 10%, extremely severe: 7%). The mean self-stigmatization score reported was 52 (Standard Deviation (SD) = 17), with 540 (51%) participants having stigma and 513 (49%) with low levels of stigma. The relationship assessment between stigma and depression, anxiety, and stress revealed that levels of stigma were higher in normal individuals than in those having depression, anxiety, or stress. Regression analysis was performed to investigate the association between mental health variables, self-stigmatization, and other factors. The analysis revealed that urban residence and the severity of depression, anxiety, and stress were associated with lower levels of self-stigmatization.

Conclusion: This research highlighted the high prevalence of depression, anxiety, and stress, along with self-stigmatization in Jazan, Saudi Arabia. Recommendations include increasing awareness, improving access to services, promoting early intervention, enhancing community support, combating self-stigma, and conducting further research to confirm generalizability. Targeted interventions and public health strategies are needed to promote mental well-being and address this burden in Jazan.

Keywords: Adults, anxiety, depression, mental health, prevalence, Saudi Arabia, self-stigma, stress

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Introduction

Mental illness is a pressing global health issue that transcends cultural and societal boundaries. It is defined by the World Health Organization (WHO) as conditions involving disruptions in thinking, mood, behavior, and perception affecting a person's well-being and functioning.

Mental illnesses affect a staggering number of individuals. In 2019, about 970 million people worldwide—equivalent to 1 in every 8 individuals—were grappling with these conditions, representing a 13% increase over the past decade. Significant demographic changes have been a primary driver of this rise in prevalence.[1,2] It is alarming that mental health disorders now afflict 1 in 5 people globally, with approximately 20% of children and adolescents affected.[1] The repercussions are extensive, reaching individuals, families, communities, and societies, as they can lead to disabilities, unemployment, homelessness, and early mortality.

Anxiety, depression, and stress stand out as the most commonly diagnosed mental disorders. Anxiety disorders entail persistent fear, apprehension, and worry, whereas depression is characterized by enduring sadness and a loss of interest or pleasure in once enjoyable activities, often accompanied by disturbances in sleep and appetite. These conditions affect approximately 5% of adults worldwide.[3] Stress, on the other hand, is the mental tension resulting from challenging situations—an adaptive response fostering problem-solving and threat management. The major global prevalence of anxiety, depression, and stress substantially impairs individuals' daily functioning, relationships, and overall well-being. These conditions not only debilitate cognitive faculties and disrupt sleep patterns but also elevate the risk of developing other mental health issues.[4]

Although the global impact of mental illness is profound, it is imperative to understand the national perspective. In Saudi Arabia, studies have revealed that 12.7% and 12.4% of the population exhibit risk factors for major depressive disorder (MDD) and generalized anxiety disorder (GAD), respectively.[4] A study that focused on university students in Saudi Arabia reported considerably higher prevalence rates for first-year students: 80.4% for depression, 71.8% for anxiety, and 69.3% for stress. Self-stigma, the internalization of prejudice and discrimination by those affected, has far-reaching consequences, significantly influencing individuals' attitudes and behaviors toward their mental conditions.[5] There is a logical relationship between common mental conditions like depression, anxiety, and stress (DAS) and self-stigma, as the experience of DAS can deter individuals from seeking timely treatment and exacerbate negative self-perception and self-judgment, reinforcing self-stigma.[5-10] The presence of self-stigma can further perpetuate the negative impact of common mental conditions, leading to reduced self-efficacy, social withdrawal, and reluctance to seek help or disclose one's mental health condition.[5-9]

Given these considerations, this study aims to assess the prevalence of depression, stress, and anxiety, as well as the extent of self-stigma associated with these conditions among individuals aged 18 years and above in the Jazan region of Saudi Arabia, while also exploring the relationship between these variables and various sociodemographic characteristics. The study specifically addresses the lack of representative data on mental health issues and self-stigma in the Jazan region.

This study is unique in Saudi Arabia as it explores the relationship between common mental conditions and self-stigma. Such a study will provide policymakers with a comprehensive understanding of mental well-being and its impact on self-stigma, particularly in a relatively large sample that includes multiple variables. Additionally, the study utilizes objective measurements for assessing mental well-being and stigmatization, enhancing the accuracy and validity of the findings obtained.

MAIN POINTS

- *Fifty-five percent of participants experienced depression, 56% experienced anxiety, and 39% experienced stress.*
- *Moderate-to-severe mental health symptoms were common, with 51% of participants reporting stigma.*
- *Stigma levels were higher in individuals without mental health conditions, suggesting a nuanced relationship between stigma and symptom severity.*
- *Urban residence and the severity of mental health symptoms were associated with lower self-stigmatization levels, indicating potential targets for interventions.*

Methods

Study Design and Samples

This cross-sectional study, conducted between June 2023 and December 2023, included participants from Saudi Arabia aged 18 years and above, primarily from the Jazan region.

The minimum required sample size was 461; the calculation was based on the total population aged 18 years and above in the Jazan region (919 267), a confidence interval of 95%, an error margin not exceeding 5%, a nonresponse rate of 20%, and the following sample size formula,[11] where N = population size (919 267); d = error + 5%; Z = 1.96 (confidence level of 95%); and P = probability of 50%.

$$n = \frac{Nz^2_{(a)}P(1-P)}{(N-1)d^2 + P(1-P)z^2_{(a)}}$$

After substituting these values, 461 participants were obtained. However, we increased the study sample to 1056 in order to decrease the margin of error and to increase the precision of the results.

The sampling method used was a convenience sampling method, and the data collection was carried out using a self-administered online questionnaire composed of 49 questions. The questionnaire was sent to the participants via social media platforms (WhatsApp, Twitter, Telegram, Facebook, and others).

Data Collection Tool

In the first section, we asked about participants' demographics such as age, gender, employment status, education level, monthly income, residency, and geographical area.

In the second section, we adopted the Depression, Anxiety, and Stress Scale 21 (DASS-21) questionnaire, which is a validated questionnaire that assesses certain mental disorders (depression, anxiety, and stress) in study participants.[12,13] We used the Arabic translation of DASS-21, which is a valid and reliable indicator composed of a 21-question self-report, with subscales to measure depression, anxiety, and stress severity. The 3 components of the DASS-21 scale have 7 questions each; each response is scored on a 4-point Likert scale, which ranges from 0 ("did not apply to me at all") to 3 ("applied to me very much, or most of the time"). The results were calculated by summing the answers on each subscale and then multiplying by 2, yielding a score range of 0-42 on each subscale. Scores above 20, 14, and 25 on the depression, anxiety, and stress subscales, respectively,

are an indication of severe levels.[14] The DASS-21 questionnaire shows good convergent and discriminant validity, high internal consistency, and reliability, with Cronbach's alpha reported at 0.94 for depression, 0.87 for anxiety, and 0.91 for stress, and internal consistency of $\alpha = 0.88$ for depression, 0.86 for anxiety, and 0.89 for stress.[15]

In the third section, we used the self-stigma of depression scale (SSDS) questionnaire, which is a validated questionnaire designed to assess the extent to which a person holds stigmatizing attitudes toward themselves in relation to having depression.[16,17] However, after consulting the authors of the scale, they confirmed that the scale can also be used to assess self-stigma for any other mental disorder. The SSDS is a 16-item scale with 4 subscales: shame, self-blame, social inadequacy, and help-seeking inhibition. Responses to the self-stigma items are measured on a 5-point Likert scale (ranging from 1 "strongly agree" to 5 "strongly disagree"). Items are coded so that a higher score indicates lower self-stigma.[16,17]

Statistical Analysis

All data were analyzed using R software (version 4.2.3) (R Core Team; Vienna, Austria). Descriptive statistics, including means, Standard Deviation (SDs), and frequencies, were used to summarize sociodemographic characteristics, mental health symptoms, and self-stigma scores. Severity categorization of depression, anxiety, and stress was based on established DASS-21 cutoffs. Prevalence rates were calculated for mental health issues and self-stigma. Differences in mean self-stigma scores across mental health symptom severity levels were analyzed using one-way analysis of variance (ANOVA). Associations between mental health scores, sociodemographics, and self-stigma were assessed using multiple linear regression analysis. The self-stigma score was the dependent variable. Independent variables included age, gender, nationality, residence, body mass index (BMI), smoking status, and mental health scores. Multicollinearity of predictors was assessed using variance inflation factors. All statistical tests were 2-tailed with a significance level α set at 0.05. Confidence intervals (95%) were reported where applicable. The STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) guidelines for reporting observational studies were followed.

Ethical approval

The Standing Committee for Scientific Research at Jazan University gave its approval for this study (reference number REC-45/05/871, dated 04/12/2023). The ethical standards of the institutional and national research committee, the 1964 Helsinki Declaration and its subsequent amendments, or equivalent ethical standards, were followed in all procedures involving human participants in our study. Informed consent was obtained from each participant individually after thoroughly explaining the research project, its objectives, outcomes, and possible benefits.

Results

Sociodemographic, Habitual, and Anthropometric Characteristics

Table 1 presents the sociodemographic characteristics of the sample, consisting of 1056 participants. The mean age of the participants was 29 years (SD = 11). The mean family size was 6.9 children per household (SD = 3.4). For sex distribution, the sample was 58% male and 42% female. The majority of participants were Saudi nationals (98%), predominantly residing in the Jazan region (98%). Regarding residence, 62% of participants lived in rural areas, while 38% resided in urban settings. Social status results indicated that 61% of participants were single, 36% were married, and 3% were divorced or widowed. The income distribution data revealed that 26% of participants earned less than 5000 SAR, 20% earned between 5000 SAR and 9999 SAR, 22% earned between 10 000 SAR and 14 999 SAR, and 33% earned 15 000 SAR or more.

Table 1. Sociodemographic Characteristics of the Sample (n = 1056)

Characteristics	**Mean (SD)**
Age	29 (11) years
Family member	6.9 (3.4) kids/household
Characteristics	Frequency (%)
Gender	
Male	612 (58)
Female	441 (42)
Nationality	
Saudi	1031 (98)
Non-Saudi	22 (2)
Region	
Jazan	1036 (98)
Other cities	17 (2)
Residence	
Rural	658 (62)
Urban	395 (38)
Social status	
Single	641 (61)
Married	384 (36)
Divorced/widowed	28 (3)
Income	
"Less than 5000 SAR"	272 (26)
"5000-9999 SAR"	207 (20)
"10 000-14 999 SAR"	231 (22)
"≥15 000 SAR"	343 (33)

n, sample size, 1 SAR ≈ $0.27. SD, Standard Deviation.

Table 2 shows the habitual and anthropometric characteristics of the sample, consisting of 1056 participants. The mean weight of the participants was 67 kg (SD = 19). The mean height was 164 cm (SD = 9.3), resulting in a mean BMI of 25 kg/m^2 (SD = 5.9). Regarding smoking status, 16.8% of participants reported being smokers, and the

Table 2. Habitual and Anthropometric Characteristics (n = 1056)

Characteristics	**Mean (SD)**
Weight	67 (19) kg
Height	164 (9.3) cm
BMI	25 (5.9) kg/m^2
Characteristics	**Frequency (%)**
Smoking status	
Yes	177 (16.8)
No	876 (83.2)
Smoking types (n = 177)	
Cigarettes	65 (6)
Shisha	66 (6)
Vape	43 (4)

BMI, body mass index; n, sample size.

majority, 83.2%, were non-smokers. Among the smokers (n = 177), the distribution of smoking types for the 16.8% who smoked was 6% for cigarettes, 6% for shisha, and 4% for vape.

Depression, Anxiety, and Stress (DAS), DAS Severity (DASS-21 Scale)

The DASS-21 questionnaire results showed the distribution of individuals across different severity levels in terms of Depression, Anxiety, and Stress (DAS) (Figure 1).[12-15,18] The severity categorization was based on predefined cutoff points.[18] Regarding depression, the majority fell within the "Normal" category, with 45% of respondents reflecting a healthy mental state. A significant portion experienced varying degrees of depression, including 12% classified as "mild," 20% as "moderate," 8% as "severe," and 15% as "extremely severe." Similarly, the Anxiety dimension revealed that 44% of participants were within the "normal" range. However, a substantial portion experienced elevated anxiety levels, with 7% categorized as "mild," 18% as "moderate," 8% as "severe," and 23% as "extremely severe." Regarding stress, the majority (60%) fell within the "normal" range. The remaining 40% experienced varying levels of stress, including 11% classified as "mild," 11% as "moderate," 10% as "severe," and 7% as "extremely severe."

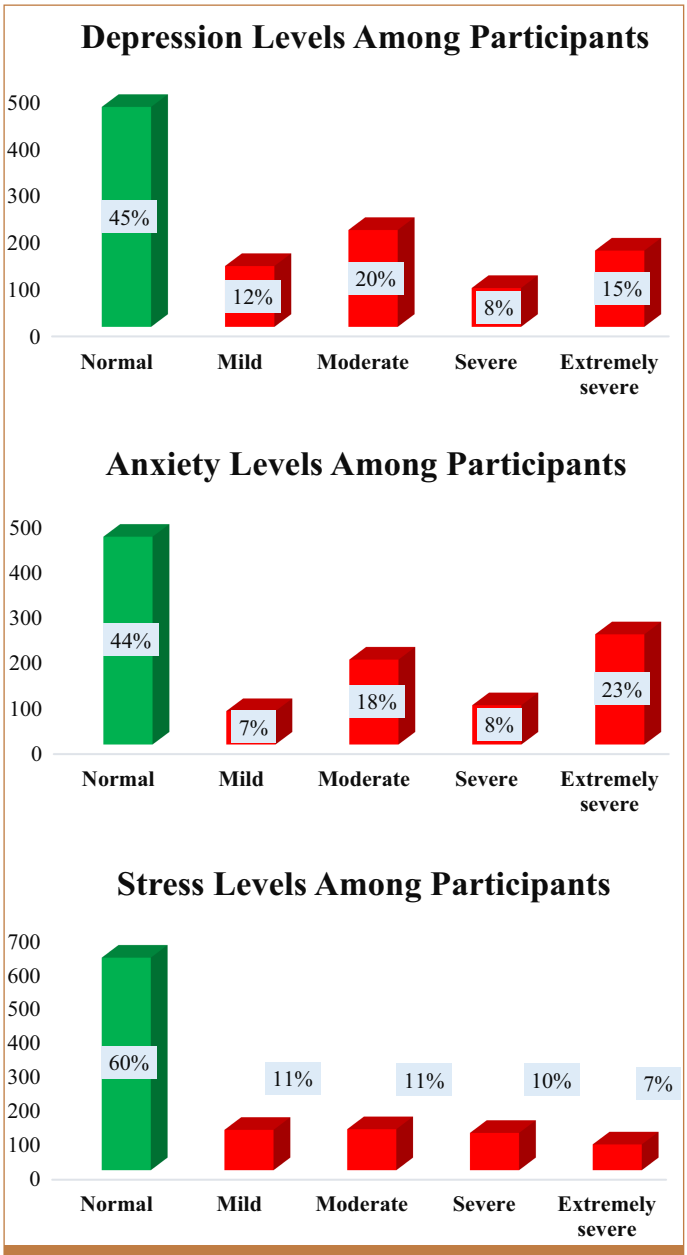

Figure 1. Depression, anxiety, and stress among study participants.

Self-stigmatization (Outcome Variable)

The self-stigmatization findings, as outlined in Table 3 and derived from the SSDS questionnaire[16,17] administered to all 1056 participants, illuminate various dimensions of internalized stigma in which the higher the score, the less stigma is linked to participants' conditions or identities. Participants' responses are described using mean scores and frequencies across distinct self-stigmatization variables. The mean shame score was 14 (SD = 4.8), denoting the average level of shame associated with their condition or identity. The self-blame score, with a mean of 11 (SD = 5.4), reflects the extent to which participants attributed their condition to themselves. Social inadequacy was represented by a mean score of 14 (SD = 5), indicating perceived inadequacy in social situations. Help-seeking inhibition, with a mean score of 13 (SD = 5.6), portrays the degree to which participants felt inhibited in seeking assistance. The comprehensive measure, the stigma score, was calculated at 52 (SD = 17), providing insight into the overall measure of self-stigmatization. Categorizing participants based on the median value, 51% reported having stigma and 49% indicated a lower level of self-stigmatization.

Self-stigma and DAS

The assessment of the relationship between stigma scores (dependent variable) and depression, anxiety, and stress levels (independent variables) revealed significant differences. For depression levels, participants with mild, moderate, severe, and extremely severe depression consistently reported lower stigma scores than those with Normal depression (all $P < .05$). A similar trend was observed for anxiety levels; participants with mild, moderate, severe, and extremely severe anxiety exhibited lower stigma scores than those with normal anxiety (all $P < .05$). In the case of stress levels, participants with mild, moderate, severe, and extremely severe stress reported significantly lower stigma scores than those with normal stress (all $P < .05$). These findings underscore a robust inverse relationship between mental health levels and self-reported stigma (Figure 2).

Association Between DAS Variables and Self-stigmatization

In continuation of our investigation into the relationship between mental health variables and self-stigmatization, we conducted a

Table 3. Self-stigmatization Variables* (n = 1056)

Characteristics	Mean (SD)
Shame score	14 (4.8)
Self-blame score	11 (5.4)
Social inadequacy score	14 (5)
Help-seeking inhibition	13 (5.6)
Overall stigma score	52 (17)
Characteristics	Frequency (%)
Self-stigmatization Categories**	
Has stigma	540 (51)
No stigma	513 (49)

n, sample size. *Based on SSDS questionnaire (16,17). **Categorized based on mean value (51).

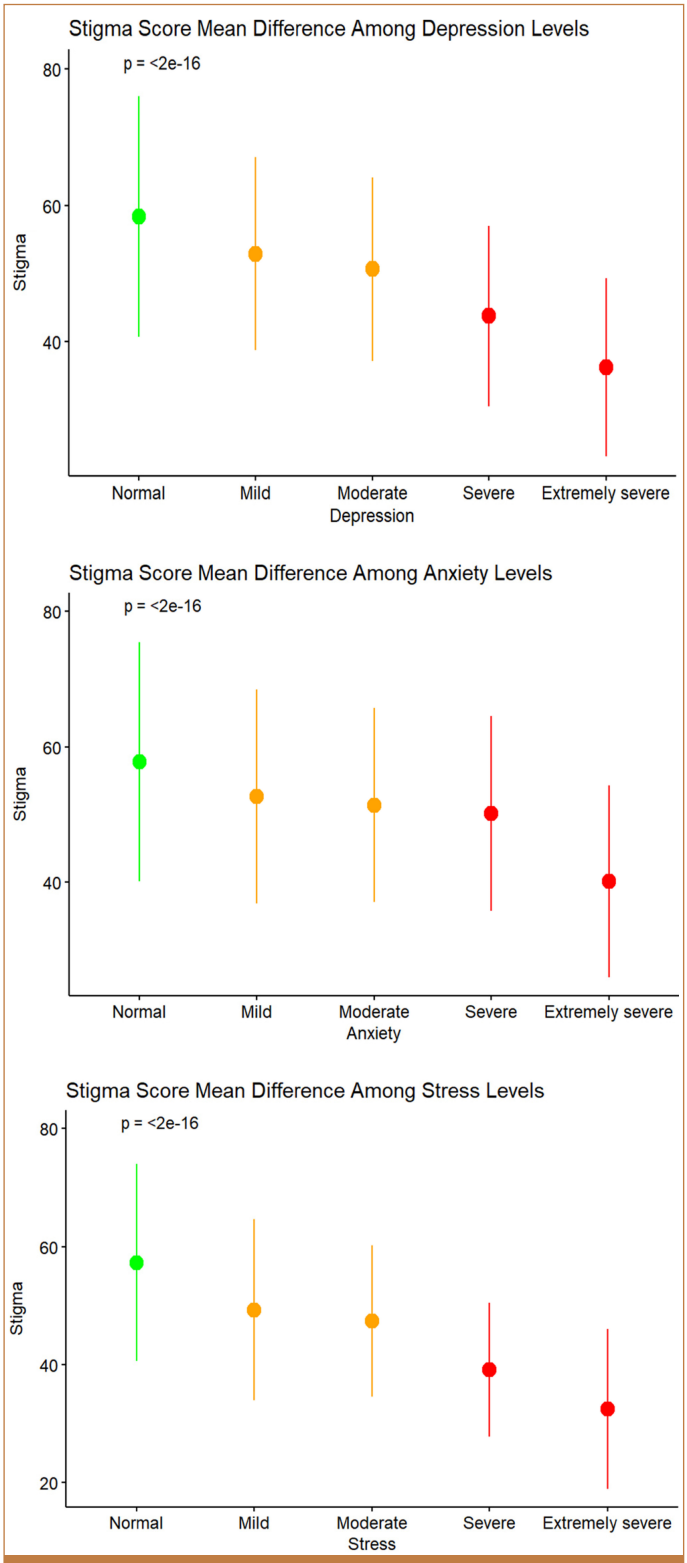

Figure 2. Stigma score difference among depression, anxiety, and stress levels.

multiple linear regression analysis to delve deeper into the impact of various factors on individuals' self-stigma scores. The regression model incorporated predictors such as age, gender, nationality, residence, BMI, smoking status, and the severity of depression, anxiety, and stress. Notably, we observed that urban residence ($\beta = -2.93$, $P = .004$) and the severity of depression, anxiety, and stress were significantly associated with lower self-stigma scores (Depression: mild $\beta = -3.28$, $P = .044$; moderate $\beta = -3.76$, $P = .018$; severe $\beta = -7.26$, $P = .002$; extremely severe $\beta = -10.24$, $P < .001$; Anxiety: extremely severe $\beta = -3.89$, $P = .045$; Stress: mild $\beta = -4.26$, $P = .011$; moderate $\beta = -3.86$, $P = .044$; severe $\beta = -8.87$, $P < .001$; extremely severe $\beta = -13.60$, $P < .001$). In particular, individuals with more severe levels of depression, anxiety, and stress exhibited notably lower self-stigma scores than those with normal levels (Table 4).

Table 4. Multiple Linear Regression of DAS Variables and Self-stigma Score

Predictors	β	Confidence Interval (CI)	P
Age	0.01	−0.12-0.14	.913
Gender (male)	0.13	−1.90-2.16	.902
Nationality (Saudi)	−1.11	−7.82-5.60	.746
Residence (urban)	−2.93	−4.92-−0.95	.004
BMI	−0.14	−0.31-0.03	.101
Smoking (yes)	2.07	−1.90-6.04	.307
Depression			
Mild	−3.28	−6.48-−0.08	.044
Moderate	−3.76	−6.86-−0.65	.018
Severe	−7.26	−11.86-−2.65	.002
Extremely severe	−10.24	−14.92-−5.56	<.001
Anxiety			
Mild	−2.41	−6.30-1.49	.225
Moderate	−1.98	−4.90-0.94	.183
Severe	−1.34	−5.35-2.67	.512
Extremely severe	−3.89	−7.69-−0.09	.045
Stress			
Mild	−4.26	−7.56-−0.96	.011
Moderate	−3.86	−7.62-−0.11	.044
Severe	−8.87	−13.53-−4.21	<.001
Extremely severe	−13.60	−19.39-−7.80	<.001

CI, confidence interval.

Discussion

Summary of the Results

This study of 1056 participants in Jazan, Saudi Arabia, found high rates of mental health issues, with 55% experiencing some degree of depression (n = 579), 56% experiencing anxiety (n = 590), and 40% experiencing stress (n = 421). Regression analysis revealed associations between mental health severity and lower self-stigma. More specifically, the results showed that the participants had a mean age of 29 years, with the majority being Saudi nationals residing in the Jazan region. The sample had slightly more males (58%, n = 611) than females (42%, n = 442), and most participants lived in rural areas (62%, n = 654); 61% (n = 642) of participants were single, 36% (n = 379) were married, and 3% (n = 32) were divorced or widowed. The average family size was 6.9 children per household. Income distribution showed that 26% (n = 274) earned less than 5000 SAR, 20% (n = 211) earned between 5000 and 9999 SAR, 22% (n = 232) earned between 10 000 and 14 999 SAR, and 33% (n = 348) earned 15 000 SAR or more. Regarding smoking status, 16.8% (n = 177) of participants reported being smokers. The study assessed the participants'

mental health using the DASS-21. The results indicated that a significant portion of participants experienced varying degrees of depression, anxiety, and stress. For depression, 45% (n = 474) fell within the "normal" category, while the rest exhibited mild, moderate, severe, or extremely severe depression. Similar patterns were observed for anxiety. Regarding stress, the majority, accounting for 60% (n = 632), fell within the normal range. Additionally, the study examined self-stigmatization using the SDSS questionnaire. Participants reported moderate levels of shame, self-blame, social inadequacy, and help-seeking inhibition. Categorizing participants based on the median value, 51% (n = 537) reported having stigma, while 49% (n = 516) indicated a lower level of self-stigmatization. Regression analysis revealed that urban residence and the severity of depression, anxiety, and stress were associated with lower self-stigma scores.

Importance and Implications of the Findings

The present study provides a comprehensive understanding of the high rates of mental health issues and self-stigma in Jazan, Saudi Arabia. The findings have important implications for the region. First, the high prevalence of depression, anxiety, and stress suggests the urgent need to improve access to mental health services through initiatives like screening programs, awareness campaigns, and targeted treatment options. The levels found suggest that mental health should be a priority issue addressed by healthcare systems in Jazan. Second, the results point to the value of early identification and intervention for individuals at risk of mental health conditions. Social factors like isolation and fear of the unknown appeared to be linked to poorer mental health in this population. Proactive efforts to identify and assist vulnerable groups could help reduce prevalence. Third, the extent of self-stigma reported was concerning, as it deters help-seeking. Targeted anti-stigma campaigns, mental health literacy programs, and community support in Jazan may help combat self-stigma and encourage treatment. The findings also unexpectedly revealed lower self-stigma among those with more severe mental illness. Further research on this trend specific to the Saudi/Jazan context is warranted. Overall, the study makes an important contribution by spotlighting the under-addressed burden of mental health issues in Jazan. The precise estimates of prevalence provide vital data to guide mental health infrastructure development, resource allocation, and tailored interventions in the region. Follow-up studies tracking changes over time are also recommended.

Comparison with Similar Articles

Compared with international prevalence rates, the levels of depression (55%), anxiety (56%), and stress (40%) found in our Saudi sample were notably higher. A global meta-analysis reported substantially lower pooled prevalence estimates of only 30% for depression, 20% for anxiety, and 29% for stress.[19] Our rates aligned more closely with a systematic review during the Coronavirus disease 2019 pandemic, which found prevalences of 33.7, 31.9, and 29.6% for depression, anxiety, and stress, respectively.[7] In terms of self-stigma, our study indicated that 51% of Saudi participants reported experiencing stigma. This level was lower than that reported in research in Western cultures, in which a study on mood disorders found over 50% avoided stigmatizing situations.[6] The lower self-stigma in Saudi Arabia compared with Western samples could potentially reflect cultural differences in family involvement and social support. Further cross-cultural research is warranted.

Our findings did align with past work showing associations between mental health issues and sociodemographic factors like income, education, and gender.[4,20,21] The relevance of these factors to mental health stigma was also confirmed by a Saudi study highlighting greater perceived stigma among males.[22] Overall, our results were largely consistent with previous research within Saudi Arabia and internationally. The higher local prevalence of mental health symptoms reinforces the need for greater attention to this issue in the Jazan region.

Strengths and Limitations

This study has several notable strengths. The large sample size of 1056 participants enhanced the statistical power and precision of the prevalence estimates. The use of validated instruments like the DASS-21 and SSDS provided reliable measurements. The focus on the understudied Jazan region spotlights an important gap in the literature. The holistic approach to assessing both mental health and self-stigma is comprehensive. In addition, the homogeneity of the Saudi population can help generalize the findings of this study on Saudi Arabia as a whole. However, some limitations should be acknowledged. The cross-sectional design prevented determining causality or temporal relationships. The convenient sampling method risked selection bias and reduced generalizability. Self-reported data could involve response biases. Cultural factors in Saudi Arabia may limit comparing results with those in other settings. Online recruitment may miss populations without internet access. Additional limitations include the lack of clinical diagnostic interviews to confirm mental disorders. To build on this research, future studies could use probability sampling, including clinical assessments, examine changes over time, and expand the geographical scope beyond Jazan. Qualitative data on participants' experiences may also provide richer insights. Overall, this work makes an important first step in highlighting the under-addressed burden of mental health issues in the Jazan region of Saudi Arabia.

Conclusion

The present study provided initial evidence of a high prevalence of mental health issues and self-stigma among adults in the Jazan region of Saudi Arabia. Over half of the 1056 participants reported symptoms of depression, anxiety, or stress, and 51% indicated experiencing self-stigma regarding their mental health condition. These high rates underscore the need for greater prioritization of mental health in Jazan through targeted awareness campaigns, improved access to screening and treatment services, anti-stigma programs, and community support systems. However, further research is required to confirm the generalizability of these findings to the broader Jazan population. Additional longitudinal studies tracking changes over time would also be beneficial. Overall, this work helps fill the gap in the literature on the under-addressed but substantial burden of mental health issues in Jazan. The higher prevalence we found indicates the importance of developing tailored interventions and public health strategies to promote mental well-being in this population. This will require cross-sector collaboration and destigmatization efforts to create a more supportive environment surrounding mental health.

Data Availability Statement: The data sets produced and examined during this study can be obtained from the corresponding author, provided the request is reasonable.

Ethics Committee Approval: *This study was approved by the Ethics Committee of Jazan University (Approval No: REC-45/05/871, Date: 4 December 2023).*

Informed Consent: *Informed consent was obtained from all subjects involved in the study.*

Peer-review: *Externally peer-reviewed.*

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