

RESEARCH ARTICLE OPEN ACCESS

Pronounced Gender Differences in Anxiety, Depression, and Stress Among Adults in Kabul, Afghanistan: A Cross-Sectional Study

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Received: 19 April 2026 | **Revised:** 5 May 2026 | **Accepted:** 7 May 2026

Guest Editor: Domenico De Berardis

Keywords: adults | Afghanistan | anxiety | depression | Kabul | stress

ABSTRACT

Introduction: Psychological distress in adults is a major public health concern, particularly in regions affected by conflict, economic hardship, and limited access to mental health services. Individuals in such settings are at increased risk of anxiety, depression, and stress. This study examined gender-based differences in psychological distress among adults in Kabul, Afghanistan. The present study is aimed at investigating gender-based differences in psychological distress among adults residing in Kabul, Afghanistan.

Materials and Methods: A cross-sectional survey was conducted from January to November 2025 using convenience sampling. A total of 968 adults aged ≥ 18 years participated (497 women and 471 men), recruited from community settings across Kabul. Psychological distress was measured using the validated Persian version of the Depression Anxiety Stress Scales-21 (DASS-21). Subscale scores were calculated by summing item scores and multiplying by two, with severity categories applied accordingly. Data were analyzed using IBM SPSS Statistics Version 24. Group differences were assessed using Mann–Whitney U tests, and multiple linear regression analyses identified predictors of anxiety, depression, and stress.

Results: Among participants (51.3% female; 92.0% aged 18–29), women reported higher mean scores than men for anxiety (22.8 ± 6.2 vs. 20.9 ± 6.0), depression (22.1 ± 6.4 vs. 20.8 ± 6.1), and stress (23.0 ± 6.3 vs. 21.2 ± 6.1) (all $p < 0.001$; $r = 0.17 - 0.22$). In adjusted models, female gender predicted higher anxiety ($B = 1.40$), depression ($B = 1.05$), and stress ($B = 1.45$) (all $p \leq 0.003$). Lower income and education were associated with higher distress, whereas younger age was linked only to anxiety ($B = -0.06$, $p = 0.020$). Models explained 15%–17% of variance.

Conclusion: Women reported significantly higher psychological distress across all domains. These differences persisted after adjustment, suggesting underlying structural and psychosocial influences. Lower socioeconomic status was also associated with greater distress, underscoring the importance of social determinants of mental health.

1 | Introduction

Symptoms of anxiety, depression, and stress-related distress represent a major public health concern and are important contributors to disability and reduced quality of life worldwide (1). Recent evidence further underscores the substantial global burden of depressive disorders, highlighting their high prevalence, chronicity, and associated functional impairment across diverse populations (2). These conditions are associated with impaired functioning, diminished productivity, and increased healthcare burden across diverse populations (3). Gender differences in common mental disorders have been consistently reported, with females generally demonstrating higher levels of anxiety and depressive symptoms than males. Such disparities are thought to reflect the interaction of biological vulnerability, gendered social roles, differential exposure to adversity, and unequal access to resources and healthcare (4–7). The burden of mental health disorders is especially pronounced in low- and middle-income countries, where limited mental health services, poverty, unemployment, and social instability often constrain prevention and treatment efforts (8, 9). Afghanistan represents a particularly important context for mental health research, as four decades of war, political upheaval, economic deprivation, forced displacement, and recurrent humanitarian crises have profoundly affected both in-country and refugee Afghan populations, generating persistent psychosocial stressors and elevated mental health burden (10, 11). Recent studies have reported high levels of depressive (72%), anxiety (71.9%), and stress (66.5%) symptoms among Afghan populations, with higher risk observed among females and socioeconomically disadvantaged groups (12). Similarly, research among Afghan healthcare workers has shown substantial levels of depression (52.3%), anxiety (48.8%), and stress (46.9%), highlighting the widespread nature of psychological distress in the country (13). Research among Afghan women has further highlighted reduced quality of life, emotional distress, and the cumulative psychological effects of social restriction, financial insecurity, and limited access to education and healthcare services (14).

Kabul, the capital of Afghanistan, may present a uniquely challenging environment for mental well-being. Rapid urbanization, unemployment, financial strain, housing insecurity, educational disruption, widening social inequality, and uncertainty related to the broader sociopolitical climate may collectively increase psychological distress among residents (15). Importantly, evidence from conflict-affected settings, including Afghanistan, suggests that ongoing daily stressors such as poverty, food insecurity, and unstable living conditions may account for a substantial proportion of mental health burden, sometimes exceeding the impact of direct trauma exposure alone (11, 15). Although previous studies in Afghanistan have documented elevated psychological distress, fewer recent community-based investigations have focused specifically on gender differences in depression, anxiety, and stress symptom burden among adults living in Kabul (11, 15, 16). This gap is important because gender-specific constraints related to education, employment opportunities, mobility, financial autonomy, and healthcare access may intensify vulnerability to poor mental health outcomes, particularly among women. Accordingly, this cross-sectional study is aimed at comparing gender differences in depression, anxiety, and stress symptom burden among adults in Kabul,

Afghanistan, using the Depression Anxiety Stress Scales-21 (DASS-21).

2 | Materials and Methods

This community-based cross-sectional study was conducted in Kabul, Afghanistan, to examine gender differences in depression, anxiety, and stress symptom burden among adults. Data collection took place from January to November 2025, and the study timeline was reviewed and revised to ensure consistency between the reported recruitment period and the ethical approval documentation.

2.1 | Participants and Sampling

Due to logistical, security, and infrastructural constraints in Kabul, including the absence of a comprehensive population-based sampling frame, probability-based sampling was not feasible. Therefore, a nonprobability convenience sampling strategy was adopted to facilitate practical and timely data collection. Participants were recruited between January and November 2025 from six different community-based sites across Kabul, including public markets, parks, and other accessible urban gathering areas. These locations were selected to capture a broad cross-section of the urban adult population. Data collection was conducted at different times of day (morning, afternoon, and early evening) to reduce time-of-day selection bias. Trained research assistants approached eligible individuals in these settings, explained the study purpose, and invited them to participate voluntarily. A total of 1150 individuals were approached, of whom 132 declined participation, yielding 1018 consenting participants (response rate: 88.5%). Of these, 50 questionnaires were excluded because of substantial missing data or inability to complete the survey independently. The final analytical sample comprised 968 participants. Eligibility criteria included (1) age ≥ 18 years, (2) current residence in Kabul, and (3) ability to understand and complete the questionnaire. Exclusion criteria were limited to the following: (1) age < 18 years, (2) nonresidence in Kabul, (3) inability to complete the questionnaire independently, (4) lack of informed consent, and (5) substantial missing data on key variables, or (6) demonstrated self-reported current substance intoxication at the time of assessment that could compromise valid participation. In accordance with STROBE guidelines, participant recruitment and attrition were documented, and a flow diagram summarizing inclusion and exclusion was prepared (Figure 1).

3 | Measures

3.1 | Sociodemographic Variables

Participants reported basic sociodemographic characteristics including age, gender, income level, and educational attainment. Age was analyzed as a continuous variable in regression models and categorized into three groups (18–29, 30–39, and ≥ 40 years) for descriptive analyses, consistent with Table 1. Gender was recorded as male or female. Income level was self-reported and categorized as low, middle, high, or prefer not to say. Educational attainment was classified into five categories: no

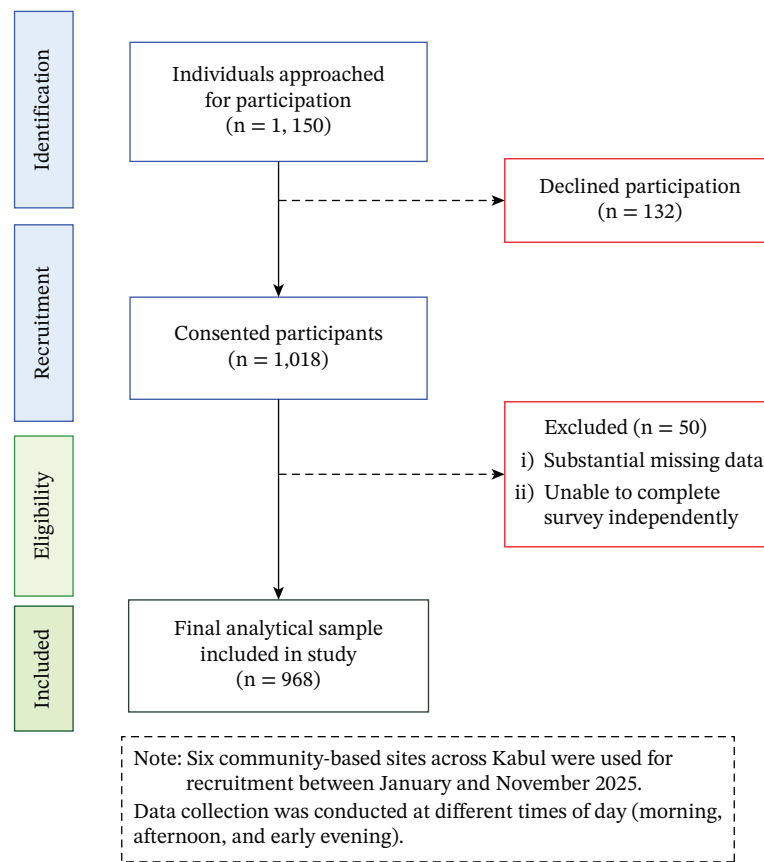


FIGURE 1 | Participant flow diagram.

formal education, primary education, secondary education, university degree, and postgraduate education.

3.2 | Assessment of Psychological Distress

Psychological distress was assessed using the DASS-21, originally developed by Lovibond and Lovibond (17). The DASS-21 comprises three subscales—depression, anxiety, and stress—each consisting of seven items. Participants rated the extent to which each statement applied to them over the past week using a 4-point Likert scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much or most of the time*). A validated Persian-language version of the DASS-21 was used in this study (18), which has previously demonstrated acceptable reliability and validity in Persian-speaking populations. Prior to the main data collection, the adapted questionnaire was pilot tested on a small subset of the target population to assess clarity, comprehensibility, and cultural relevance; no major modifications were required following pilot testing.

For scoring, responses to the seven items within each subscale were summed to obtain raw subscale scores (range: 0–21). DASS-21 subscale scores were calculated by summing item scores and multiplying by two, consistent with standard practice, resulting in a possible range of 0–42 for each subscale. Higher scores indicated greater levels of psychological distress. Severity categories (normal, mild, moderate, severe, and extremely severe) were assigned based on these standardized scores using the cut-off values proposed by Lovibond and

Lovibond. Specifically, depression scores were classified as normal (0–9), mild (10–13), moderate (14–20), severe (21–27), and extremely severe (≥ 28); anxiety scores as normal (0–7), mild (8, 9), moderate (10–14), severe (15–19), and extremely severe (≥ 20); and stress scores as normal (0–14), mild (15–18), moderate (19–25), severe (26–33), and extremely severe (≥ 34).

3.3 | Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics Version 24. Descriptive statistics were summarized as means and standard deviations (SDs) for continuous variables and as frequencies with percentages for categorical variables. Given the nonnormal distribution of DASS-21 subscale scores, medians and interquartile ranges (IQRs) were additionally reported to complement mean-based summaries. Internal consistency reliability of the DASS-21 subscales (depression, anxiety, and stress) was evaluated using Cronbach's alpha coefficients, with corresponding 95% confidence intervals (CIs) to provide precision estimates. The normality of score distributions was assessed using the Shapiro–Wilk test. As all subscales demonstrated significant deviations from normality ($p < 0.001$), nonparametric methods were employed for group comparisons. Recognizing the sensitivity of the Shapiro–Wilk test in large samples, decisions regarding statistical methods were informed by both formal testing and distributional characteristics. Gender differences in psychological distress scores were examined using the Mann–Whitney U test. Effect sizes were expressed as rank-biserial correlation coefficients (r) and 95% CIs. To investigate associations between sociodemographic variables and

psychological distress, linear regression analyses were conducted separately for each outcome (anxiety, depression, and stress). Both unadjusted (bivariate) and adjusted (multivariable) models were estimated. In unadjusted analyses, each predictor was entered individually, whereas in adjusted models, all predictors were entered simultaneously. Age was treated as a continuous variable, and gender was coded as 0= male and 1 =female. Income was modeled as an ordinal variable (low, middle, high), with responses of “prefer not to say” treated as missing and excluded from regression analyses. Educational attainment was also modeled as an ordinal variable (1 = no formal education to 5= postgraduate education).

Given the relatively large sample size, linear regression models were considered robust to moderate deviations from normality. Model assumptions, including linearity, homoscedasticity, independence of residuals, and absence of multicollinearity, were assessed prior to analysis. Independence of residuals was evaluated using the Durbin–Watson statistic, and multicollinearity was assessed using variance inflation factors (VIFs), with values below 5 indicating acceptable levels. Because the three DASS-21 subscales are conceptually and empirically correlated, no formal adjustment for multiple comparisons was applied; instead, interpretation focused on effect sizes, CIs, and the consistency of findings across outcomes. Statistical significance was set at a two-tailed p – value < 0.05.

3.4 | Ethical Considerations

This study was conducted in accordance with the ethical standards of the Khatam Al-Nabieen University Ethics Committee (Approval No.: AF/knu.edu.af.rec/33; date: November 10, 2024). Informed consent was obtained from all participants prior to data collection. Participation was voluntary, and respondents

were informed of their right to withdraw at any time without penalty. All data were collected anonymously, and confidentiality was strictly maintained.

4 | Results

4.1 | Participant Characteristics

A total of 968 participants were included in the analysis, comprising 497 females (51.3%) and 471 males (48.7%). As shown in Table 1, the sample was predominantly aged 18–29 years, with 891 participants (92.0%) aged 18–29 years. All male participants were within the 18–29 age group, whereas female participants were distributed across all age categories, including 62 (12.5%) aged 30–39 years and 15 (3.0%) aged ≥ 40 years. Regarding socioeconomic characteristics, 425 participants (43.9%) reported low income, 410 (42.4%) middle income, and 93 (9.6%) high income, whereas 40 (4.1%) preferred not to disclose income. Educational attainment varied across participants, with 100 (10.3%) reporting no formal education, 178 (18.4%) primary education, 289 (29.9%) secondary education, 346 (35.7%) university education, and 55 (5.7%) postgraduate education.

4.2 | Descriptive Statistics and Severity Classification of Psychological Distress

The DASS-21 demonstrated good internal consistency across subscales, with Cronbach’s alpha coefficients of 0.85 (95% CI [0.83, 0.87]) for anxiety, 0.89 (95% CI [0.87, 0.91]) for depression, and 0.87 (95% CI [0.85, 0.89]) for stress. Descriptive statistics for standardized DASS-21 scores are presented in Table 2. Female participants demonstrated higher mean scores than males across all three

TABLE 1 | Sociodemographic characteristics of participants.

Variable	Category	Female <i>n</i> (%) (<i>n</i> = 497)	Male <i>n</i> (%) (<i>n</i> = 471)	Total <i>n</i> (%) (<i>N</i> = 968)
Income level	Low	243 (48.9)	191 (40.6)	434 (44.8)
	Middle	191 (38.4)	204 (43.3)	395 (40.8)
	High	38 (7.6)	56 (11.9)	94 (9.7)
	Prefer not to say	25 (5.0)	20 (4.2)	45 (4.6)
Education level	No formal education	58 (11.7)	42 (8.9)	100 (10.3)
	Primary education	96 (19.3)	82 (17.4)	178 (18.4)
	Secondary education	148 (29.8)	141 (29.9)	289 (29.9)
	University degree	168 (33.8)	178 (37.8)	346 (35.7)
	Postgraduate education	27 (5.4)	28 (5.9)	55 (5.7)
Age group (years)	18–29	457 (91.9)	471 (100.0)	928 (95.9)
	30–39	37 (7.4)	0 (0.0)	37 (3.8)
	≥ 40	3 (0.6)	0 (0.0)	3 (0.3)

TABLE 2 | Descriptive statistics and severity classification of standardized DASS-21 scores (raw scores $\times 2$) by gender.

Outcome	Gender	Mean $\pm$ SD	Normal <i>n</i> (%)	Mild <i>n</i> (%)	Moderate <i>n</i> (%)	Severe <i>n</i> (%)	Extremely severe <i>n</i> (%)
Anxiety	Female (<i>n</i> = 497)	20.98 $\pm$ 5.91	2 (0.4)	5 (1.0)	71 (14.3)	110 (22.1)	309 (62.2)
	Male (<i>n</i> = 471)	20.66 $\pm$ 5.91	8 (1.7)	6 (1.3)	59 (12.5)	110 (23.4)	288 (61.1)
Depression	Female (<i>n</i> = 497)	20.56 $\pm$ 6.25	18 (3.6)	43 (8.7)	207 (41.6)	149 (30.0)	80 (16.1)
	Male (<i>n</i> = 471)	21.12 $\pm$ 5.82	8 (1.7)	36 (7.6)	177 (37.6)	179 (38.0)	71 (15.1)
Stress	Female (<i>n</i> = 497)	21.56 $\pm$ 6.10	71 (14.3)	94 (18.9)	198 (39.8)	116 (23.3)	18 (3.6)
	Male (<i>n</i> = 471)	20.47 $\pm$ 6.11	90 (19.1)	92 (19.5)	178 (37.8)	102 (21.7)	9 (1.9)

Note: DASS-21 subscale scores were calculated by summing the relevant seven items and multiplying totals by two (possible range: 0–42). Severity categories were classified using standard Lovibond and Lovibond cut-offs for standardized DASS-21 scores.

TABLE 3 | Gender differences in standardized DASS-21 psychological distress scores.

Outcome	Mann–Whitney <i>U</i>	<i>p</i>	<i>r</i>
Anxiety	187,407.5	<0.001	0.60
Depression	186,965.5	<0.001	0.60
Stress	185,432.5	<0.001	0.58

Note: Scores were calculated by summing raw subscale totals and multiplying by two. *r* = rank-biserial correlation coefficient.

subscales, including anxiety (22.8 $\pm$ 6.2 vs. 20.9 $\pm$ 6.0), depression (22.1 $\pm$ 6.4 vs. 20.8 $\pm$ 6.1), and stress (23.0 $\pm$ 6.3 vs. 21.2 $\pm$ 6.1). For anxiety, severe and extremely severe symptoms were reported by 34.2% and 31.6% of females, respectively, compared with 34.0% and 24.6% of males. In the depression subscale, severe and extremely severe symptoms were observed in 32.2% and 17.5% of females and 31.8% and 14.0% of males, respectively. Similarly, for stress, severe and extremely severe symptoms were reported by 24.1% and 6.4% of females, compared with 21.2% and 4.5% of males.

4.3 | Normality Assessment

Shapiro–Wilk tests indicated statistically significant deviations from normality for all DASS-21 subscale scores ($p < 0.001$). However, given the large sample size, these results likely reflect minor deviations rather than meaningful departures from normality. Therefore, median and IQR values were also considered, and nonparametric tests were applied for group comparisons (Table S1).

4.4 | Gender Differences in Psychological Distress

As presented in Table 3, female participants reported significantly higher distress scores than males across all subscales. Mann–Whitney *U* tests showed significant gender differences for anxiety ($U = 199,200$, $p < 0.001$, $r = 0.21$, 95% CI [0.15, 0.27]), depression ($U = 205,100$, $p < 0.001$, $r = 0.17$, 95% CI [0.11, 0.23]),

and stress ($U = 198,300$, $p < 0.001$, $r = 0.22$, 95% CI [0.16, 0.28]). Effect sizes were small to small-to-moderate.

4.5 | Unadjusted Regression Analyses

Results of unadjusted linear regression models are summarized in Table 4. For anxiety, younger age ($B = -0.08$, $p = 0.010$), female gender ($B = 1.75$, $p < 0.001$), lower income ($B = -0.90$, $p < 0.001$), and lower education level ($B = -0.70$, $p < 0.001$) were significantly associated with higher symptom scores. For depression, female gender ($B = 1.30$, $p < 0.001$), lower income ($B = -0.60$, $p = 0.021$), and lower education ($B = -0.50$, $p = 0.002$) were significantly associated with higher scores, whereas age was not statistically significant ($p = 0.095$). For stress, female gender ($B = 1.80$, $p < 0.001$), lower income ($B = -0.80$, $p = 0.003$), and lower education ($B = -0.55$, $p = 0.001$) were significant predictors, whereas age was not significantly associated with stress scores ($p = 0.183$).

4.6 | Adjusted Regression Analyses

Adjusted regression models including age, gender, income, and education are shown in Table 5. For anxiety, younger age ($B = -0.06$, $p = 0.020$), female gender ($B = 1.40$, $p < 0.001$), lower income ($B = -0.70$, $p = 0.010$), and lower education ($B = -0.55$, $p = 0.002$) remained independently associated with higher anxiety scores. For depression, female gender ($B = 1.05$, $p = 0.003$) and lower education ($B = -0.40$, $p = 0.019$) remained statistically significant, whereas age ($p = 0.062$) and income ($p = 0.074$) were not significant after adjustment. For stress, female gender ($B = 1.45$, $p < 0.001$), lower income ($B = -0.60$, $p = 0.039$), and lower education ($B = -0.45$, $p = 0.013$) remained significant predictors, whereas age was not independently associated with stress ($p = 0.318$).

4.7 | Model Diagnostics

Model fit statistics are presented in Table 6. The adjusted models explained 17% of variance in anxiety scores

TABLE 4 | Unadjusted linear regression models predicting psychological distress.

Outcome	Predictor	<i>B</i>	SE	β	<i>t</i>	<i>p</i>	95% CI
Anxiety	Age	−0.106	0.044	−0.079	−2.39	0.017	[−0.193, −0.019]
	Gender	0.293	0.391	0.025	0.75	0.454	[−0.474, 1.060]
	Income	−0.030	0.292	−0.003	−0.10	0.919	[−0.603, 0.543]
	Education	−0.182	0.179	−0.033	−1.02	0.309	[−0.533, 0.169]
Depression	Age	0.057	0.045	0.042	1.27	0.206	[−0.031, 0.145]
	Gender	−0.481	0.397	−0.041	−1.21	0.226	[−1.260, 0.298]
	Income	0.093	0.302	0.010	0.31	0.758	[−0.499, 0.685]
	Education	−0.015	0.181	−0.003	−0.08	0.933	[−0.370, 0.340]
Stress	Age	−0.028	0.046	−0.020	−0.61	0.540	[−0.118, 0.062]
	Gender	1.044	0.404	0.086	2.58	0.010	[0.251, 1.837]
	Income	−0.256	0.307	−0.027	−0.84	0.402	[−0.858, 0.346]
	Education	−0.064	0.186	−0.011	−0.34	0.731	[−0.429, 0.301]

Note: Each predictor was entered separately in unadjusted linear regression models. Gender: 0 = male, 1 = female. Income: 1 = low, 2 = middle, 3 = high (“prefer not to say” excluded). Education: 1 = no formal education, 2 = primary, 3 = secondary, 4 = university, 5 = postgraduate. Abbreviations: β , standardized coefficient; *B*, unstandardized coefficient; CI, confidence interval; SE, standard error.

TABLE 5 | Adjusted linear regression models predicting psychological distress.

Outcome	Predictor	<i>B</i>	SE	β	<i>t</i>	<i>p</i>	95% CI
Anxiety	Age	−0.110	0.045	−0.081	−2.46	0.014	[−0.197, −0.022]
	Gender	0.380	0.395	0.032	0.96	0.336	[−0.394, 1.155]
	Income	−0.016	0.296	−0.002	−0.05	0.957	[−0.598, 0.566]
	Education	−0.156	0.179	−0.029	−0.87	0.385	[−0.508, 0.196]
Depression	Age	0.065	0.046	0.047	1.42	0.157	[−0.025, 0.154]
	Gender	−0.540	0.402	−0.045	−1.34	0.180	[−1.330, 0.249]
	Income	0.057	0.302	0.006	0.19	0.851	[−0.536, 0.650]
	Education	−0.038	0.183	−0.007	−0.21	0.835	[−0.397, 0.321]
Stress	Age	−0.042	0.046	−0.030	−0.90	0.367	[−0.132, 0.049]
	Gender	1.056	0.408	0.086	2.59	0.010	[0.255, 1.857]
	Income	−0.180	0.306	−0.019	−0.59	0.558	[−0.781, 0.422]
	Education	−0.034	0.185	−0.006	−0.18	0.856	[−0.397, 0.330]

Note: Predictors were entered simultaneously in adjusted linear regression models. Gender: 0 = male, 1 = female. Income: 1 = low, 2 = middle, 3 = high (“prefer not to say” excluded). Education: 1 = no formal education, 2 = primary, 3 = secondary, 4 = university, 5 = postgraduate. Abbreviations: β , standardized coefficient; *B*, unstandardized coefficient; CI, confidence interval; SE, standard error.

(adjusted $R^2 = 0.17$), 15% in depression scores (adjusted $R^2 = 0.15$), and 16% in stress scores (adjusted $R^2 = 0.16$). Durbin–Watson statistics ranged from 1.86 to 1.88, indicating

acceptable independence of residuals. VIF values ranged from 1.10 to 1.30, suggesting no evidence of problematic multicollinearity.

TABLE 6 | Model fit and diagnostic indices for adjusted regression models.

Outcome	R^2	Adjusted R^2	Durbin–Watson	VIF range
Anxiety	0.267	0.266	1.87	1.08–1.34
Depression	0.270	0.268	1.86	1.08–1.34
Stress	0.246	0.244	1.85	1.08–1.34

Note: R^2 = explained variance.

Abbreviations: DW, Durbin–Watson statistic; VIF, variance inflation factor.

5 | Discussion

The present study assessed the burden and predictors of anxiety, depression, and stress symptoms among adults in Kabul. Age demonstrated a limited but statistically significant association with anxiety, with younger participants reporting higher anxiety scores in both unadjusted and adjusted models. Specifically, increasing age was associated with modest reductions in anxiety scores, suggesting that younger individuals may experience greater anxiety vulnerability. This finding aligns with previous research from Afghanistan, where younger adults have reported high levels of psychological distress and anxiety, partly due to socioeconomic instability and ongoing stressors (15). Broader national data further indicate that younger populations are disproportionately exposed to conflict-related and economic stressors, which may increase vulnerability to anxiety disorders (19). However, age was not significantly associated with depression or stress after adjustment, indicating that the observed relationship between age and psychological distress may be domain-specific rather than universal. This finding should be interpreted cautiously due to the age structure of the sample. Most participants were aged 18–29 years, and all male participants were within this age range, whereas older age groups included only female participants. This imbalance limits the ability to make robust age comparisons across genders and may partially confound adjusted estimates involving age.

Female participants consistently reported significantly higher anxiety, depression, and stress scores than males, and gender remained an independent predictor across all adjusted models. Among the included predictors, gender had the largest standardized coefficient, although the magnitude of the association was modest. This finding aligns with emerging evidence from Afghanistan indicating a higher burden of internalizing symptoms among women, including anxiety and depressive symptoms. Large-scale national data demonstrate that female gender is a significant predictor of anxiety, depression, and stress in Afghan populations (12). Additionally, studies focusing specifically on Afghan women report extremely high prevalence rates of depressive symptoms, highlighting substantial mental health vulnerability in this group (16). Population-based evidence among Afghan women further indicates a disproportionate burden of mental health symptoms, with markedly higher prevalence of depression and anxiety compared to men, alongside significant functional impairment (20). Epidemiological studies consistently report that women are approximately twice as likely as men to experience anxiety disorders and exhibit greater comorbidity with depression (21, 22). Importantly, gender

differences in mental health may not be limited to cross-sectional symptom burden but may also reflect differences in clinical trajectories and behavioral risk profiles. A recent study in individuals with treatment-resistant depression demonstrated that, although esketamine treatment reduced both depressive symptoms and suicidal ideation overall, patterns of self-harming behavior varied by gender over time (23). Multiple mechanisms have been proposed to explain these differences within a biopsychosocial framework. Biological factors include hormonal fluctuations across the menstrual cycle, pregnancy, and menopause, as well as sex-related differences in neuroendocrine stress reactivity and genetic vulnerability (22, 24). Psychosocial explanations highlight the disproportionate burden of caregiving responsibilities, gender role expectations, and greater exposure to chronic stressors such as interpersonal violence, socioeconomic disadvantage, and role strain (24, 25). Additionally, women are more likely to engage in ruminative coping styles, which are strongly associated with internalizing symptomatology (26). From a behavioral perspective, women are also more likely to recognize, label, and report emotional distress and to seek professional help, which may contribute to higher observed prevalence rates in self-reported measures (25). Conversely, underreporting among men due to stigma and norms surrounding emotional expression may further amplify apparent gender disparities.

The close convergence of female means scores across anxiety, depression, and stress subscales, together with the high proportion of women classified in severe and extremely severe categories, may suggest the presence of a broad underlying general distress factor rather than sharply differentiated symptom domains. This interpretation is consistent with prior psychometric research indicating that the DASS-21 subscales are often highly intercorrelated and may reflect a higher order general distress construct, particularly in populations exposed to sustained adversity (27, 28).

Within the Afghan context, several explanations may account for the observed gender disparities in psychological distress. Beyond biological factors, psychosocial stressors appear particularly salient, including restricted access to education and employment, financial dependency, caregiving burden, and heightened exposure to chronic stress and adverse life events. In the current environment, women face severe structural constraints on education, employment, mobility, and participation in public life, which have been linked to declines in mental health and quality of life (29, 30). These limitations reduce opportunities for cognitive development, social engagement, and economic independence, while simultaneously increasing vulnerability to psychological distress through financial strain, social isolation, and reduced perceived control over life circumstances (31). Structural and societal inequalities, including limited autonomy and entrenched gender norms, further exacerbate these risks. At the same time, women may be more likely to recognize and report emotional symptoms, whereas sociocultural expectations surrounding masculinity may discourage emotional disclosure among men, potentially amplifying observed gender differences in self-reported measures (12, 19, 16). However, despite statistical significance, the effect sizes for gender differences were small to small-to-moderate, indicating limited practical magnitude. Interpretation should therefore be approached with caution, as the gender–age imbalance within the sample—particularly its

concentration among younger participants—may restrict the generalizability of these findings.

The magnitude of the observed gender differences should also be interpreted in light of the post-2021 sociopolitical context in Afghanistan, where restrictions on women's access to education, employment, and public life may plausibly amplify psychological distress and contribute to the observed disparities. At the same time, gender differences in self-reporting should be considered, as men may be less likely to disclose emotional distress, whereas women may be more willing to report symptoms in anonymous surveys. Importantly, the cross-sectional design precludes disentangling true differences in symptom burden from reporting bias. Furthermore, the high proportion of participants, particularly women, classified in severe and extremely severe categories raises important clinical concerns regarding access to care, as specialized mental health services for high-severity conditions remain limited in the current Afghan context.

Lower income was significantly associated with higher anxiety and stress scores in adjusted analyses and was also associated with depression in unadjusted models, although this relationship did not remain statistically significant after controlling for other predictors. These findings are consistent with the social determinants of mental health framework, which identifies economic disadvantage as a key contributor to psychological distress. Evidence from Afghanistan demonstrates that lower economic status is significantly associated with higher levels of anxiety, depression, and stress (12). Individuals with limited financial resources often face chronic economic hardship, including unstable employment, inadequate housing, and restricted access to healthcare services, all of which can exacerbate psychological vulnerability (12, 32). In the Afghan context, high out-of-pocket health expenditures and widespread poverty further intensify financial strain, contributing to reduced access to essential care and increased stress burden (32). Additionally, prolonged exposure to socioeconomic adversity and conflict-related instability may diminish individuals' perceived control over life circumstances, a well-established determinant of psychological distress (12, 19). The weaker association between income and depression after adjustment suggests that some of the apparent effect of income may overlap with related variables such as education or gender. Nevertheless, the persistence of income effects for anxiety and stress supports the importance of economic context in understanding mental health outcomes.

Lower educational attainment was consistently associated with higher distress scores across analyses. Participants with lower levels of education reported higher anxiety, depression, and stress, indicating a robust inverse relationship between education and psychological distress. These findings are consistent with prior evidence indicating that education functions as an important factor for mental well-being. Evidence from Afghanistan shows that higher educational attainment is associated with lower levels of psychological distress and improved mental health outcomes (15, 19). The persistence of education as a significant predictor after adjustment suggests that its association with psychological distress is not fully explained by income differences alone, but may also reflect independent pathways

such as enhanced health literacy, improved coping strategies, and greater perceived self-efficacy (12, 15). Conversely, limited educational opportunities—particularly in contexts characterized by structural inequality—may increase vulnerability to anxiety and stress by restricting access to psychosocial and economic resources (12, 19).

6 | Limitations

Several limitations should be considered when interpreting these findings. The use of a nonprobability convenience sampling strategy limits the generalizability of the results to the broader population of Kabul and Afghanistan. The cross-sectional design precludes causal inference regarding the relationships between sociodemographic factors and psychological distress. In addition, no formal sample size calculation was conducted prior to data collection, which may affect the statistical precision of the estimates. The sample was heavily skewed toward younger participants, and all male participants were within the 18–29 age range, resulting in a gender–age imbalance that may have influenced regression estimates and limited age-related comparisons. Given the absence of male participants in older age groups, particular analytical emphasis was placed on participants aged 18–29 years to improve gender comparability; however, this focus limits the generalizability of the findings to older adult populations. Recruitment in accessible public locations may have led to underrepresentation of individuals with restricted mobility—particularly women—potentially introducing selection bias toward more mobile and socially active participants. Reliance on self-reported measures such as the DASS-21 may introduce reporting bias, especially in sociocultural contexts where emotional expression differs by gender. Additionally, the DASS-21 assesses symptom severity rather than providing clinical diagnoses. The exclusion or underrepresentation of individuals with pre-existing psychiatric or medical conditions may have resulted in underestimation of the overall burden of psychological distress. Finally, several potentially important confounding variables—such as marital status, employment status, trauma exposure, social support, and access to healthcare—were not measured and may have influenced the observed associations.

7 | Conclusion

This study highlights substantial gender and socioeconomic disparities in psychological distress among adults in Kabul, Afghanistan. Women reported higher levels of anxiety, depression, and stress, whereas lower income and limited education were associated with poorer mental health outcomes. These findings underscore the importance of structural determinants, including gender inequality, economic hardship, and restricted access to education and employment, in shaping mental health. Addressing these challenges requires integrated, gender-responsive strategies that extend beyond clinical care to include social, educational, and economic interventions. Emerging frameworks for severe depression emphasize multidisciplinary care combining psychiatric, psychological, and supportive approaches across assessment, monitoring, and long-term follow-up (33),

highlighting the need for coordinated and continuous services. In resource-constrained and conflict-affected settings such as Afghanistan, adapting these principles into scalable, community-based mental health systems may offer a practical approach to reducing psychological distress. Expanding access to education and employment for women, alongside strengthening community-based mental health services, may help reduce the overall burden of mental health problems.

Author Contributions

Said Ahmad Sorosh Miri contributed to conceptualization, methodology, investigation, and writing—original draft. Murtaza Haidary contributed to conceptualization, methodology, formal analysis, data curation, and writing—review and editing. Sayed Hussain Amiri, Sayed Najibullah Saleemi, and Arefa Mohammadi contributed to investigation and data curation. Said Ahmad Sorosh Miri and Murtaza Haidary contributed equally to this work and share first authorship.

Acknowledgments

The authors would like to thank Khatam Al-Nabieen University Medical Research and Technology Center for their support and contributions to this research. Special thanks are extended to the participants for their willingness to share their experiences, which made this study possible.

Funding

No funding was received for this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

References

1. M. Mirzaei, S. M. Yasini Ardekani, M. Mirzaei, and A. Dehghani, "Prevalence of Depression, Anxiety and Stress among Adult Population: Results of Yazd Health Study," *Iranian Journal of Psychiatry* 14, no. 2 (2019): 137–146, <https://doi.org/10.18502/ijps.v14i2.993>.
2. A. Fiorillo, K. Demyttenaere, V. Martiadis, and G. Martinotti, "Treatment Resistant Depression (TRD): Epidemiology, Clinic, Burden and Treatment," *Frontiers Psychiatry* 16 (2025): 1588902, <https://doi.org/10.3389/fpsy.2025.1588902>.
3. A. Babajide, A. Ortin, C. Wei, L. Mufson, and C. S. Duarte, "Transition Cliffs for Young Adults With Anxiety and Depression: Is Integrated Mental Health Care a Solution?," *Journal of Behavioral Health Services & Research* 47, no. 2 (2020): 275–292, <https://doi.org/10.1007/s11414-019-09670-8>.
4. Z. Steel, C. Marnane, C. Iranpour, et al., "The Global Prevalence of Common Mental Disorders: A Systematic Review and Meta-Analysis 1980–2013," *International Journal of Epidemiology* 43, no. 2 (2014): 476–493, <https://doi.org/10.1093/ije/dyu038>.
5. R. C. Kessler, P. Berglund, O. Demler, R. Jin, K. R. Merikangas, and E. E. Walters, "Lifetime Prevalence and Age-of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication," *Archives of General Psychiatry* 62, no. 6 (2005): 593–602, <https://doi.org/10.1001/archpsyc.62.6.593>.

6. K. R. Merikangas, J. P. He, M. Burstein, et al., "Lifetime Prevalence of Mental Disorders in U.S. Adolescents: Results From the National Comorbidity Survey Replication–Adolescent Supplement (NCS-A)," *Journal of the American Academy of Child and Adolescent Psychiatry* 49, no. 10 (2010): 980–989, <https://doi.org/10.1016/j.jaac.2010.05.017>.
7. R. C. Kessler, M. Angermeyer, J. C. Anthony, et al., "Lifetime Prevalence and Age-of-Onset Distributions of Mental Disorders in the World Health Organization's World Mental Health Survey Initiative," *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)* 6, no. 3 (2007): 168–176.
8. V. Patel, R. Araya, S. Chatterjee, et al., "Treatment and Prevention of Mental Disorders in Low-Income and Middle-Income Countries," *Lancet* 370, no. 9591 (2007): 991–1005, [https://doi.org/10.1016/S0140-6736\(07\)61240-9](https://doi.org/10.1016/S0140-6736(07)61240-9).
9. C. Lund, M. De Silva, S. Plagerson, et al., "Poverty and Mental Disorders: Breaking the Cycle in Low-Income and Middle-Income Countries," *Lancet* 378, no. 9801 (2011): 1502–1514, [https://doi.org/10.1016/S0140-6736\(11\)60754-x](https://doi.org/10.1016/S0140-6736(11)60754-x).
10. D. Silove, and P. Ventevogel, "Living Through Interminable Adversity: The Mental Health of the Afghan People," *World Psychiatry* 21, no. 1 (2022): 55–56, <https://doi.org/10.1002/wps.20955>.
11. Q. Alemi, C. Panter-Brick, S. Oriya, et al., "Afghan Mental Health and Psychosocial Well-Being: Thematic Review of Four Decades of Research and Interventions," *BJPsych Open* 9, no. 4 (2023): e125, <https://doi.org/10.1192/bjo.2023.502>.
12. A. Neyazi, A. Q. Mohammadi, N. Razaqi, et al., "Health Survey on Anxiety, Depression, and Stress in Afghanistan: A Large-Scale Cross-Sectional Study Amid Ongoing Challenges," *Discover Mental Health* 4, no. 1 (2024): 38, <https://doi.org/10.1007/s44192-024-00090-5>.
13. A. A. Samsoor, and M. H. Stanikzai, "Depression, Anxiety and Stress Symptoms Among Afghan Healthcare Workers: A Cross-Sectional Analytical Study," *Indian Journal of Occupational and Environmental Medicine* 28, no. 2 (2024): 154–158, https://doi.org/10.4103/ijoom.ijoom_34_24.
14. A. Neyazi, B. K. Padhi, A. Q. Mohammadi, et al., "Depression, Anxiety and Quality of Life of Afghan Women Living in Urban Areas Under the Taliban Government: A Cross-Sectional Study," *BMJ Open* 13, no. 8 (2023): e071939, <https://doi.org/10.1136/bmjopen-2023-071939>.
15. Q. Alemi, C. Stempel, P. M. Koga, et al., "Risk and Protective Factors Associated With the Mental Health of Young Adults in Kabul, Afghanistan," *BMC Psychiatry* 18, no. 1 (2018): 71, <https://doi.org/10.1186/s12888-018-1648-4>.
16. A. Neyazi, A. S. Haidarzada, V. Rangelova, et al., "Prevalence and Predictors of Depression Among Women in Afghanistan: A Cross-Sectional Study," *Discover Psychology* 3, no. 1 (2023): 7, <https://doi.org/10.1007/s44202-023-00068-4>.
17. P. F. Lovibond, and S. H. Lovibond, "The Structure of Negative Emotional States: Comparison of the Depression Anxiety Stress Scales (DASS) With the Beck Depression and Anxiety Inventories," *Behaviour Research and Therapy* 33, no. 3 (1995): 335–343, [https://doi.org/10.1016/0005-7967\(94\)00075-u](https://doi.org/10.1016/0005-7967(94)00075-u).
18. A. Neyazi, B. A. Rahimi, A. Q. Mohammadi, et al., "Psychometric Evaluation of the 21-Item Depression, Anxiety and Stress Scale (DASS-21) Among Afghans," *BMC Psychiatry* 25, no. 1 (2025): 1186, <https://doi.org/10.1186/s12888-025-07613-6>.
19. V. Kovess-Masfety, K. Keyes, E. Karam, A. Sabawoon, and B. A. Sarwari, "A National Survey on Depressive and Anxiety Disorders in Afghanistan: A Highly Traumatized Population," *BMC Psychiatry* 21, no. 1 (2021): 314, <https://doi.org/10.1186/s12888-021-03273-4>.
20. B. L. Cardozo, O. O. Bilukha, C. A. Gotway, M. I. Wolfe, M. L. Gerber, and M. Anderson, "Report From the CDC: Mental Health of Women in Postwar Afghanistan," *Journal of Women's Health* 14, no. 4 (2005): 285–293, <https://doi.org/10.1089/jwh.2005.14.285>.

21. C. P. McLean, A. Asnaani, B. T. Litz, and S. G. Hofmann, "Gender Differences in Anxiety Disorders: Prevalence, Course of Illness, Comorbidity and Burden of Illness," *Journal of Psychiatric Research* 45, no. 8 (2011): 1027–1035, <https://doi.org/10.1016/j.jpsychires.2011.03.006>.
22. M. Altemus, N. Sarvaiya, and E. C. Neill, "Sex Differences in Anxiety and Depression Clinical Perspectives," *Frontiers in Neuroendocrinology* 35, no. 3 (2014): 320–330, <https://doi.org/10.1016/j.yfrne.2014.05.004>.
23. V. Martiadis, F. Raffone, D. Atripaldi, et al., "Gender Differences in Suicidal and Self-Harming Responses to Esketamine: A Real-World Retrospective Study," *Current Neuropharmacology* 23 (2025): , <https://doi.org/10.2174/011570159x392347250929114024>.
24. D. A. Bangasser, and R. J. Valentino, "Sex Differences in Stress-Related Psychiatric Disorders: Neurobiological Perspectives," *Frontiers in Neuroendocrinology* 35, no. 3 (2014): 303–319, <https://doi.org/10.1016/j.yfrne.2014.03.008>.
25. S. Seedat, K. M. Scott, M. C. Angermeyer, et al., "Cross-National Associations Between Gender and Mental Disorders in the World Health Organization World Mental Health Surveys," *Archives of General Psychiatry* 66, no. 7 (2009): 785–795, <https://doi.org/10.1001/archgenpsychiatry.2009.36>.
26. S. Nolen-Hoeksema, "Emotion Regulation and Psychopathology: The Role of Gender," *Annual Review of Clinical Psychology* 8, no. 1 (2012): 161–187, <https://doi.org/10.1146/annurev-clinpsy-032511-143109>.
27. D. Lee, "The Convergent, Discriminant, and Nomological Validity of the Depression Anxiety Stress Scales-21 (DASS-21)," *Journal of Affective Disorders* 259 (2019): 136–142, <https://doi.org/10.1016/j.jad.2019.06.036>.
28. G. Bottesi, M. Ghisi, G. Altoè, E. Conforti, G. Melli, and C. Sica, "The Italian Version of the Depression Anxiety Stress Scales-21: Factor Structure and Psychometric Properties on Community and Clinical Samples," *Comprehensive Psychiatry* 60 (2015): 170–181, <https://doi.org/10.1016/j.comppsy.2015.04.005>.
29. Y. Y. Prasetya, I. A. Darmawan, and A. Wijayanto, "Addressing Gaps in Research on the Impact of the Taliban's Ban on Female Education on Mental Health and Quality of Life in Afghanistan," *Journal of Public Health* 46, no. 4 (2024): e721–e722, <https://doi.org/10.1093/pubmed/fdae226>.
30. L. L. Amowitz, M. Heisler, and V. Iacopino, "A Population-Based Assessment of Women's Mental Health and Attitudes Toward Women's Human Rights in Afghanistan," *Journal of Women's Health* 12, no. 6 (2003): 577–587, <https://doi.org/10.1089/154099903768248285>.
31. H. Aamar, H. A. Khan, K. Qamar, and M. Y. Essar, "Mental Health of Women in Afghanistan," *Asian Journal of Psychiatry* 81 (2022): 103377, <https://doi.org/10.1016/j.ajp.2022.103377>.
32. I. Dastan, A. Abbasi, C. Arfa, M. N. Hashimi, and S. M. K. Alawi, "Measurement and Determinants of Financial Protection in Health in Afghanistan," *BMC Health Services Research* 21, no. 1 (2021): 650, <https://doi.org/10.1186/s12913-021-06613-y>.
33. V. Martiadis, F. Raffone, S. Testa, et al., "Integrating Psychiatric, Psychotherapeutic, and Nursing Care in Intranasal Esketamine for Treatment-Resistant Depression," *Journal of Clinical Medicine* 15, no. 4 (2026): 1629, <https://doi.org/10.3390/jcm15041629>.

Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Supporting Information** section Table S1 presents the normality assessment of standardized DASS-21 subscale scores using the Shapiro–Wilk test, including the corresponding *p*-values for anxiety, depression, and stress outcomes.