Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Prevalence and Associated Factors of Generalized Anxiety Disorder Severity Among Mothers Attending Maternal and Child Health Centres in Hargeisa, Somaliland: A Cross- Sectional Study

Egal Jama Guled

egaljama143@gmail.com

SIRTA-Somaliland Institute for Research and Training, Hargeisa, Somaliland

Mohamed Farah Handule

Frantz Fanon University

Abdirashid Muhumed Guled

Amoud University

Mohamed Abdilahi Mohamed

Gollis University

Research Article

Keywords: generalized anxiety disorder, GAD-7, parity, social support, Maternal and Child Health, Somaliland

Posted Date: November 16th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11308136/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

Methods

This facility-based cross-sectional study therefore examined the prevalence and associated factors of GAD among 315 mothers attending four MCH centres in Hargeisa, recruited through stratified random sampling with proportional allocation and systematic sampling within strata. Anxiety symptoms were measured using the 7-item Generalized Anxiety Disorder scale (GAD-7), alongside structured interviews capturing socio-demographic, psychological, and obstetric characteristics. Associations with GAD severity were assessed using chi-square tests and multivariable ordinal logistic regression.

Results

Findings revealed that 73.7% of participants exhibited at least mild anxiety symptoms, with 47.0% classified as mild, 7.9% moderate, and 18.7% severe. In the adjusted model, advancing maternal age, housewife occupation, and higher household income were independently associated with reduced odds of greater GAD severity, while the absence of frequent stress was strongly protective. Inadequate social support emerged as the most substantial psychosocial risk factor, and parity of three or more births constituted the strongest overall risk factor.

Conclusion

These findings indicate that maternal GAD is highly prevalent among Hargeisa's MCH attendees and is shaped by an interdependent constellation of socio-economic, psychological, and reproductive determinants. High parity represents a particularly salient, previously underappreciated risk marker. The integration of brief, routine anxiety screening within MCH services prioritising young, economically disadvantaged, and high-parity mothers is strongly warranted to strengthen maternal mental health outcomes in this setting.

Introduction

Anxiety disorders are the most prevalent mental health problems that affect women during their childbearing years. The pregnancy and postpartum periods represent windows of heightened vulnerability to maternal mental health morbidity. (1, 2). Untreated maternal anxiety is associated with adverse obstetric and neonatal outcomes, including preterm birth, and can compromise mother–infant bonding and longer-term child development. (3, 4). In sub-Saharan Africa, the burden of maternal anxiety is substantial but unevenly documented. Facility-based studies using the GAD-7 report prevalence estimates ranging from approximately 13% in Uganda (5) to 32–44% in Ethiopia (6, 7), with a pooled East African antenatal estimate of 29% (7) and a broader pooled GAD prevalence across 33 low- and middle-income countries of 22.2%, rising to 27.6% in lower-middle-income countries (8). Evidence from

elsewhere in the Horn of Africa, including Sudan(9) and Egypt (10), similarly indicates a high regional burden of perinatal anxiety and depression, frequently compounded by domestic violence and limited formal mental health infrastructure.

Despite this regional evidence base, no peer-reviewed study has examined maternal GAD among women attending MCH centres in Somaliland. Decades of political instability and the near-collapse of formal mental health services in the region are likely to have elevated psychosocial vulnerability among pregnant and postpartum women, yet MCH services, the principal point of contact for maternal healthcare in Somaliland, do not routinely screen for mental health conditions.

Existing regional literature also rarely disaggregates gravidity (number of pregnancies) from parity (number of births) as distinct correlates of maternal anxiety, despite evidence that they may operate in opposite directions: nulliparity or primigravidity has been linked to heightened anxiety in some settings, plausibly reflecting inexperience with childbirth (6, 11), whereas high parity may separately reflect a cumulative caregiving and socio-economic burden. Clarifying this distinction has direct implications for how MCH-based screening should be targeted.

This study therefore aimed to determine the prevalence of GAD and to identify its independent socio-demographic, psychological, and obstetric correlates among mothers attending MCH centres in Hargeisa, Somaliland, providing the first context-specific evidence to inform the integration of mental health screening into routine maternal care in this setting.

Methods

Study design and setting

A facility-based, cross-sectional study was conducted between February and July 2026 at four Maternal and Child Health (MCH) centres in Hargeisa (Sahardid, Iftin, New-Hargeisa, and Gurya-samo MCH), the capital of Somaliland. These centres provide antenatal care, postnatal care, and immunisation services and are the principal point of contact with the formal health system for pregnant and postpartum women in the city.

Study population and eligibility

The study population comprised pregnant and postpartum mothers attending the four MCH centres during the study period. The study included pregnant and postpartum mothers attending selected MCH centres who provided informed consent. Mothers unable to complete the interview or unwilling to participate were excluded.

Sample size and sampling procedure

The sample size was calculated using the single-population proportion formula:

$$n_0 = \frac{Z^2 \cdot P(1-P)}{d^2}$$

Where: $\varvec{n_0}$ is the initial sample size. $\varvec{Z}$ is the standard normal deviate (1.96 for 95% CI). $\varvec{P}$ is the anticipated prevalence (0.50). $\varvec{d}$ is the margin of error (0.05).

To account for the finite source population ($N = 1,123$), the finite-population correction (FPC) was applied:

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

The final sample size, including a 10% non-response allowance, was 315.

A stratified random sampling technique was used, with each MCH centre as a stratum and the sample proportionally allocated according to registered attendance (New-Hargeisa MCH n = 84; Sahardid MCH n = 79; Guryo-Samo MCH n = 76; Iftin MCH n = 76). Within each stratum, participants were selected using systematic random sampling based on daily attendance flow.

Measures

GAD symptoms over the preceding two weeks were assessed using the 7-item Generalized Anxiety Disorder scale (GAD-7), a widely validated self-report instrument scored 0–21, with standard severity bands of 0–4 (no anxiety), 5–9 (mild), 10–14 (moderate), and 15–21 (severe) (12). Socio-demographic variables (age, marital status, education, occupation, monthly income, residence), psychological variables (perceived frequent stress, adequate social support, family conflict, and prior history of mental illness; each dichotomised as yes/no), and obstetric variables (gravidity, parity, whether the current pregnancy was planned, and current pregnancy complications) were collected using a structured, interviewer-administered questionnaire.

Data quality

The questionnaire was pre-tested and reviewed for content validity. internal consistency for the GAD-7 and other scales was assessed using Cronbach's alpha (α):

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum \sigma_i^2}{\sigma_t^2}\right)$$

Where: $\varvec{k}$ is the number of items. $\varvec{\sigma}^{2}_{\varvec{i}}$ is the variance of item i. $\varvec{\sigma}^{2}_{\varvec{t}}$ is the total variance of the scale. was acceptable to excellent for the psychological factors subscale (α = .85), the obstetric factors subscale (α = .75), and the GAD-7 (α = .95).

Statistical analysis

Data were analysed in STATA. Descriptive statistics summarised participant characteristics and GAD severity distribution. Bivariate associations between each independent variable and GAD severity were assessed using the chi-square test. All variables were subsequently entered into a multivariable ordinal logistic regression model, appropriate given the four ordered outcome categories, to identify independent predictors of GAD severity; adjusted odds ratios (AORs) with 95% confidence intervals are reported. Statistical significance was set at p<.05.

Bivariate Analysis

Bivariate associations were assessed using the Pearson Chi-square test. The degree of freedom (df) for each association in the Results table was calculated as:

$$degree\,(df) = (r-1) \times\ (c-1)$$

Where: $\varvec{r}$ is the number of rows (categories of the independent variable). $\varvec{c}$ is the number of columns (the four GAD-7 severity levels).

Multivariable Modelling

A multivariable ordinal logistic regression was used to identify independent predictors. The model is based on cumulative probabilities:

$$logit\left[P\left(Y \leq\ j\right)\right] = \ln\left(\frac{P\left(Y \leq\ j\right)}{P\left(Y > j\right)}\right) = \alpha_{\,j} - \beta_{\,i} X_i$$

Where: $\varvec{j}$ represents the thresholds of GAD severity (0–3). $\varvec{\alpha}_{\varvec{j}}$ is the intercept for category $\varvec{j}$. $\varvec{\beta}_{\varvec{i}}$ represents the regression coefficients.

The Adjusted Odds Ratios (AOR) reported in Table 2 were calculated as:

$$AOR = e^{\beta}$$

The overall model fit was evaluated using the Pseudo R^2 (McFadden's):

$$PseudoR^2 = 1 - \frac{\ln\widehat{L}_{full}}{\ln\widehat{L}_{null}}$$

Ethical considerations

Ethical approval

was obtained from the Institutional Review Board of Frantz Fanon University. The study was conducted in accordance with the ethical standards of the Declaration of Helsinki. Permission was granted by the Ministry of Health Development, Somaliland, through the Maroodi-Jeex Regional Health Coordinator, and by the management of each participating MCH centre. Written informed consent was obtained from all participants; participation was voluntary and confidential, and participants were free to withdraw at any time without affecting their care.

Results

A total of 315 mothers were enrolled; 312 were included in the final multivariable model after exclusion of cases with incomplete data. Participant characteristics are summarised in Table 1. More than half of participants were under 20 years of age (53.7%), the large majority were married (92.1%), had no formal education (66.7%), and were housewives (67.9%). Most households reported a medium monthly income (79.1%), and 93.7% of participants resided in urban areas. Regarding psychological characteristics, 76.4% of mothers reported frequently feeling stressed, 84.4% reported adequate social support, 23.9% reported family conflict, and 7.9% reported a prior history of mental illness. Obstetrically, 51.1% of mothers had experienced two to three pregnancies, 54.9% had no previous live birth, 67.9% had planned their current pregnancy, and 18.5% reported pregnancy complications.

Table 1
Participant characteristics (N = 315)

Characteristic	Category	N	%
Age	< 20 years	169	53.7
	20–29 years	85	27.0
	30–39 years	48	15.2
	≥ 40 years	13	4.1
Marital status	Married	290	92.1
	Divorced	19	6.0
	Widowed	6	1.9
Education	No formal education	210	66.7
	Primary	47	14.9
	Secondary	24	7.6
	Tertiary	34	10.8
Occupation	Unemployed	48	15.2
	Housewife	214	67.9
	Employed	28	8.9
	Self-employed	25	7.9
Monthly income	Low	59	18.7
	Medium	249	79.1
	High	7	2.2
Residence	Urban	295	93.7
	Rural	20	6.3
Often feels stressed	Yes	240	76.4
	No	74	23.6
Adequate social support	Yes	266	84.4
	No	49	15.6
Family conflict	Yes	75	23.9
	No	239	76.1
History of mental illness	Yes	25	7.9

Characteristic	Category	N	%
	No	290	92.1
Gravidity	1	31	9.8
	2–3	161	51.1
	≥ 4	123	39.1
Parity	0	173	54.9
	1–2	60	19.0
	≥ 3	82	26.0
Pregnancy planned	Yes	214	67.9
	No	101	32.1
Pregnancy complications	Yes	58	18.5
	No	256	81.5

The above Table 1, Participant characteristics (N 315 N = 315) show that the cohort is predominantly young, with over half aged under 20 years (53.7%), married (92.1%), and residing in urban areas (93.7%). The majority of mothers have no formal education (66.7%), are housewives (67.9%), and report a medium household monthly income (79.1%). Psychologically, a substantial majority experience frequent stress (76.4%), though most report adequate social support (84.4%), with smaller proportions experiencing family conflict (23.9%) or a history of mental illness (7.9%). Obstetrically, most participants have a gravidity of 2 to 3 (51.1%) and zero previous live births (54.9% parity of 0), with over two-thirds reporting that their current pregnancy was planned (67.9%) and 18.5% experiencing pregnancy complications.

Table 2
Prevalence of GAD

Anxiety Level	Proportion	Std. err	95% CI
No Anxiety	.263	.025	[.218, .315]
Mild Anxiety	.470	.028	[.415, .525]
Moderate Anxiety	.079	.015	[.054, .115]
Severe Anxiety	.187	.022	[.148, .234]

According to Table 2 on the GAD-7, 26.3% (95% CI 21.8–31.5) of mothers had no anxiety, 47.0% (95% CI 41.5–52.5) had mild anxiety, 7.9% (95% CI 5.4–11.5) had moderate anxiety, and 18.7% (95% CI 14.8–23.4) had severe anxiety. Overall, 73.7% of mothers presented with at least mild symptoms, and 26.6% had moderate-to-severe symptoms.

Table 3
Bivariate associations

Variables	No Anxiety	Mild Anxiety	Moderate Anxiety	Severe Anxiety	χ2	df	P
Age					164.37	9	< .001
< 20 years	7 (4.14)	131 (77.51)	16 (9.47)	15 (8.88)			
20–29 years	47 (55.29)	10 (11.76)	3 (3.53)	25 (29.41)			
30–39 years	23 (47.92)	4 (8.33)	5 (10.42)	16 (33.33)			
≥ 40 years	6 (46.15)	3 (23.08)	1 (7.69)	3 (23.08)			
Marital Status					17.41	6	.008
Married	77 (26.55)	144 (49.66)	21 (7.24)	48 (16.55)			
Divorced	5 (26.32)	3 (15.79)	3 (15.79)	8 (42.11)			
Widowed	1 (16.67)	1 (16.67)	1 (16.67)	3 (50.00)			
Education Level					115.89	9	< .001
No formal education	19 (9.05)	135 (64.29)	19 (9.05)	37 (17.62)			
Primary	26 (55.32)	9 (19.15)	3 (6.38)	9 (19.15)			
Secondary	15 (62.50)	2 (8.33)	2 (8.33)	5 (20.83)			
Tertiary	23 (67.65)	2 (5.88)	1 (2.94)	8 (23.53)			
Occupation					114.95	9	< .001
Unemployed	16 (33.33)	6 (12.50)	2 (4.17)	24 (50.00)			
Housewife	42 (19.63)	137 (64.02)	19 (8.88)	16 (7.48)			
Employed	9 (32.14)	3 (10.71)	2 (7.14)	14 (50.00)			
Self-employed	16 (64.00)	2 (8.00)	2 (8.00)	5 (20.00)			
Monthly Income					124.63	6	< .001
Low	8 (13.56)	7 (11.86)	5 (8.47)	39 (66.10)			

Variables	No Anxiety	Mild Anxiety	Moderate Anxiety	Severe Anxiety	χ2	df	P
Medium	69 (27.71)	141 (56.63)	20 (8.03)	19 (7.63)			
High	6 (85.71)	0 (0.00)	0 (0.00)	1 (14.29)			
Residence					5.39	3	.146
Urban	75 (25.42)	143 (48.47)	24 (8.14)	53 (17.97)			
Rural	8 (40.00)	5 (25.00)	1 (5.00)	6 (30.00)			
Gravidity					19.63	6	.003
1	0 (0.00)	21 (67.74)	6 (19.35)	4 (12.90)			
2–3	45 (27.95)	75 (46.58)	12 (7.45)	29 (18.01)			
≥ 4	38 (30.89)	52 (42.28)	7 (5.69)	26 (21.14)			
Parity					146.46	6	< .001
0	18 (10.40)	130 (75.14)	16 (9.25)	9 (5.20)			
1–2	32 (53.33)	8 (13.33)	4 (6.67)	16 (26.67)			
≥ 3	33 (40.24)	10 (12.20)	5 (6.10)	34 (41.46)			
Pregnancy Planned					85.97	3	< .001
Yes	37 (17.29)	136 (63.55)	19 (8.88)	22 (10.28)			
No	46 (45.54)	12 (11.88)	6 (5.94)	37 (36.63)			
Pregnancy Complications					43.96	3	< .001
Yes	35 (60.34)	11 (18.97)	3 (5.17)	9 (15.52)			
No	48 (18.75)	137 (53.52)	22 (8.59)	49 (19.14)			
Often Feel Stressed					188.73	3	< .001

Variables	No Anxiety	Mild Anxiety	Moderate Anxiety	Severe Anxiety	χ2	df	P
Yes	18 (7.50)	144 (60.00)	24 (10.00)	54 (22.50)			
No	65 (87.84)	4 (5.41)	0 (0.00)	5 (6.76)			
Adequate Social Support					54.51	3	< .001
Yes	71 (26.69)	141 (53.01)	22 (8.27)	32 (12.03)			
No	12 (24.49)	7 (14.29)	3 (6.12)	27 (55.10)			

Table 3. Continued

GAD severity was significantly associated with age, marital status, education, occupation, monthly income, gravidity, parity, pregnancy planning, pregnancy complications, frequent stress, social support, family conflict, and history of mental illness (all p<.05, chi-square test). See Table 3. Moreover, Residence was not significantly associated with GAD severity (χ^2=5.39, df = 3, p=.146); given that 93.7% of participants were urban, this non-significant result should be interpreted as reflecting limited statistical power rather than evidence of no association.

Multivariable analysis

Table 4
Multivariable ordinal logistic regression of factors associated with GAD severity (N = 312)

Variable	AOR	95% CI	p
Age (ref: <20 years)			
20–29 years	1.48	0.34–6.40	.598
30–39 years	0.10	0.02–0.55	.008
≥40 years	0.02	0.002–0.26	.003
Marital status (ref: married)			
Divorced	0.58	0.15–2.27	.430
Widowed	0.81	0.07–9.66	.868
Education (ref: no formal education)			
Primary	0.39	0.11–1.43	.155
Secondary	0.97	0.19–4.93	.968
Tertiary	1.03	0.14–7.43	.980
Occupation (ref: unemployed)			
Housewife	0.18	0.05–0.65	.009
Employed	1.20	0.21–6.88	.834
Self-employed	1.09	0.20–6.05	.919
Monthly income (ref: low)			
Medium	0.16	0.05–0.56	.004
High	0.001	0.000–0.07	.002
Residence (ref: urban)			
Rural	0.32	0.05–1.84	.200
Often feels stressed (ref: yes)			
No	0.004	0.001–0.015	< .001
Adequate social support (ref: yes)			
No	6.85	2.37–19.82	< .001
Family conflict (ref: yes)			

Note. AOR = adjusted odds ratio; CI = confidence interval. Model fit: log-likelihood = − 226.61; LR χ^2 (24) = 304.26, p<.001; pseudo R^2 = .402.

Variable	AOR	95% CI	p
No	0.69	0.25–1.96	.488
History of mental illness (ref: yes)			
No	0.94	0.26–3.45	.930
Gravidity (ref: 1)			
2–3	0.41	0.18–0.93	.034
≥4	0.30	0.12–0.75	.010
Parity (ref: 0)			
1–2	1.09	0.22–5.33	.914
≥3	15.33	3.07–76.49	.001
Pregnancy planned (ref: yes)			
No	0.46	0.17–1.19	.109
Pregnancy complications (ref: yes)			
No	2.47	0.85–7.20	.098

Note. AOR = adjusted odds ratio; CI = confidence interval. Model fit: log-likelihood = − 226.61; LR χ^2 (24) = 304.26, p<.001; pseudo R^2 = .402.

In the adjusted ordinal logistic regression model (Table 4; N = 312; LR $\chi^2(24) = 304.26$, p<.001; pseudo R^2=.402), seven variables remained independently associated with GAD severity. Compared with mothers aged below 20 years, those aged 30–39 years (AOR = 0.10, 95% CI 0.02–0.55, p=.008) and ≥ 40 years (AOR = 0.02, 95% CI 0.002–0.26, p=.003) had markedly lower odds of higher GAD severity. Compared with unemployed mothers, housewives had lower odds of higher GAD severity (AOR = 0.18, 95% CI 0.05–0.65, p=.009). Compared with low household income, medium (AOR = 0.16, 95% CI 0.05–0.56, p=.004) and high (AOR = 0.001, 95% CI 0.000–0.07, p=.002) income were both associated with substantially lower odds of higher GAD severity. Mothers who did not frequently feel stressed had markedly lower odds of higher GAD severity than those who did (AOR = 0.004, 95% CI 0.001–0.015, p<.001), while mothers without adequate social support had substantially higher odds of higher GAD severity than those with adequate support (AOR = 6.85, 95% CI 2.37–19.82, p<.001). Relative to a first pregnancy, higher gravidity was associated with lower odds of higher GAD severity (2–3 pregnancies: AOR = 0.41, 95% CI 0.18–0.93, p=.034; ≥4 pregnancies: AOR = 0.30, 95% CI 0.12–0.75, p=.010).see Table 4, In contrast, relative to no previous live births, parity of three or more was associated with markedly higher odds of higher GAD severity (AOR = 15.33, 95% CI 3.07–76.49, p=.001); parity of one to two births was not significant. Marital status, education, residence, family conflict, history of mental illness, pregnancy planning, and pregnancy complications were not independently associated with GAD severity after adjustment.

Table 5
Variance Inflation Factors for Predictor Variables

Variable	VIF	1/VIF
Parity	3.72	0.269
Age	3.48	0.287
Education	2.28	0.439
Income	2.22	0.450
Feelings of stress	2.03	0.493
Family conflict	2.02	0.496
Pregnancy planned	1.71	0.584
Occupation	1.44	0.692
Pregnancy status	1.44	0.692
Social support	1.40	0.715
Gravidity	1.27	0.787
Mental illness	1.20	0.837
Residence	1.19	0.838
Marital status	1.17	0.854
Mean VIF	**1.90**	

Before fitting the multivariable model, multicollinearity among candidate predictors was assessed using the variance inflation factor (VIF), which quantifies the degree to which the variance of a regression coefficient is inflated by linear association with other predictors in the model. As shown in Table 5, VIF values ranged from 1.17 (marital status) to 3.72 (parity), with a mean VIF of 1.90 across the fourteen candidate variables. All values fell well within the conventionally accepted threshold of 5, and substantially below the more permissive threshold of 10 sometimes applied in social science research, indicating that multicollinearity did not materially distort the coefficient estimates or standard errors in the adjusted model.

The two highest values, parity (VIF = 3.72) and age (VIF = 3.48), were expected given the biologically and socially patterned relationship between advancing maternal age and cumulative reproductive history; older mothers are, almost by definition, more likely to have had several previous births. Reassuringly, even these values remained far below the point at which shared variance would compromise the stability or interpretability of individual coefficients. This is methodologically important in light of the study's central finding: that age, gravidity, and parity exerted distinct, and in the case of gravidity and parity,

opposing, associations with GAD severity in the adjusted model (see Multivariable analysis). Had multicollinearity been substantial among these three variables, their individually estimated effects would have been unstable and difficult to interpret with confidence. The low VIF values obtained here therefore support the conclusion that the divergent effects of gravidity and parity reported in this study reflect genuine, independent associations rather than an artefact of shared variance between correlated reproductive history variables.

Discussion

This study found that GAD is highly prevalent among mothers attending MCH centres in Hargeisa, with 73.7% of mothers reporting at least mild symptoms and 26.6% reporting moderate-to-severe symptoms. Seven factors, spanning socio-economic, psychological, and obstetric domains, remained independently associated with GAD severity after adjustment: younger maternal age, unemployment, low household income, frequent stress, inadequate social support, lower gravidity, and, most strikingly, high parity.

The overall burden identified here sits at the higher end of the regional range. It exceeds estimates from Uganda (13%) (5) and several Ethiopian studies (23–32%) (6, 7), is broadly comparable to the pooled East African antenatal estimate (29%) (9) and to Bishaw et al.'s COVID-era Ethiopian estimate (43.7%) (8), and is substantially higher than the combined mild-to-severe burden reported among postpartum women in Spain (47.3%) (4). Evidence from Sudan and Egypt, though using different instruments, similarly points to a heavy regional burden of perinatal anxiety and depression (11, 12), consistent with the interpretation that political instability, weak formal mental health infrastructure, and socio-economic adversity across the Horn of Africa may combine to elevate maternal psychological vulnerability beyond what is typical in higher-resource settings.

The protective effect of older maternal age is consistent with evidence from Malawi, where adolescent mothers aged 19 years or younger showed markedly elevated anxiety risk (13), and plausibly reflects the more limited coping resources, curtailed education, and greater dependency associated with very young motherhood. The protective effects of housewife status (relative to unemployment) and of medium-to-high household income parallel findings from a Spanish postpartum cohort in which higher income was independently protective against anxiety (4), and are consistent with broader evidence that low socio-economic status amplifies the psychological impact of adverse life events during the perinatal period.

Stress and social support were the strongest psychological predictors, a pattern that closely mirrors the protective role of social support documented among adolescent mothers in Malawi (13)and is consistent with the wider literature on informal support networks buffering perinatal distress. This finding has a direct, low-cost implication: peer-support or group counselling models delivered within existing MCH infrastructure could plausibly reduce anxiety burden without requiring specialist mental health staffing, which remains scarce in Somaliland.

The most distinctive finding is the divergence between gravidity and parity. Higher gravidity was protective, consistent with the interpretation that repeated exposure to pregnancy reduces uncertainty-

driven anxiety, and echoing findings from Ethiopia where primigravidity independently raised anxiety risk (6, 13)Notably, however, this pattern runs in the opposite direction to Kassaw and Pandey's Dilla, Ethiopia study, in which primigravida status itself (rather than low parity) was the risk factor (7). In the present study, it was specifically high parity, three or more previous births, that carried the greatest risk (AOR = 15.33), independent of gravidity. This suggests that in this setting it is not pregnancy or childbirth experience per se that drives chronic maternal anxiety, but the cumulative caregiving and economic burden of already raising several children. This distinction is rarely made explicit in comparable African studies, which typically treat reproductive history as a single composite variable, and represents this study's principal contribution to the regional evidence base. Given the very wide confidence interval around this estimate, however, it should be treated as an important hypothesis-generating signal warranting replication in a larger sample rather than a precise effect size (see Strengths and Limitations).

These findings should not be interpreted causally, given the cross-sectional design. Nonetheless, they carry direct implications for maternal healthcare in Somaliland: they suggest that anxiety screening and support at MCH centres should not be targeted solely at first-time or medically high-risk pregnancies, but should also proactively include mothers with several previous children, a group that may otherwise be overlooked by conventional obstetric risk stratification.

Strengths and Limitations

This is, to our knowledge, the first study to report on maternal GAD among MCH attendees in Somaliland, using a validated instrument with excellent internal consistency in this sample (GAD-7 α = .95), a probability-based stratified and systematic sampling design across four centres, and a multivariable model that distinguishes independent predictors from confounded bivariate associations. A total of 315 mothers were enrolled; 312 were included in the final multivariable model after exclusion of cases with incomplete data. Its disaggregation of gravidity and parity, rarely reported separately in comparable literature, is a further methodological strength.

Several limitations should be considered. The cross-sectional design precludes causal inference. Reliance on self-report raises the possibility of social-desirability and recall bias, particularly for sensitive items such as stress, family conflict, and mental illness history. Residence was highly imbalanced (93.7% urban), limiting statistical power to detect a genuine rural–urban difference; the non-significant residence finding should not be interpreted as evidence of no association. Several regression estimates, most notably for high income (AOR = 0.001) and high parity (AOR = 15.33), had extremely wide confidence intervals consistent with small cell sizes in these subgroups, raising the possibility of small-sample instability; these estimates are best interpreted as indicative rather than precise and would benefit from replication in a larger sample, ideally using penalised (Firth) regressions. Finally, detailed eligibility criteria and a comparison of responders versus non-responders were not available, limiting assessment of potential selection bias.

Conclusion

Maternal GAD is common among mothers attending MCH centres in Hargeisa, Somaliland, with nearly three-quarters of mothers reporting at least mild symptoms. GAD severity was independently associated with younger maternal age, unemployment, low household income, frequent stress, inadequate social support, and, most strikingly, high parity, while higher gravidity was protective. These findings suggest that maternal GAD in this setting reflects an interacting burden of socio-economic disadvantage, psychosocial strain, and cumulative reproductive and caregiving demands rather than any single determinant. Integrating brief, validated anxiety screening into routine antenatal and postnatal care, with particular attention to young, low-income, and high-parity mothers, and strengthening informal social support structures, may help address this substantial and currently unaddressed burden.

Declarations

ETHICAL APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was granted by the Institutional Review Board of Frantz Fanon University in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. Written informed consent was obtained from all individual participants included in the study

CONSENT FOR PUBLICATION

Not applicable. (No individual person's data, videos, or identifying images are included in this study).

HUMAN ETHICS AND CONSENT TO PARTICIPATE DECLARATIONS

Applicable. Ethical approval and written informed consent were secured as detailed above.

CLINICAL TRIAL NUMBER

Clinical trial number: Not applicable.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTION

Egal Jama Guled (EJG): Conceptualization, Methodology, Software, Formal analysis, Writing – original draft.

Mohamed Farah Handule (MFH): Project administration and supervision, Methodology, Writing – review & editing.

Abdirashid Muhumed Guled (AMG): Investigation, Resources.

Mohamed Abdilahi Mohamed (MAM): Data curation, Validation.

FUNDING

This research was conducted without any external funding support.

Author Contribution

Egal Jama Guled (EJG): Conceptualization, Methodology, Software, Formal analysis, Writing – original draft.Mohamed Farah Handule (MFH): Project administration and supervision, Methodology, Writing – review & editing. Abdirashid Muhumed Guled (AMG): Investigation, Resources. Mohamed Abdilahi Mohamed (MAM): Data curation, Validation.

Acknowledgement

We sincerely appreciate all the women who took part in this study and contributed their valuable insights.

Data Availability

The data supporting the findings of this study are available from the authors upon reasonable request.

References

1. DeMartini J, Patel G, Fancher TL. Generalized anxiety disorder. Ann Intern Med. 2019;170(7):ITC49–64.
2. Fawcett EJ, Fairbrother N, Cox ML, White IR, Fawcett JM. The prevalence of anxiety disorders during pregnancy and the postpartum period: a multivariate Bayesian meta-analysis. J Clin Psychiatry. 2019;80(4):18r12527.
3. Rose MS, Pana G, Premji S. Prenatal maternal anxiety as a risk factor for preterm birth and the effects of heterogeneity on this relationship: a systematic review and meta-analysis. Biomed Res Int. 2016;2016(1):8312158.
4. Ogallar MAD, Vázquez SM, Martínez AH, Molina RAP, Galiano JMM. Prevalence and associated factors of anxiety in postpartum women. Eur J Midwifery. 2025;9. 10.18332/ejm/204308.

5. Nabwire M, Nakimuli A, Nakasujja N, Migisha R, Kiggundu C. Prevalence and factors associated with anxiety disorders among pregnant women at Mulago National Referral Hospital, Uganda. Int J women's health. 2024:237–47.
6. Pandey D. The prevalence of general anxiety disorder and its associated factors among women attending the perinatal service of Dilla University referral hospital, Ethiopia during the COVID-19 pandemic. Heliyon. 2020;6(11).
7. Bishaw KA, Andalem A, Amha H, Wondie T. Generalized anxiety disorder and its associated factors among pregnant women during COVID-19 at public health facilities of East Gojjam Zone, 2020: a multi-center cross-sectional study. Front Global Women's Health. 2022;3:918332.
8. Desalegn SY, Feleke AE, Germame BF, Samuel AW. Prevalence of anxiety and associated factors among pregnant women in East Africa: A systematic review and meta-analysis, 2023. Public Health. 2025;244:105759.
9. Roddy Mitchell A, Gordon H, Atkinson J, Lindquist A, Walker SP, Middleton A, et al. Prevalence of perinatal anxiety and related disorders in low-and middle-income countries: a systematic review and meta-analysis. JAMA Netw open. 2023;6(11):e2343711.
10. Osman AH, Hagar TY, Osman AA, Suliaman H. Prevalence of depression and anxiety disorders in peri-natal Sudanese women and associated risks factors. Open J Psychiatry. 2015;5(342):104236.
11. Abdelhai R, Mosleh H. Screening for antepartum anxiety and depression and their association with domestic violence among Egyptian pregnant women. J Egypt Public Health Assoc. 2015;90(3):101–8.
12. Tembo C, Portsmouth L, Burns S. Cultural and social factors associated with generalized anxiety disorder among adolescent mothers during the postpartum period in Malawi: a cross-sectional survey. BMC Global Public Health. 2024;2(1):50.
13. Robert L, Spitzer MKK, Janet MD, Williams BW. DSW A Brief Measure for Assessing Generalized Anxiety Disorder.
14. The GAD-7. Arch Intern Med. 2006.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryFileStudyQuestionnaire.docx