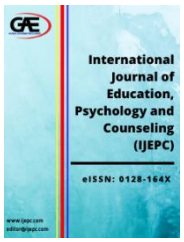
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PSYCHOLOGICAL DISTRESS AND RESILIENCE AMONG WOMEN WITH RECURRENT MISCARRIAGE IN LAGOS STATE, NIGERIA

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Abstract:

Recurrent miscarriage is associated with substantial psychological burden, yet little is known about its association with resilience among women in Nigeria. This study examined levels of depression, anxiety and stress among women with recurrent miscarriage in Lagos State, Nigeria, and whether resilience was associated with these outcomes. A cross-sectional survey was completed by 200 women aged 18 to 50 years with a history of two or more miscarriages, recruited through five healthcare facilities and online maternal health platforms. Depression, anxiety and stress were measured using the Depression Anxiety Stress Scale (DASS-21), and resilience using the Connor-Davidson Resilience Scale (CD-RISC-10). Hierarchical linear regression examined associations between resilience and each distress outcome, controlling for sociodemographic and reproductive history variables. Levels of distress were high, with 86.5% of participants reporting at least mild depression, 89.0% at least mild anxiety and 60.0% at least mild stress. Higher resilience was significantly associated with lower depression (β = -.371), anxiety (β = -.371) and stress (β = -.432, all $p < .001$), explaining additional variance beyond sociodemographic factors alone (ΔR^2 = .144 to .179). These findings indicate that resilience is a consistent and clinically meaningful correlate of lower psychological distress among Nigerian women with recurrent miscarriage, suggesting the potential value of developing resilience-focused psychosocial interventions within reproductive healthcare services in Nigeria.

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Introduction

In line with ASRM and ESHRE guidelines, a woman is considered to have experienced recurrent miscarriage once she has had two or more pregnancy losses and it affects an estimated 2–5% of women worldwide (American Society for Reproductive Medicine, 2020; ESHRE Working Group on RPL, 2023; Eleje et al., 2023). Beyond its clinical significance, recurrent loss carries a psychological weight that extends well past the event itself, yet much of the evidence documenting this burden originates from European and Asian settings whose social structures, healthcare systems and cultural expectations differ markedly from those found in sub-Saharan Africa.

Very few studies have examined resilience specifically among women with recurrent miscarriage, and evidence from this region remains close to non-existent. Understanding resilience in this population is important because focusing only on psychological distress may overlook differences in how women cope with recurrent miscarriage. Examining resilience may therefore help identify factors associated with better coping and inform more targeted psychological support. This study addresses that gap by examining levels of depression, anxiety and stress among women with recurrent miscarriage in Lagos State, Nigeria, and by testing whether resilience is associated with these outcomes after accounting for sociodemographic characteristics. Without such evidence, healthcare providers in Lagos State may have limited local information for identifying women experiencing greater psychological distress and for planning appropriate psychological support.

The objective of this study was therefore twofold: to examine levels of depression, anxiety and stress among women with recurrent miscarriage in Lagos State, Nigeria, and to determine whether resilience was associated with these outcomes after accounting for sociodemographic characteristics.

Literature Review

Psychological Distress Following Recurrent Miscarriage

That women with recurrent miscarriage experience heightened depression, anxiety and stress is among the more consistent findings in this field, documented across a wide range of settings and study designs (Farren et al., 2018; Qu et al., 2021). It is known that this distress happens,

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but it is not really known how common or severe it is, whether it changes over time, or whether what's been found in European and Asian studies even applies to African women.

Pooling 29 studies and over 35,000 women, Shetty et al. (2025) offer the most thorough attempt yet to put numbers on this: roughly 30% for depression, 33% for anxiety, 34% for stress. One limitation stands out. Single pregnancy loss and recurrent loss were grouped together in this review, despite being different experiences. Repeated loss, ongoing uncertainty about future pregnancies, prolonged medical investigation for some women recurrent miscarriage carries all of this. Merged into one category, the psychological burden specific to recurrent loss risks being underestimated.

A messier picture emerges from individual studies. Depression rates span from under 30% to over 75%. Wang et al. (2021) and Qu et al. (2021) sit toward the lower end. Koly et al. (2023), reporting the highest figure, sampled women in urban slums in Bangladesh, where poverty and limited healthcare access are the norm. Measurement differences alone struggle to explain a gap this wide. Context, it seems, plays a role too. Nigeria may be no exception. Similar social pressures, similar gaps in psychological support, possibly higher distress than wealthier settings would suggest.

Two studies give more direct evidence by comparing women with recurrent miscarriage against women without this history. Issakhanova et al. (2023) compared 70 women with recurrent miscarriage against 78 controls in Kazakhstan; Eleje et al. (2023) compared 47 Nigerian women with recurrent miscarriage against 94 without. Both used DASS-21, and both found significantly higher depression, anxiety and stress in the recurrent-loss groups. Eleje et al. (2023) also found that the three outcomes did not show the same pattern, and stress carried the strongest link to poor pregnancy outcomes overall, which argues for measuring depression, anxiety and stress separately rather than treating them as one thing. Both studies drew from a single hospital and worked with fairly small samples, so it is possible the women recruited were more severely affected than the wider population of women with recurrent loss.

Longitudinal evidence is scarce. Qu et al. (2021) followed 166 women through a subsequent pregnancy and found anxiety easing from 47.6% early on to 32.5% later, with depression falling from 38% to 31% over the same period. A single clinical centre, and a focus on distress during a later pregnancy rather than the period right after loss, limits how far that pattern can be extended. Shen et al. (2024) tracked almost 218,900 women in the UK Biobank for a median of thirteen years. Women with two or more miscarriages carried a meaningfully higher risk of developing a common mental disorder. The sample size is a clear strength. Yet UK Biobank participants tend to be older, more educated and healthier than the general population. How well this finding applies to Nigerian women is far from clear.

Social and Cognitive Factors Shaping Distress

What keeps distress going over time, beyond how common it is, is the focus of several accounts. Intrusive thoughts, guilt and self-blame can form a self-sustaining cycle, Tian and Solomon (2020) suggested that intrusive thoughts, guilt and self-blame can reinforce one another, and this cycle may extend grief well beyond the loss itself. This aligns with appraisal-based models of coping, which hold that a person's interpretation of an event, rather than the event alone, shapes how well they adapt to it. Women who interpret miscarriage as a personal failure may therefore find it harder to adjust.

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Social conditions is another factor, particularly in Nigeria. Gbaranor et al. (2025) studied 250 married women across South-South Nigeria, finding that 76% reported depressive symptoms and 60% reported stress, often alongside harassment from in-laws and tension at home. Cross-sectional in design, the study cannot establish whether social strain or distress came first. Even so, the findings point to how closely psychological distress is tied to a woman's social world after recurrent miscarriage. Stigma, blame and family pressure may all play a part, in ways Western clinical literature may not fully capture.

A similar story comes from a large mixed-methods study in Northern Ireland. Women with two or more losses reported significantly more distress than those with one, Aventin et al. (2025) found. Persistent grief, fear of future loss and isolation featured throughout the interviews. One detail complicates direct comparison with the rest of this literature: a miscarriage-specific distress measure was used rather than the DASS-21. Depression, anxiety and grief after recurrent miscarriage become severe enough to disrupt daily functioning for some women, Białek and Malmur (2020) add. Elsharkawy et al. (2021), by contrast, reported reductions in DASS-21 scores among women who completed a counselling programme after recurrent miscarriage.

Resilience as a Protective Resource

A different question has drawn far less attention. Why do some women keep functioning reasonably well despite repeated loss, while others struggle more, and for longer? Part of the answer lies in resilience, broadly understood as the capacity to adapt and keep functioning under adversity (Connor & Davidson, 2003).

Hajure et al. (2024) offer the most complete evidence linking resilience to psychological outcomes in perinatal populations. Higher resilience was consistently linked to lower psychological distress in their systematic review, likely through mechanisms such as positive reappraisal, self-esteem and tolerance of uncertainty. Most of the included studies came from high-income countries, though, and examined perinatal populations broadly rather than recurrent miscarriage specifically. Applying this conclusion directly to the present population therefore needs some caution.

Qualitative research pushes back on the idea that being resilient just means not being distressed. Chen et al. (2025) interviewed Chinese women who had gotten pregnant again after previous losses, and many of them described feeling both resilient and afraid at once, strong enough to keep going but still anxious about losing this pregnancy too. This suggests resilience isn't a fixed personality trait some women have and others don't, but something that shifts and changes over time.

Resilience also appears to be something that can be built. A six-session resilience training programme improved both resilience and mental health scores in a randomised trial of 66 women with unwanted pregnancies, with gains still present at one month follow-up (Naderpour et al., 2024). Unwanted pregnancy differs enough from recurrent miscarriage that this finding should be applied carefully. Higher baseline resilience was linked to better quality of life among women facing fertility difficulties in a related study, easing the link between infertility-related stress and wellbeing (Li et al., 2019).

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Two limitations run through this literature. The first is that it leans heavily on the individual. Structural conditions, healthcare quality, financial security, social support, can be missed when personal psychological traits are the focus, yet these are what determine whether a woman is even in a position to respond adaptively in the first place. What poverty, stigma or poor healthcare access do to a person is not erased by personal resilience. The second limitation concerns cultural transferability.

Western populations produced most resilience research, including the development of the Connor-Davidson Resilience Scale and its shortened CD-RISC-10 form used here. Whether Western ideas of adaptation and coping map cleanly onto how resilience is lived and understood in Nigerian communities, where faith, family obligation and collective identity carry particular weight, is not obvious. Practical reasons still justified choosing the CD-RISC-10 for this study: it has held up well across diverse populations including Nigerian samples (Aloba et al., 2016), it has a track record in reproductive health research, and its brevity keeps the burden on participants low.

Together the evidence indicates that recurrent miscarriage is associated with substantial psychological distress and that resilience may be an important factor associated with better psychological outcomes. Almost none of it, though, has looked at resilience specifically among women with recurrent miscarriage, and evidence from Nigeria is close to non-existent. This study fills part of that gap by examining whether CD-RISC-10 resilience scores relate to DASS-21 depression, anxiety and stress scores among women with recurrent miscarriage in Lagos State, Nigeria.

Methodology

Design and Setting

This study used a quantitative cross-sectional survey design, conducted in Lagos State, Nigeria. Lagos is Nigeria's most populous and diverse state and combines a high burden of reproductive health challenges with well-documented barriers to psychological support (Matsuoka et al., 2020), making it a relevant and previously unstudied setting for this research.

Participants and Sampling

Participants were women aged 18 to 50 years with a history of two or more miscarriages, consistent with ASRM and ESHRE criteria (American Society for Reproductive Medicine, 2020; ESHRE Working Group on RPL, 2023), currently residing in Lagos State and able to read and understand English. Women who had a current diagnosis of a severe mental health condition or were currently receiving inpatient or intensive outpatient psychiatric treatment were excluded.

The 18 to 50 age range selected in this study was chosen to cover the years in which pregnancy and pregnancy loss are clinically relevant. Eighteen marks the age of majority, so women can consent independently. Fifty years of age reflects the average age of natural menopause among Nigerian women (Ikeanyi & Ikobho, 2021). This range also matches what comparable studies in this area have used (Shetty et al., 2025; Eleje et al., 2023; Issakhanova et al., 2023).

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Lagos State does not have a population registry for women with recurrent miscarriage. Because of this, a non-probability purposive sample was recruited through five healthcare facilities and online maternal health support networks. A total of 259 questionnaires were collected. A final sample of 200 participants was retained after incomplete or unreliable responses were excluded. This sample was more than adequate for detecting medium-sized effects in the planned regression models, according to an a priori power analysis using G*Power.

Measures

Depression, anxiety and stress were measured using the Depression Anxiety Stress Scale (DASS-21) (Lovibond & Lovibond, 1995). This is a 21-item self-report instrument that yields three subscale scores ranging from 0 to 42, with higher scores indicating greater symptom severity. Resilience was measured using the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) (Campbell-Sills & Stein, 2007), with total scores ranging from 0 to 40. Good reliability has been shown for both instruments in Nigerian samples (Coker et al., 2018; Aloba et al., 2016). Standard response options and scoring procedures were kept for both, though a brief contextual reference to recurrent miscarriage was added to some items, allowing participants to apply the questions specifically to their experience of pregnancy loss.

Reliability was checked again within the present sample using Cronbach's alpha. It came out good to accept across all subscales (Depression $\alpha = .84$, Anxiety $\alpha = .81$, Stress $\alpha = .79$, Resilience $\alpha = .83$). The reliability coefficients for the adapted versions, assessed within this sample, closely matched those reported for the original instruments in earlier Nigerian validation studies, which offers some indirect support for their comparability.

Sociodemographic characteristics (age, marital status, educational level, employment status and household income) and reproductive history (time since the most recent miscarriage) were collected using a researcher-developed questionnaire and entered as covariates in the regression analyses reported below.

Data Collection Procedure

Data was collected between August 2025 and October 2025, using both paper-based and online questionnaires. Eligible women recruited in participating healthcare facilities completed the questionnaire during clinic visits after providing written informed consent. For online recruitment, eligible participants accessed the same questionnaire via a secure Google Forms link shared through maternal health support networks and provided electronic consent before completion. The paper-based and online questionnaires were identical in content and structure.

Data Analysis

Data was analysed using SPSS Statistics Version 27.0. Descriptive statistics were used to summarise levels of depression, anxiety and stress. To examine the association between resilience and each distress outcome, hierarchical linear regression was used. Sociodemographic characteristics and time since the most recent miscarriage were entered in Block 1. CD-RISC-10 resilience was then entered in Block 2. Normality, multicollinearity and independence of errors were checked across all models, and all assumptions were met. Effect sizes (β, ΔR^2) and 95% confidence intervals were reported alongside p values, with all tests two-tailed and significance set at $p < .05$.

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Rather than as a statistical moderator, resilience was treated as a direct correlate of psychological distress. This fits the study's cross-sectional design and its main aim, which was to establish whether an association exists rather than to test the specific mechanism through which resilience might operate.

Result

Sample Characteristics

Most women from the retained 200 were aged 26 to 35 years (39.0%), married (52.0%) and had completed tertiary education (74.0%). Two miscarriages had been experienced by most participants (69.0%), and just over half (53.0%) had experienced their most recent miscarriage within the preceding 6 to 12 months (Table 1).

Table 1. Sociodemographic and Reproductive History Characteristics of Participants (n = 200)

Variable	Category	n (%)
Age (years)	18–25	48 (24.0)
	26–35	78 (39.0)
	36–45	48 (24.0)
	46–50	26 (13.0)
Marital status	Single	72 (36.0)
	Married	104 (52.0)
	Divorced	24 (12.0)
Employment status	Full-time	68 (34.0)
	Part-time	52 (26.0)
	Self-employed	42 (21.0)
	Unemployed/Student	38 (19.0)
Educational level	No formal education	2 (1.0)
	Primary education	6 (3.0)
	Secondary education	44 (22.0)
	Tertiary education	148 (74.0)
Monthly household income	₦25,000–₦50,000	58 (29.0)
	₦51,000–₦80,000	62 (31.0)
	₦81,000–₦100,000	52 (26.0)
	Above ₦100,000	28 (14.0)
Number of miscarriages	Two	138 (69.0)

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	Three	50 (25.0)
	Four or more	12 (6.0)
Time since most recent miscarriage	<6 months	20 (10.0)
	6–12 months	106 (53.0)
	1–3 years	50 (25.0)
	3–5 years	18 (9.0)
	>5 years	6 (3.0)

Table 2. Descriptive Statistics and Severity Distribution for DASS-21 Subscales (n = 200)

Subscale	Mean (SD)	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	Extremely Severe n (%)
Depression	18.64 (8.72)	27 (13.5)	26 (13.0)	88 (44.0)	33 (16.5)	26 (13.0)
Anxiety	20.36 (9.18)	22 (11.0)	6 (3.0)	60 (30.0)	32 (16.0)	80 (40.0)
Stress	17.82 (8.95)	80 (40.0)	44 (22.0)	36 (18.0)	26 (13.0)	14 (7.0)

Note. DASS-21 subscale scores range from 0 to 42, with higher scores indicating greater symptom severity. Severity categories are based on the cut-off scores recommended by Lovibond and Lovibond (1995).

As shown in Table 2, psychological distress was common across all three DASS-21 subscales. Overall, 86.5% of participants reported at least mild depressive symptoms, 89.0% reported at least mild anxiety symptoms and 60.0% reported at least mild stress. Anxiety showed the greatest severity, with 40.0% of participants scoring within the extremely severe range.

Hierarchical linear regression analyses were conducted separately for depression, anxiety and stress. In Block 1, the sociodemographic and reproductive history variables together accounted for a modest but statistically significant share of variance in each outcome (Table 3). Adding resilience in Block 2 produced a substantial increase in explained variance for all three outcomes: $\Delta R^2 = .144$ for depression, $\Delta F(1, 192) = 36.22$, $p < .001$; $\Delta R^2 = .149$ for anxiety, $\Delta F(1, 192) = 38.18$, $p < .001$; and $\Delta R^2 = .179$ for stress, $\Delta F(1, 192) = 48.28$, $p < .001$. In practical terms, resilience accounted for an additional 14.4% to 17.9% of the variance in depression, anxiety and stress scores beyond that already explained by sociodemographic and reproductive history variables.

Table 3. Hierarchical Regression Model Summary for Depression, Anxiety and Stress (n = 200)

Outcome	Block	R	R^2	Adj. R^2	F	p	ΔR^2	ΔF	Δp
Depression	1	.32	.10	.06	2.37	.014	—	—	—
2: + Resilience	.49	.24	.21	6.01	<.001	.14	34.56	<.001	

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Anxiety	1	.33	.11	.06	2.50	.010	—	—	—
2: + Resilience	.51	.26	.22	6.50	<.001	.15	38.11	<.001	
Stress	1	.33	.11	.07	2.64	.007	—	—	—
2: + Resilience	.54	.30	.26	7.95	<.001	.18	49.46	<.001	

Block 1 contains 9 predictors: age, education, income, time since miscarriage, married vs. single dummy, divorced vs. single dummy, part-time vs. full-time dummy, self-employed vs. full-time dummy, unemployed vs. full-time dummy. Block 2 adds CD-RISC-10 resilience.

Hierarchical multiple regression analyses were conducted separately for depression, anxiety, and stress. Sociodemographic variables were entered in Block 1, and CD-RISC-10 resilience total score was added in Block 2. Block 1 explained a modest but significant share of variance in each outcome. Adding resilience in Block 2 produced substantial increases in explained variance: $\Delta R^2 = .139$ for depression ($\Delta F = 34.56$), .150 for anxiety ($\Delta F = 38.11$), and .184 for stress ($\Delta F = 49.46$), all $p < .001$ (Table 3).

Table 4. Regression Coefficients for Depression (Block 2, n = 200)

Predictor	B	SE	β	t	p	95% CI
(Constant)	28.84	5.94	–	4.86	< .001	[17.19, 40.49]
Age	0.82	0.84	.069	0.98	.329	[−0.83, 2.47]
Married vs. single	1.84	1.58	.105	1.16	.247	[−1.26, 4.94]
Divorced vs. single	6.42	2.14	.239	3.00	.003	[2.23, 10.61]
Part-time vs. full-time	0.86	1.44	.043	0.60	.550	[−1.96, 3.68]
Self-employed vs. full-time	1.24	1.52	.058	0.82	.415	[−1.74, 4.22]
Unemployed vs. full-time	2.84	1.62	.128	1.75	.082	[−0.34, 6.02]
Educational level	−0.86	1.12	−.056	−0.77	.443	[−3.07, 1.35]
Income level	−0.44	0.82	−.038	−0.54	.591	[−2.06, 1.18]
Time since miscarriage	−1.24	0.68	−.131	−1.82	.070	[−2.59, 0.11]
Resilience (CD-RISC-10)	−0.412	0.068	−.371	−6.02	< .001	[−0.547, −0.277]

Note:. B = unstandardised coefficient; SE = standard error; β = standardised coefficient; CI = confidence interval. Marital status was dummy-coded with single women as the reference category (Married_D = 1 if married, 0 if

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single; Divorced_D = 1 if divorced, 0 if single). Employment status was dummy-coded with full-time workers as the reference category (PartTime_D = 1 if part-time, 0 if full-time; SelfEmp_D = 1 if self-employed, 0 if full-time; Unemployed_D = 1 if unemployed, 0 if full-time). Block 1 included 9 predictors: age, Married_D, Divorced_D, PartTime_D, SelfEmp_D, Unemployed_D, educational level, income level, and time since miscarriage. Block 2 added CD-RISC-10 resilience (10 predictors total). VIF values across all predictors ranged from 1.04 to 2.18, and Durbin–Watson statistics ranged from 1.78 to 2.14 across all models, indicating no problematic multicollinearity and acceptable independence of errors.

Table 5. Regression Coefficients for Anxiety (Block 2, n = 200)

Predictor	B	SE	β	t	p	95% CI
(Constant)	30.64	6.24	–	4.91	< .001	[18.41, 42.87]
Age	1.04	0.88	.083	1.18	.239	[−0.69, 2.77]
Married vs. single	0.82	1.64	.045	0.50	.618	[−2.39, 4.03]
Divorced vs. single	2.96	2.22	.105	1.33	.185	[−1.39, 7.31]
Part-time vs. full-time	0.48	1.50	.023	0.32	.750	[−2.46, 3.42]
Self-employed vs. full-time	0.64	1.58	.028	0.41	.685	[−2.46, 3.74]
Unemployed vs. full-time	2.42	1.68	.103	1.44	.151	[−0.87, 5.71]
Educational level	−0.72	1.18	−.044	−0.61	.542	[−3.04, 1.60]
Income level	−0.56	0.86	−.045	−0.65	.516	[−2.25, 1.13]
Time since miscarriage	−1.08	0.72	−.107	−1.50	.136	[−2.50, 0.34]
Resilience (CD-RISC-10)	−0.434	0.072	−.374	−6.03	< .001	[−0.576, −0.292]

Note: B = unstandardised coefficient; SE = standard error; β = standardised coefficient; CI = confidence interval. Marital status was dummy-coded with single women as the reference category (Married_D = 1 if married, 0 if single; Divorced_D = 1 if divorced, 0 if single). Employment status was dummy-coded with full-time workers as the reference category (PartTime_D = 1 if part-time, 0 if full-time; SelfEmp_D = 1 if self-employed, 0 if full-time; Unemployed_D = 1 if unemployed, 0 if full-time). Block 1 included 9 predictors: age, Married_D, Divorced_D, PartTime_D, SelfEmp_D, Unemployed_D, educational level, income level, and time since miscarriage. Block 2 added CD-RISC-10 resilience (10 predictors total). VIF values across all predictors ranged from 1.04 to 2.18, and Durbin–Watson statistics ranged from 1.78 to 2.14 across all models, indicating no problematic multicollinearity and acceptable independence of errors.

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Table 6. Regression Coefficients for Stress (Block 2, n = 200)

Predictor	B	SE	β	t	p	95% CI
(Constant)	27.24	5.82	–	4.68	< .001	[15.83, 38.65]
Age	0.76	0.86	.062	0.88	.378	[−0.93, 2.45]
Married vs. single	0.96	1.60	.054	0.60	.549	[−2.18, 4.10]
Divorced vs. single	2.88	2.18	.105	1.32	.188	[−1.39, 7.15]
Part-time vs. full-time	0.42	1.48	.021	0.28	.779	[−2.48, 3.32]
Self-employed vs. full-time	0.68	1.56	.031	0.44	.662	[−2.38, 3.74]
Unemployed vs. full-time	1.94	1.64	.085	1.18	.239	[−1.28, 5.16]
Educational level	−0.96	1.14	−.061	−0.84	.401	[−3.21, 1.29]
Income level	−0.52	0.84	−.044	−0.62	.537	[−2.17, 1.13]
Time since miscarriage	−1.44	0.70	−.149	−2.06	.041	[−2.82, −0.06]
Resilience (CD-RISC-10)	−0.498	0.072	−.432	−6.95	< .001	[−0.640, −0.356]

Note:. B = unstandardised coefficient; SE = standard error; β = standardised coefficient; CI = confidence interval. Marital status was dummy-coded with single women as the reference category (Married_D = 1 if married, 0 if single; Divorced_D = 1 if divorced, 0 if single). Employment status was dummy-coded with full-time workers as the reference category (PartTime_D = 1 if part-time, 0 if full-time; SelfEmp_D = 1 if self-employed, 0 if full-time; Unemployed_D = 1 if unemployed, 0 if full-time). Block 1 included 9 predictors: age, Married_D, Divorced_D, PartTime_D, SelfEmp_D, Unemployed_D, educational level, income level, and time since miscarriage. Block 2 added CD-RISC-10 resilience (10 predictors total). VIF values across all predictors ranged from 1.04 to 2.18, and Durbin–Watson statistics ranged from 1.78 to 2.14 across all models, indicating no problematic multicollinearity and acceptable independence of errors.

Discussion

According to the findings of this study, a high level of psychological distress was found among women with recurrent miscarriage in Lagos State. Most of the women in the study had at least mild depression and anxiety symptoms, and for a lot of them, the anxiety was quite severe. This tells that emotional distress after recurrent miscarriage isn't minor in this group. It's affecting a large share of the women who took part.

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How prevalence is defined matters when comparing these findings with other studies. Some studies report rates based on clinical diagnoses or "moderate and above" symptom levels, while this study reported the proportion with at least mild symptoms on the DASS-21. Even with that caution, the level of distress in this sample still appears high. A recent meta-analysis (Shetty et al., 2025), for example, reported prevalence estimates around 30% for depression and 33% for anxiety, figures much lower than what was found here. Even restricting the present sample to participants with moderate-to-extremely-severe symptoms, the proportions remain high (73.5% for depression and 86.0% for anxiety).

The depression results also appear higher than what has been reported among Nigerian women with recurrent miscarriage in another study by Akwuruoha et al., 2025, which means the psychological burden in this Lagos-based sample may be high even compared with other Nigerian settings. A few things could explain this. Repeated pregnancy loss may simply wear women down over time. Each cycle of hope, loss, fear and uncertainty adds to the last, and coping resources may not fully recover between losses. Also, social and structural issues that shape women's experiences in Nigeria may be another factor, including stigma and blame, limited access to formal psychological support, and strong cultural expectations around motherhood (Gbaranor et al., 2025). Recruitment may also have part to play. A good number of participants were recruited through hospital-based reproductive health services. Women attending specialist services may have more complicated histories or may seek help because they are already struggling, so symptom levels could be higher than what we might find in a community sample. Similar patterns have been noted in other studies (Kicia et al., 2021). This remains an assumption, though, since distress levels by recruitment source were not directly compared in the current study. Future research could test this more clearly.

Lower depression, anxiety and stress scores were consistently linked with resilience, after controlling for sociodemographic variables. This fits with other research linking resilience to better mental health outcomes more broadly (Hajure et al., 2024). Women who reported stronger resilience tended to report fewer distress symptoms, even alongside repeated pregnancy loss. Stress showed the strongest link with resilience, slightly ahead of depression and anxiety. Lazarus and Folkman's (1984) coping model fits this pattern, suggesting resilience may help women manage day-to-day pressure and keep functioning even when the future feels uncertain. Resilience, in that sense, might not remove sadness or worry completely, but may reduce feeling overwhelmed and unable to cope. That said, this interpretation should be taken cautiously. Being cross-sectional and correlational, the study cannot confirm the mechanism. Testing that kind of process properly would require moderation or longitudinal analysis. Still, the pattern is in line with qualitative work suggesting that resilience after pregnancy loss can involve ongoing adaptation rather than the absence of distress (Chen et al., 2025).

In the regression models, most sociodemographic factors did not show independent associations with distress once resilience was included. Employment status and income were not significant predictors in the final models. One reason may be that this sample was relatively urban and highly educated, and the income categories may not have had enough spread to clearly detect differences. This does not mean economic conditions do not matter in Nigeria, but rather that this sample may have been too similar on these characteristics to show a strong effect.

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Two covariate findings do deserve attention in this study. First, divorced participants (compared with single participants had higher depression scores. This may reflect reduced social support, relationship stress, or additional stigma, but the current study cannot confirm the reason. Second, a longer time since the most recent miscarriage was linked with lower stress. This may suggest that stress symptoms reduce gradually over time, although the cross-sectional design means we cannot track individual change. These findings point to the possibility that some subgroups such as women who are more recently affected by miscarriage, and those experiencing relationship disruption may need more targeted attention.

Clinical Implications

The results have practical implications for reproductive healthcare. Because a large majority of participants reported at least mild depression and anxiety symptoms, psychological distress should be taken seriously in services supporting women with recurrent miscarriage. Routine screening could be considered as part of follow-up care, using brief tools such as DASS-21 or similar measures.

The consistent association between resilience and lower distress also suggests that resilience-focused support may be useful. This does not have to depend on specialist mental health infrastructure. For example, brief psychoeducation, problem-solving support, cognitive reframing strategies, and peer support groups could be integrated into existing clinic visits. Women who screen positive for more severe symptoms could be referred to trained counsellors or mental health services where available. Rounding up, the findings suggest it may be helpful to pay particular attention to women who are divorced and women who experienced a miscarriage more recently, as they may be at higher risk for certain distress outcomes.

Conclusion

Women with recurrent miscarriage in Lagos State reported high levels of psychological distress, especially depression and anxiety symptoms. Resilience was significantly associated with lower depression, anxiety and stress scores after controlling for sociodemographic factors. Overall, the findings add evidence from a Nigerian setting that psychological screening and resilience-focused support could be valuable within reproductive healthcare services, and they provide a basis for further research in other parts of Nigeria.

Limitations and Recommendations

Several limitations should be considered when interpreting these findings. Being cross-sectional, the study cannot establish that the associations found are causal. Resilience may reduce distress, but it is equally possible that women who feel less distressed rate themselves as more resilient, or that both influence each other over time. Direction could only be clarified through longitudinal research.

The sample was purposive, drawn from healthcare facilities and online networks in Lagos State, so it may not represent women with recurrent miscarriage in other Nigerian states or rural settings. Recruitment setting may also have influenced symptom levels, though this was not tested directly, since hospital-recruited and online-recruited participants were not compared. Future work could examine this more directly.

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Self-report measures were relied on throughout the study, which can be affected by social desirability and common method bias (Podsakoff et al., 2003). The DASS-21 also assesses symptom severity rather than providing clinical diagnoses, so the results should not be read as diagnostic prevalence. Clinical interviews or mixed-method approaches would strengthen future studies on this point.

Some potentially important factors were not measured in detail, including prior mental health history, quality of partner support, experiences of stigma, and access to counselling, and these could partly explain the distress levels found. Broader sampling and inclusion of these variables would improve generalisability in future research.

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Declaration on the Use of Artificial Intelligence (AI) The authors declare that AI-assisted technologies were used during the preparation of this manuscript. AI-assisted technology was used solely for grammar editing purposes. All analysis, interpretation, discussion, and original content of this manuscript were conceived and written by the authors. All AI-assisted content was reviewed and verified by the author(s), who take full responsibility for the accuracy, originality, integrity, and final content of the manuscript

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