



MEDIATORS OF DEPRESSION ON BAROREFLEX DYSFUNCTION IN POSTPARTUM ORTHOSTATIC HYPOTENSION WITH FAMILY SCAPEGOATING ABUSE

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Abstract:

Background: Orthostatic hypotension (OH) poses cardiovascular risks to postpartum women amid physiological shifts, yet its interplay with psychosocial stressors like family scapegoating abuse (FSA) remains underexplored. **Methods:** This cross-sectional study recruited 666 postpartum women aged 20-30 years from Ndola, Zambia health facilities. OH diagnosis involved supine and standing blood pressure measurements. FSA-25 and DASS-21 assessed psychosocial factors. Structural equation modeling tested mediation pathways; ROC analysis determined FSA-25 cutoffs. **Results:** OH prevalence reached 13.96%, strongly linked to elevated FSA ($\chi^2(3) = 223.72$, $p < 0.001$). Depression heightened OH risk (Coef. = 0.248, $p < 0.001$), with employment and FSA partially mediating (employment: Coef. = -0.112 for OH, 0.055 for depression, both $p < 0.005$; FSA: Coef. = 0.865 for depression, $p < 0.001$). Anxiety amplified effects; education attenuated depression; BMI directly predicted OH (Coef. = 0.077, $p < 0.001$). Stress influenced depression without OH impact; parity and symptom severity showed no significance.

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ROC identified an FSA cutoff of 4.00 for depression-aligned grading. **Conclusions:** FSA, employment, anxiety, education, and BMI mediate depression's role in postpartum OH. Routine integrated screening with FSA ordinal scales could enhance maternal cardiovascular care.

Keywords: family scapegoating abuse, orthostatic hypotension, post-partum, baroreflex

1. Introduction

Orthostatic hypotension (OH), defined by a sudden drop in blood pressure upon standing, leads to symptoms like dizziness, lightheadedness, and fainting, heightening risks of falls, stroke, heart failure, and other cardiovascular issues (Freeman *et al.*; Juraschek *et al.*, 2018; Ringer, 2023; Verwoert *et al.*, 2008). Postpartum women in regions like Ndola, Zambia, face elevated OH susceptibility due to profound physiological shifts during and after pregnancy, compounded by mental health challenges such as anxiety, depression, and stress, which can worsen OH severity (Cheng, Yu-Chien *et al.*). This vulnerability is further intensified by family scapegoating abuse (FSA)—a chronic form of emotional trauma involving blame, exclusion, and distress, often targeting older siblings and linked to additional physical or sexual abuse—which disrupts cardiovascular function and mental well-being (Hamilton-Giachritsis *et al.*, 2005; Richard Lewis, 2025; MentalHealth.com, 2025). Despite evidence of these interconnected psychosocial and physiological stressors, their combined impact on postpartum health remains underexplored, particularly in resource-limited settings; this research addresses this gap by examining OH prevalence among postpartum women in Ndola, Zambia, and its associations with FSA and mental health conditions.

2. Methodology

2.1 Study Design and Setting

This cross-sectional study recruited 666 postpartum women aged 20-30 years from health facilities and community outreach programs in Ndola, Zambia. Participants were grouped by parity: 305 with one child and 361 with three children. Data collection focused on sociodemographic variables, including age, education level, employment status, and marital status, to contextualize physiological and psychosocial outcomes.

2.2 Measurements

Orthostatic hypotension (OH) was diagnosed by measuring supine blood pressure, followed by readings at 1 and 3 minutes post-standing; OH was confirmed by a systolic drop of ≥ 20 mmHg or a diastolic drop of ≥ 10 mmHg within 3 minutes (Freeman *et al.*, 2011; Campos Munoz *et al.*, 2023). Family scapegoating abuse (FSA) was evaluated using the validated 25-item Family Scapegoating Abuse Questionnaire (FSA-25; Balapala *et al.*, 2020; Smith *et al.*, 2020), while depression, anxiety, and stress symptoms were assessed

via the Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995). These tools integrated objective cardiovascular metrics with self-reported psychosocial data to examine their interplay in postpartum women.

2.3 Statistical Analysis

Descriptive statistics summarized participant characteristics. Chi-square tests assessed associations between OH presence and FSA levels, with statistical significance set at $p < 0.05$.

3. Results

3.1 Participant Characteristics

Among the 666 postpartum women aged 20-30 years, 53.8% (n=358) were 20-25 years old and 46.2% (n=308) were 26-30 years old (Table 1). Education levels were relatively high: 53% held diplomas, 20% had bachelor's degrees, and the rest had other qualifications.

Table 1: Demography of Post-partum Women

Characteristic	Category	Frequency (n)	Valid Percentage (%)
Employment	No	437	65.6
	Yes	229	34.4
Marital Status	Single/Separate/Widow	297	44.6
	Married	369	55.4
Education Levels	Primary	110	16.5
	Secondary	70	10.5
	Diploma	353	53
	Bachelors	133	20
Parity	Parity 1	305	45.8
	Parity 3	361	54.2
Age (years)	20-25	358	53.8
	26-30	308	46.2
Total		666	100

3.2 Prevalence of Orthostatic Hypotension and Psychosocial Factors

Orthostatic hypotension (OH) affected 93 participants (14%), defined by a systolic drop ≥ 20 mmHg or diastolic drop ≥ 10 mmHg at 1 or 3 minutes post-standing, while 573 (86%) showed no OH.

Table 2: Orthostatic Hypotension and Family Scapegoating Abuse

	OH=1	OH=0	Total
FSA=0	23	479	502
FSA=1	0	28	28
FSA=2	36	52	88
Total	93	573	666

Regarding family scapegoating abuse (FSA) per the FSA-25, 75% reported none, 4% mild, 13% moderate, and 7% severe. Elevated FSA-25 and DASS-21 scores (for depression, anxiety, and stress) positively correlated with orthostatic blood pressure changes, with greater intolerance among those reporting higher psychosocial distress (Velten *et al.*, 2020; Ringer, 2023).

3.3 Associations

Women with OH were significantly more likely to report moderate or severe FSA than those without (Table 2), underscoring a link between chronic psychophysiological stress and postpartum cardiovascular autonomic dysfunction.

Table 3: Grading System for FSA25 Scores

Grade	FSA25 Total Score Range	Interpretation (Relative to DASS21 Depression Severity)
0	0 to <4	No or Minimal Risk
1	4 to <7	Mild to Moderate Risk
2	7 to <11	Moderate to Severe Risk
3	11 and above	Severe to Very Severe Risk

4. Discussion and Implications

4.1 Prevalence and Screening Needs

Postpartum women in Ndola exhibited a 13.96% OH prevalence, mirroring trends in analogous cohorts and reinforcing the value of systematic screening in this vulnerable phase (Wright).

4.2 Interplay of Psychosocial Stress and OH

Notably, intensified family scapegoating abuse strongly predicted OH, illustrating how emotional family stressors impair postpartum cardiovascular stability—likely through autonomic dysregulation or persistent anxiety (Ebong, Imo A *et al.*, 2024).

4.3 Broader Clinical and Contextual Recommendations

Findings support comprehensive postpartum strategies blending mental and physical health support, especially in Zambia amid entrenched family influences and stigma surrounding psychological issues (Ahad, Ahmed A. *et al.* 2023). Embedding FSA and mental health screenings promises to mitigate OH complications like falls and syncope via proactive care.

4.4 Tool Validation Insights

ROC evaluation of FSA-25 against DASS-21 depression yielded a 4.00 threshold with robust specificity and fair sensitivity (Table 3), enabling graded clinical use tied to standard severity metrics—pending multi-population confirmation.

4.5 Study Constraints and Next Steps

Reliance on self-reports risks under- or over-reporting of abuse, while the cross-sectional approach precludes causality. Future longitudinal designs should monitor trajectories to inform precise, integrated interventions.

5. Conclusion

This research identifies orthostatic hypotension (OH) as a common issue among postpartum women in Ndola, Zambia (13.96% prevalence), with a robust, parity-independent connection to family scapegoating abuse (FSA) and psychological distress, as captured by FSA-25 and DASS-21 scores. Women facing higher FSA levels displayed pronounced orthostatic intolerance, beyond mere physiological shifts.

Ordinal FSA grading enhances its clinical utility, aligning with depression benchmarks for streamlined assessments. These results champion a biopsychosocial model for postpartum care, urging routine primary-level screening for OH alongside FSA and mental health to curb risks like falls, syncope, and cardiovascular events.

Although the cross-sectional design limits causality claims, it lays the groundwork for longitudinal trials and multidisciplinary interventions blending cardiology, psychology, and family support to safeguard maternal well-being.

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Conflict of Interest Statement

The authors declare no conflict of interest.

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