

Original Article

PREVALENCE AND PREDICTORS OF POSTPARTUM DEPRESSION AMONG  
WOMEN ATTENDING IMMUNIZATION CLINICS IN PRIMARY HEALTH CENTERS  
IN ALIMOSHO LOCAL GOVERNMENT AREA, LAGOS STATE

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**ABSTRACT**

Postpartum depression (PPD) is a very serious public health problems in developing countries like Nigeria. This study is a descriptive cross-sectional study to evaluate the prevalence and predictors of PPD among women attending Alimosho local government area of Lagos, Nigeria. The research reached 407 postpartum women who attended two primary health care facilities for infant immunization between 2 weeks to 24 weeks (6 months) post-delivery in the Alimosho Local Government Area. The Edinburgh Postnatal Depression Scale (EPDS), an EPDS cut off mark  $\geq 13$  was used in the assessment of PPD. In this setting, the prevalence of PPD stands alarmingly high at 43.5%, far above the global averages and above previous regional estimates, thus pointing to a potentially severe mental health crisis. Analysis demonstrated some significant risk factors that contributed to this rising rate of PPD. For example, it was observed that women with only primary or no formal education showed 74.1% higher chances than the ones who had tertiary education, and below-average income earners reported a 46.6% higher risk as compared to women earning average income. In fact, unmarried, separated, or divorced women were found to have a 73.9% increased risk of developing PPD as compared to married women, while women who had anxiety or worry before their pregnancy had a 60.6% heightened risk for PPD. The findings underpin the urgent need for psychosocial interventions, improved policies of screening at primary health care level, support programs for single mothers who are vulnerable with lower education and income, and integration of mental health services within the usual maternal care. The study thus advocates for community-based support systems targeting vulnerable populations and presents very good evidence to inform the introduction of comprehensive maternal mental health initiatives within the primary health-care framework in Lagos State.

Keywords: Postpartum Depression (PPD), Maternal Mental Health, Mental Health Interventions, Maternal Care Pathways

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## INTRODUCTION

The birth of a new baby is a happy event, though it can also be overwhelming, especially for the new mothers experiencing the change to motherhood. This period is a time with deep physical and emotional alterations, and therefore mothers are at risk for developing mental health issues such as postpartum depression (PPD)<sup>1</sup>. To start, women complain about the "baby blues," transient symptoms of worry, sadness and sorrow<sup>2,3</sup>. But if these symptoms last for longer than a few weeks, they may signal postpartum depression, a potentially serious disorder which needs medical management. Postpartum depression (PPD), also known as postnatal depression (PND), is one of the most common mood disorders of women during the first year postpartum, and estimates for healthy women affected by PPD is around 17%<sup>4,5,25,26</sup>.

Consequences of PPD are not limited to the mother and may result in the mother being unable to bond with her child or to negatively impact the development of the child in learning IQ, language and behaviour<sup>6,7,8</sup>. Moreover, the mother's quality of life and her connections with her

partner might also suffer from depressive symptoms<sup>9</sup>. Risk factors and predictors for PPD include prior history of depression, with recurrence being more likely for those who previously experienced depressive episodes<sup>10</sup> as well as the presence of some sociodemographic, obstetric and psychosocial characteristics [30-36]<sup>24</sup>. Interestingly, postpartum depression rates are 3.5 times higher than depression rates during pregnancy<sup>11,12</sup>.

The prevalence of PPD varies widely by socioeconomic context, with rates of 9.5% in high-income countries, 20.8% in middle-income countries, and 25.8% in low-income countries<sup>13,14</sup>. While some data on prevalence rate are available<sup>27,28,29</sup>, despite a great deal of research in Nigeria with regard to PPD, there are no nationally representative PPD prevalence data. This disparity is particularly worrying in urban areas such as Lagos, where women are exposed to additional risk factors, such as economic hardship, urban challenges, restricted access to psychological services, etc. For instance, the Alimosho Local Government Area in Lagos—one of the most populous in Nigeria—serves as an

important focal point for studying the prevalence and predictors of PPD in urban Nigerian settings. From the perspective of primary Health Centers, particularly with regard to uptake of vaccines, highly likely are immunization clinics, potentially providing ideal places for screening of postpartum mothers as these are points of primary healthcare interactions for mothers<sup>15</sup>.

PPD is broadly occurring but is often under-recognized in primary care, when many women are hindered from describing their experiences or identifying depressive states<sup>16,17</sup>. More commonly, mothers are unaware of PPD and reluctant to get professional help due to stigma. Postnatal hormonal fluctuations are associated with increased PPD risk, especially during the first 3 months postpartum, and depressive symptoms increase dramatically<sup>18,19,20</sup>. After 5 weeks postpartum, the risk for depression is approximately three times

greater, although risk generally decreases by 6 months and plateaus within 1 year<sup>21,22</sup>. Since about 30% of PPD patients have symptoms lasting at least 1 year<sup>23</sup>, it is important to identify and intervene early. Such intervention can be implemented successfully via primary care, and will improve outcome not only for the mother but also for the neonate.

It is against this background that this study aims to evaluate the prevalence and predictors of postpartum depression among women attending immunization clinics in primary health centres in Alimosho Local Government Area (LGA), Lagos state. The study would specifically determine the prevalence of postpartum depression among women attending immunization clinics in primary health centers in Alimosho LGA of Lagos state as well as try to identify factors that predict depression Amongst Postpartum Women Attending Immunization Clinics in Alimosho LGA Primary Health Centers.

## **MATERIALS AND METHODS**

This was a descriptive cross-sectional design of a study which attempted to understand the prevalence and factors associated with postpartum depression in women who went to immunization clinics in Primary Health Centers (PHCs) in Alimosho Local Government Area of Lagos State.

The study took place in two primary healthcare centers— Igbogilla PHC and Bada PHC—located in Alimosho Local Government Area (LGA), the largest LGA in Lagos State, with an estimated population of 11 million residents. The oldest one, Igbogilla PHC, is manned by four doctors, fifteen nurses and five Community health extension workers

(CHEWs), while the 2004 Bada PHC is managed by a nurse and a CHEW. The two facilities offer routine primary health care, such as immunization, perinatal care, and preventive care.

The study population comprised postpartum women aged 18 years and above who were within 2-24 weeks postpartum and attending immunization clinics at the selected PHCs. Inclusion criteria specified that participants should be postpartum women residing within Alimosho LGA, aged 18 or older, within 2-24 weeks postpartum, and attending the designated immunization clinics. Exclusion criteria excluded women with a prior history of mental illness or current psychiatric disorders, those with severe medical co-morbidities, women with severely ill children, or those who had experienced childbirth complications.

The minimum sample size was calculated on the basis of the Cochrane formula, which applied a Z-score of 1.96 for 95% confidence interval, a prevalence (p) of 35.6% according to a previous study in Lagos, and a margin of error (d) of 0.05. After correction by a finite population (and 30% for non-response), a total sample of 407 participants was selected. A systematic random sampling method was used, with 319 participants sampled from PHC A (Igbogilla) at an interval of 7, and 88 from PHC B (Bada), also at an interval of 7.

Validated instruments were used for data collection. The Edinburgh Postnatal Depression Scale (EPDS), a 10-item self-report scale, assessed symptoms of depression over the past seven days, with scores ranging from 0 to 30. A cut-off score of 13 or higher indicated clinical depression, with sensitivity at 86% and specificity at 78%. The scale's reliability, measured by Cronbach's alpha, was 0.83. Besides, a semi-structured questionnaire also collected data about socio-demographic characteristics, maternal and infant characteristics, personal information, and risk factors.

Data collection spanned four weeks, conducted by ten trained research assistants who received training on research ethics and the administration of study tools. Pilot testing with 10% of the sample size was done in Ikeja, Lagos State, to determine the clarity and manageability of the instruments.

Data were analyzed using SPSS version 23.0. Descriptive statistics summarized demographic characteristics, chi-square tests assessed associations between variables, and logistic regression analysis identified predictors of postpartum depression. The statistical significance was defined as  $p \leq 0.05$  at 95% confidence interval.

The study obtained ethical approval from the Health Research Ethics Committee (HREC) of the University of Port-Harcourt Teaching Hospital, the Lagos State PHC Board, and the Medical Officer of Health of the participating PHCs. Informed consent

was acquired from all participants, ensuring confidentiality throughout the study. Participation was voluntary and participants were informed of their right to discontinue participation at any moment without penalty

## RESULTS

**Table 1: Socio-demographic characteristics and maternal factors of the respondents (N = 377)**

| VARIABLES          | FREQUENCY    | PERCENTAGE |
|--------------------|--------------|------------|
| <b>Age (years)</b> |              |            |
| ≤ 30               | 213          | 56.5       |
| > 30               | 164          | 43.5       |
| Mean age (SD)      | 30.2 (±5.27) |            |
| <b>Ethnicity</b>   |              |            |
| Igbo               | 58           | 15.4       |
| Yoruba             | 281          | 74.5       |
| Hausa              | 8            | 2.1        |
| Others             | 30           | 8.0        |
| <b>Occupation</b>  |              |            |
| Unemployed         | 44           | 12.4       |
| Student            | 11           | 3.1        |
| White-collar       | 75           | 21.2       |
| Business           | 224          | 63.3       |
| <b>Education</b>   |              |            |
| None               | 6            | 1.6        |
| Primary school     | 32           | 8.5        |
| Secondary school   | 149          | 39.5       |
| Tertiary school    | 190          | 50.4       |
| <b>Income</b>      |              |            |

|                       |     |      |
|-----------------------|-----|------|
| Below average         | 122 | 35.1 |
| Average               | 196 | 56.3 |
| Above average         | 30  | 8.6  |
| <b>Employment</b>     |     |      |
| Unemployed/Job seeker | 80  | 21.2 |
| Self- employed        | 218 | 57.8 |
| Civil servant         | 79  | 21.0 |
| <b>Marital status</b> |     |      |
| Single                | 14  | 3.7  |
| Married               | 348 | 93.0 |
| Separated             | 8   | 2.1  |
| Divorced              | 4   | 1.1  |

**SD**= Standard deviation; **Others**: minority tribes in Nigeria.

In Table 1, majority of the post-partum women were 30 years and below (56.5%), while 44% of them were above the age of 30, with a mean age of  $30.2 \pm 5.27$ . A larger proportion belongs to the Yoruba tribe with 74.5%, Igbo accounted for 15.4%, while the Hausa and other minority tribes in Nigeria were the least represented with 10.1%. About 63% of women were businesswomen, 21.2% had white-collar jobs, 12.4% were currently unemployed, while women who were still students represented the least (3.1%). A few had up to primary education (10.1%), 39.5% had

secondary education, while the majority were tertiary education holders (50.4%). Majority of the women were self-employed (57.8%), women who were currently unemployed and seeking jobs accounted for 21.2%, while civil servants were 21%. Regarding income, a larger proportion of the women were average income earners (56.3%), 35% earn below average, while only 8.6% get above-average monthly. Many of the respondents were married (93%), 3.7% were single mothers, while 3.2% were separated and divorced.

**Table 2: Socio-demographic characteristics and maternal factors of respondents**

| VARIABLES                  | FREQUENCY | PERCENTAGE |
|----------------------------|-----------|------------|
| <b>Age of baby (weeks)</b> |           |            |
| 2- 10 weeks                | 187       | 49.6       |
| 11-20 weeks                | 126       | 33.4       |

|                                                 |                     |      |
|-------------------------------------------------|---------------------|------|
| >20 weeks                                       | 64                  | 17.0 |
| Mean age (SD)                                   | 11.78 ( $\pm$ 6.45) |      |
| <b>Gender of the baby</b>                       |                     |      |
| Male                                            | 187                 | 49.6 |
| Female                                          | 183                 | 48.5 |
| Twins                                           | 7                   | 1.9  |
| <b>Satisfaction with the gender of the baby</b> |                     |      |
| Yes                                             | 371                 | 98.4 |
| No                                              | 6                   | 1.6  |
| <b>Pregnancy planned</b>                        |                     |      |
| Yes                                             | 287                 | 76.9 |
| No                                              | 86                  | 23.1 |
| <b>Are you a first-time mother</b>              |                     |      |
| Yes                                             | 138                 | 36.6 |
| No                                              | 239                 | 63.4 |
| <b>Number of previous children</b>              |                     |      |
| None                                            | 135                 | 36.0 |
| One                                             | 83                  | 22.1 |
| Two                                             | 83                  | 22.1 |
| > Two                                           | 74                  | 19.7 |
| <b>Worried and sad</b>                          |                     |      |
| <b>Before the pregnancy</b>                     |                     |      |
| Yes                                             | 46                  | 12.2 |
| No                                              | 230                 | 61.0 |
| Sometimes                                       | 93                  | 24.7 |
| Often                                           | 8                   | 2.1  |
| <b>Worried and sad</b>                          |                     |      |
| <b>During the pregnancy</b>                     |                     |      |
| Yes                                             | 43                  | 11.4 |

|           |     |      |
|-----------|-----|------|
| No        | 174 | 46.2 |
| Sometimes | 150 | 39.8 |
| Often     | 10  | 2.7  |

As shown in Table 2, less than half (49.6%) of women had babies between age 2 weeks and 10 weeks, 33.4% accounted for 11 weeks to 20 weeks infants, while 17% of babies were above 20 weeks. The mean age of the children was  $11.78 \pm 6.45$ . Only 1.9% of twin birth were recorded, while 49.6% were male single birth and 48.5% were female single birth. Almost all the women were satisfied with the gender of their baby (98.4%), while 1.6% of women expressed dissatisfaction. Women who planned their pregnancy were 76.9%, while 23.1% didn't plan it. The majority of the women have had children before (63.4%), while 36.6% were first-time mothers. 22% had given birth to

one previously, 22% had 2 children before this current birth, while 19.7% of women had previously birthed more than two children. Majority of the women said that they were never worried and sad before the pregnancy (61%), 12.2% confirmed they were worried and sad before the pregnancy, 24.7% experienced it sometimes, while only 2% were often worried and sad before the pregnancy. Also, during the pregnancy, 11.4% women were worried and sad, 39.8% experienced that feelings sometimes, 2.7% experienced it often, while 46.2% women were not worried and sad during the pregnancy.

### **Objective 1 – Prevalence of Postpartum depression among women attending immunization clinic in PHC centres in Alimosho, Lagos**

**Table 3: Edinburgh postnatal Depression scale (EPDS)**

| S/N | VARIABLES                                                  | 0<br>N (%) | 1<br>N(%) | 2<br>N(%)  | 3<br>N(%) |
|-----|------------------------------------------------------------|------------|-----------|------------|-----------|
| 1   | I have been able to laugh and see the funny side of things | 229 (60.7) | 92 (24.4) | 41 (10.9)  | 15 (4.0)  |
| 2   | I have looked forward with enjoyment to things             | 205 (54.4) | 91 (24.1) | 61 (16.2)  | 20 (5.3)  |
| 3   | I have blamed myself unnecessarily when things went wrong  | 64 (17.0)  | 77 (20.4) | 145 (38.5) | 91 (24.1) |
| 4   | I have been anxious or worried for no good reason          | 104 (27.6) | 28 (7.4)  | 221 (58.6) | 24 (6.4)  |

|    |                                                            |            |            |            |           |
|----|------------------------------------------------------------|------------|------------|------------|-----------|
| 5  | I have felt scared or panicking for no very good reason    | 84 (22.3)  | 87 (23.1)  | 155 (41.1) | 51 (13.5) |
| 6  | Things have been getting on top of me                      | 71 (18.8)  | 101 (26.8) | 131 (34.7) | 74 (19.6) |
| 7  | I have been so unhappy that I have had difficulty sleeping | 98 (26.0)  | 74 (19.6)  | 141 (37.4) | 64 (17.0) |
| 8  | I have felt sad or miserable                               | 163 (43.2) | 127 (33.7) | 50 (13.3)  | 37 (9.8)  |
| 9  | I have been so unhappy that I have been crying             | 136 (36.1) | 140 (37.1) | 47 (12.5)  | 54 (14.3) |
| 10 | The thought of harming myself has occurred to me           | 263 (69.8) | 27 (7.2)   | 66 (17.5)  | 21 (5.6)  |

N = number of respondents; 0 =not at all, hardly at all, no never, no – not at all, no – I have been coping as well as ever, never; 1 = Definitely not so much now, definitely less than I used to, not very , hardly ever, no – not much, no most of the time I have coped quite well, only occasionally; 2= Not quite so much now, rather less than I used to, yes some of the time, yes sometimes; 3= As much as I always could, as much as I ever did, yes most of the time, yes very often, yes quite a lot, yes most of the time I haven't been able to cope at all, yes quite often.

In table 3, 61% of women have been able to see the funny side of things, while 5.3% hardly look forward with enjoyment to things. Women who blamed themselves

unnecessarily most of the time when things go wrong was 24%, 28% haven't been anxious or worried for no very good reason, while 6.4% have been anxious or worried for no good reason. 41% sometimes feel scared or panicky for no good reason, while 20% confirmed that things have been getting on top of them most of the time. 17% had difficulty sleeping due to unhappiness, while about 10% of women felt sad or miserable. 37% said that sometimes they have been so unhappy that they have been crying, while about 6% confirmed that the thought of harming themselves has occurred to them, although about 70% disagreed with having such harmful thoughts.

**Table 4: Depression amongst Post-Partum Women in Alimosho L.G.A of Lagos state**

| VARIABLES     | FREQUENCY | PERCENTAGE |
|---------------|-----------|------------|
| Depressed     | 164       | 43.5       |
| Not depressed | 213       | 56.5       |

EPDS  $\geq 13$  = Clinically Depressed; EPDS  $< 13$  = Not Depressed

In table 4, 43.5% of postpartum women are depressed, while 56.5% of women are residing in Alimosho L.G.A of Lagos state not depressed.

**Objective 2: Factors that predict depression Amongst Postpartum Women Attending Immunization Clinics in Alimosho Primary Health Centers**

**Table 5: Association between respondent's socio-demographic characteristics and depression (Pearson chi-square)**

| VARIABLES          | DEPRESSION<br>NO (%) | YES (%)    | $\chi^2$ | P-VALUE |
|--------------------|----------------------|------------|----------|---------|
| <b>Age (years)</b> |                      |            |          |         |
| ≤30                | 113 (53.1)           | 100 (46.9) | 2.37     | 0.143   |
| >30                | 100 (61.0)           | 64 (39.0)  |          |         |
| <b>Ethnicity</b>   |                      |            |          |         |
| Igbo               | 35 (60.3)            | 23 (39.7)  | 2.56     | 0.277   |
| Yoruba             | 161 (57.3)           | 120 (42.7) |          |         |
| Hausa/ others      | 17 (44.7)            | 21 (55.3)  |          |         |
| <b>Occupation</b>  |                      |            |          |         |
| Unemployed         | 15 (34.1)            | 29 (65.9)  | 19.22    | <0.001  |
| Student            | 6 (54.5)             | 5 (45.5)   |          |         |
| White-collar       | 56 (74.7)            | 19 (25.3)  |          |         |
| Business           | 124 (55.4)           | 100 (44.6) |          |         |
| <b>Education</b>   |                      |            |          |         |
| None/primary       | 14 (36.8)            | 24 (63.2)  | 19.85    | <0.001  |
| Secondary          | 71 (47.7)            | 78 (52.3)  |          |         |
| Tertiary           | 128 (67.4)           | 62 (32.6)  |          |         |
| <b>Income</b>      |                      |            |          |         |
| Below average      | 54 (44.3)            | 68 (55.7)  | 14.68    | 0.001   |
| Average            | 128 (65.3)           | 68 (34.7)  |          |         |
| Above average      | 20 (66.7)            | 10 (33.3)  |          |         |
| <b>Employment</b>  |                      |            |          |         |

|                                                   |             |            |       |                |
|---------------------------------------------------|-------------|------------|-------|----------------|
| Unemployed/Job<br>Seeker                          | 34 (42.5)   | 46 (57.5)  | 15.67 | < <b>0.001</b> |
| Self-employed                                     | 121 (55.5)  | 97 (44.5)  |       |                |
| Civil servant                                     | 58 (73.4)   | 21 (26.6)  |       |                |
| <b>Age of baby (weeks)</b>                        |             |            |       |                |
| 2-10 weeks                                        | 103 (55 .1) | 84 (44.9)  | 0.41  | 0.808          |
| 11 – 20 weeks                                     | 74 (58.7)   | 52 (41.3)  |       |                |
| >20 weeks                                         | 36 (56.3)   | 28 (43.8)  |       |                |
| <b>Gender of your baby</b>                        |             |            |       |                |
| Male                                              | 107 (57.2)  | 80 (42.8)  | 0.08  | 0.951 F        |
| Female                                            |             | 81(44.3)   |       |                |
|                                                   | 102(55.4)   |            |       |                |
| Twins                                             | 4 (57.1)    |            |       |                |
|                                                   |             | 3(42.9)    |       |                |
| <b>Satisfied with the gender<br/>of your baby</b> |             |            |       |                |
| Yes                                               | 211 (56.9)  | 160 (43.1) | 1.33  | 0.410 F        |
| No                                                | 2 (33.3)    | 4 (66.7)   |       |                |
| <b>Pregnancy planned</b>                          |             |            |       |                |
| Yes                                               | 168 (58.5)  | 119 (41.5) | 2.53  | 0.137          |
| No                                                | 42 (48.8)   | 44 (51.2)  |       |                |
| <b>Marital status</b>                             |             |            |       |                |
| Single\ separated                                 | 5 (19.2)    | 21 (80.8)  | 15.72 | < <b>0.001</b> |
| Divorced                                          |             |            |       |                |
| Married                                           | 206 (59.2)  | 142 (40.8) |       |                |
| <b>Are you a first-time<br/>mother</b>            |             |            |       |                |
| Yes                                               | 81 (58.7)   | 57(41.3)   | 0.43  | 0.520          |
| No                                                | 132 (55.2)  | 107(44.8)  |       |                |
| <b>Number of previous<br/>children</b>            |             |            |       |                |
| None                                              | 79(58.5)    | 56(41.5)   | 7.33  | 0.062          |

|                                             |            |            |       |              |
|---------------------------------------------|------------|------------|-------|--------------|
| One                                         | 47 (56.6)  | 36(43.4)   |       |              |
| Two                                         | 53 (63.9)  | 30 (36 .1) |       |              |
| >two                                        | 32 (43.2)  | 42 (56.8)  |       |              |
| <b>Worried and sad</b>                      |            |            |       |              |
| <b>Before pregnancy</b>                     |            |            |       |              |
| Yes                                         | 17 (37.0)  | 29 (63.0)  | 13.72 | <b>0.001</b> |
| No                                          | 146 (63.5) | 84 (36.5)  |       |              |
| Often\ sometimes                            | 50 (49.5)  | 51 (50.5)  |       |              |
| <b>Worried and sad during the pregnancy</b> |            |            |       |              |
| Yes                                         | 18 (41.9)  | 25 (58.1)  | 6.24  | <b>0.044</b> |
| No                                          | 108 (62.1) | 66 (37.9)  |       |              |
| Often/sometimes                             | 87 (54.4)  | 73 (45.6)  |       |              |

F = Fisher's Exact, P-value<0.05

Table 5 has indicated that depression is unrelated to gestational age of mother, ethnicity, gestational age of the baby, sex of the baby, degree of satisfaction with the sex of the baby, whether the pregnancy was accidental or not, first-time pregnancy, and number of past pregnancies ( $P>0.05$ ). There was a strong correlation between depression and occupation, education, employment, marital status, worried and

sad prior and during pregnancy ( $P<0.05$ ). Single/Separated/divorced women were more depressed (80.8%), women with less than secondary education were more depressed (63.2%), unemployed women were also more depressed(57.5%), women who conceived fears before the pregnancy(63%), and during pregnancy(58%), were also more depressed.

**Table 6: Binary Logistic Regression Analysis of Depression**

| VARIABLES                | COEFFICIENT | AOR   | 95% CI       | P-VALUE |
|--------------------------|-------------|-------|--------------|---------|
| <b>Occupation</b>        |             |       |              |         |
| Unemployed (Reference)   |             |       |              |         |
| Student                  | -0.879      | 0.415 | 0.064- 2.680 | 0.356   |
| White-collar             | -1.488      | 0.226 | 0.047-1.085  | 0.063   |
| Business                 | -0.761      | 0.467 | 0.147- 1.488 | 0.198   |
| <b>Education</b>         |             |       |              |         |
| None/primary (reference) |             |       |              |         |
| Secondary                | -0.772      | 0.462 | 0.182-1.173  | 0.104   |

|                                         |        |       |               |              |
|-----------------------------------------|--------|-------|---------------|--------------|
| <b>Tertiary Income</b>                  | -1.351 | 0.259 | 0.097-0.689   | <b>0.007</b> |
| Below average (Reference)               |        |       |               |              |
| Average                                 | -0.628 | 0.534 | 0.311-0.916   | <b>0.023</b> |
| Above average                           | -0.759 | 0.468 | 0.175 – 1.252 | 0.130        |
| <b>Worried and sad before pregnancy</b> |        |       |               |              |
| Yes (Reference)                         |        |       |               |              |
| No                                      | -0.930 | 0.394 | 0.177-0.879   | <b>0.023</b> |
| Often/ sometimes                        | -0.545 | 0.580 | 0.246 – 1.363 | 0.211        |
| <b>Employment</b>                       |        |       |               |              |
| Self-employed                           | 0.634  | 1.884 | 0.713-4.982   | 0.202        |
| Civil servant                           | 0.611  | 1.843 | 0.419-8.103   | 0.419        |
| <b>Marital status</b>                   | -1.345 | 0.261 | 0.082-0.829   | <b>0.023</b> |

AOR= Adjusted Odds ratio; CI = Confidence interval; P<0.05

As seen in Table 6, female subjects with tertiary education were (analyzed according to the adjusted odds ratio [AOR] 0.259, a 95% confidence interval [CI] 0.097– 0.689) less depressed than female subjects with primary or without education. In the same light, women with average monthly income were less likely to be depressed than women who earn below-average monthly (AOR= 0.534, 95%CI; 0.311-0.916).

## DISCUSSION

The findings from this study reveal a concerning high prevalence of postpartum depression (PPD) among women attending immunization clinics in Alimosho, Lagos, Nigeria. The screening revealed (Table 4) a 43.5% prevalence of PPD. These percentages are much greater than those reported in studies done in the past in the rest of the world and in Africa.

For example, a survey in Kenya showed a PPD prevalence of 20%<sup>37</sup>, while studies

Women who were never worried and sad before pregnancy were less likely to become depressed than women who suffered from worry and sadness before pregnancy. (AOR= 0.394, 95%CI; 0.177-0.879). Finally, married women were less depressed in comparison to single, separated and divorced women. (AOR =0.261, 95%CI; 0.082-0.829).

done in Sudan and Ethiopia recorded prevalence of 9%<sup>38</sup> and 23.3%<sup>39</sup>, respectively. In Nigeria, a study in Lagos state found a PPD prevalence of 35.6%<sup>24</sup>, and studies in Enugu reported 33.3% PPD<sup>40</sup>. Elsewhere, studies have reported lower rates, such as 8% PPD in Japan<sup>41</sup>, 9% in Canada<sup>42</sup>, and 19% in Qatar<sup>43</sup>.

The relative high prevalence obtained in the present study may be due to the wide range of assessment time period (between

2 weeks and 24 weeks postpartum). This enabled identification of a greater number of depressed episodes as other studies had targeted women during the restricted period between 4 and 16 weeks postnatally. Furthermore, the reliance on varied assessment methods, sample sizes, and economic factors among the areas examined may explain the variation in observed prevalence rates<sup>44</sup>.

Edinburgh Postnatal Depression Scale (EPDS) was employed to screening women's mental status. The EPDS responses revealed that a significant proportion of women experienced symptoms such as feeling unable to laugh and see the funny side of things (10.9%), difficulty looking forward with enjoyment to things (16.2%), unnecessary self-blame (38.5%), anxiety or worry for no good reason (58.6%), feeling scared or panicky (41.1%), feeling that things were getting on top of them (34.7%), difficulty sleeping due to unhappiness (37.4%), feeling sad or miserable (13.3%), and even having thoughts of self-harm (17.5%) (Table 3). These findings underscore the substantial burden of postpartum mental health issues faced by women in this community.

The analysis of the socio-demographic factors associated with postpartum depression revealed several key findings. Marital status, education level, monthly income, and the presence of worry and

sadness before and during pregnancy were identified as significant predictors of depression.

Married women were less likely to be depressed compared to single, separated, or divorced women (Adjusted Odds Ratio [AOR] = 0.261, 95% CI: 0.082-0.829) (Table 6). This is in line with other research showing increased rates of depression for unmarried or unsupported mothers<sup>45,46,47,48,49</sup>. The increased risk of depression among single mothers may be attributed to the lack of spousal support and the added burden of caring for a child without a partner.

Women with tertiary education were less likely to be depressed than those with primary education or no formal education (AOR = 0.259, 95% CI: 0.097-0.689) (Table 6). This result is consistent with other research that have emphasized the buffering role of high education for postpartum mental status<sup>44,50,51</sup>. Educated females could have better access to knowledge, resources, and services, thereby allowing the early detection and treatment of mental health problems.

Similarly, women with an average monthly income were less likely to be depressed than those with below-average income (AOR = 0.534, 95% CI: 0.311-0.916) (Table 6). Financial limitations and stressors related to the fulfilment of the

child's needs may play a role in the elevated risk of depression for women with lower socioeconomic status as reported by studies in Saudi Arabia<sup>52</sup>, Qatar<sup>43</sup>, Korea<sup>53</sup>, Western Iraq<sup>54</sup> and South India<sup>55</sup>.

Importantly, the study found that women who were worried and sad before the pregnancy were more likely to experience postpartum depression (AOR = 0.394, 95% CI: 0.177-0.879) (Table 6). This implies that prior mental health disorders or life stressors may amplify the risk of postpartum depression, highlighting the necessity for the provision of full range

## CONCLUSION

This wide-ranging study on PPD among Alimosho LGA, Lagos State, reveals a prevalence rate of 43.5%. This requires an immediate response from healthcare providers and policymakers. Subjects with primary or no formal education had 74.1% higher odds of PPD development in comparison with the subjects with tertiary education; with low-income group, they had a 46.6% higher risk than with medium income group; non-married women including widows and divorcees had a 73.9% higher propensity of developing PPD in comparison with married women; and past anxiety/worry before pregnancy had a 60.6% higher risk of PPD. Early screening within the first month postpartum should be performed with emphasis on local risk factors. Such women in acute

mental health screening and care during the prenatal and postpartum periods.

In conclusion, the high prevalence of postpartum depression observed in this study underscores the significant burden of mental health issues faced by women in the Alimosho community of Lagos, Nigeria. The identified risk factors, i.e., marital status, educational level, monthly income, and the history of mental health problems, are of great utility for the design of specific interventions as well as support systems aimed at meeting the mental health needs of postpartum women in this area.

conditions deserve psychiatric care supported by a care manager, besides, surveillance and follow-up with therapy and medication, and also selective preventive programs for high-risk groups. Empowerment of women through skill-building reduces economic burden and improves mental health status. Inclusion of mental health education at maternal clinics, the involvement of family members in the awareness thereof, and a follow-through on healthcare and support systems are pertinent for mental well-being among new mothers. This study supports a comprehensive approach to maternal mental health in Lagos State's primary healthcare system, emphasizing early identification and intervention in at-risk mothers.

## LIMITATIONS

Although this study sheds much light on the prevalence of PPD in Alimosho LGA, it also has some limitations. First, the cross-sectional design and reliance solely on self-reports from respondents with two primary health centers alone may limit causal inference and generalization. However, a large sample size used for this paper and a

high response rate obtained can somewhat help to minimize these limitations. Although the EPDS is a screening tool and not a diagnostic instrument, its validated status and sensitivity of 86% and specificity of 78% in this population, supports the reliability of our findings.

## CONFLICT OF INTEREST

The authors declare no competing interests or potential conflicts of interest in the conduct and publication of this research.

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