

## Maternal stress among pregnant women in a birth cohort in Harare, Zimbabwe

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**Abstract:** Although beneficial strides have been made in making Prevention of Mother to Child Transmission (PMTCT) of HIV protocols accessible to pregnant women, mental health issues such as maternal stress have received limited attention. The purpose of this pilot study was to characterize the prevalence, causes and ways of coping with maternal stress among HIV positive and HIV negative pregnant women in a birth cohort in Zimbabwe. A cross-sectional survey was conducted on a purposive sample of 15 HIV positive pregnant women and a control group of 15 HIV negative pregnant women from 3 antenatal clinics in Harare, Zimbabwe. The Perceived Stress Scale (PSS) was used to measure maternal stress. Data were collected through face to face interviews and use of participants' medical records. Raw data were analyzed using the Research Electronic Data Capture (REDCap) software package. Bivariate analyses (specifically the 2 independent sample Student's t-test and Fischer exact tests) were conducted. A p value of  $\leq 0.05$  was considered to be statistically significant. Ages of participants were from 18 to 43 years. Mean age was 28.1 (SD 7.1). The prevalence of maternal stress was higher (46.7%) among HIV positive pregnant women. There was no statistically significant difference in the proportion of women with maternal stress when HIV positive and HIV negative women were compared ( $p=0.256$ ). Only the average monthly family income was statistically significantly associated with maternal stress ( $p<0.001$ ). The majority, 17 (56.7%) of participants cited financial problems to be the cause of maternal stress. Nineteen (63.3%) adopted the avoidant ways of coping with stress. Further studies with larger sample sizes are recommended with a view of developing effective strategies to reduce maternal stress as well as promoting adaptive coping mechanisms among pregnant women.

**Key Words:** Maternal Stress, Stressors, Ways of coping, Coping Mechanisms

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### I. Introduction

Maternal stress has been defined as psychological distress before, during or after pregnancy and incorporates depression, anxiety, and/or perceived stress<sup>1</sup>. While emphasis has lately been on the growing seropositive population of pregnant women and accessibility of PMTCT protocols, maternal mental health issues have been largely ignored<sup>2</sup>. The prevalence of maternal stress is well documented globally and in Sub Saharan Africa<sup>2,3,4,5</sup>. The causes of stress as well as the coping mechanisms employed by the pregnant women who exhibit maternal stress are equally important. Previous studies have reported causes of maternal stress to include intimate partner violence<sup>6</sup>, economic status<sup>7,4</sup> diagnosis of HIV, being single<sup>3</sup>, unplanned pregnancy<sup>8</sup> food insecurity and job strain for the working pregnant women<sup>9</sup>. In addition, the pregnant women's ways of coping with stress are important predictors of maternal well-being. Coping skills act as potential buffers against negative maternal and child outcomes<sup>10</sup>. Very little scientific work has been done on maternal stress in Zimbabwe. Meantime, there is anecdotal evidence that pregnant women (particularly those who are HIV positive) experience a lot of stress. In addition, the social experiences leading to stress are understudied. This pilot study sought to establish the prevalence, causes and ways of coping with stress among pregnant HIV positive and HIV positive pregnant women attending urban antenatal clinics in Harare, Zimbabwe.

## **II. Material And Methods**

This research reports the findings of a pilot study conducted prior to enrolment of participants for a study on maternal stress and its effects on infant outcomes. The maternal stress study is a sub-study nested in a major University of Zimbabwe Birth Cohort (UZ-Birth Cohort) study. The UZ-Birth cohort study intends to provide a better understanding of the role of all the possible factors associated with high morbidity and mortality among HIV exposed uninfected (HEU) children.

**Study Design:** Cross sectional study design

**Study Location:** Three urban polyclinics in the high density suburbs of Harare, Zimbabwe were the study sites.

**Study Duration:** 19 January to 6 February 2015.

**Sample size:** 30 participants.

**Sample size calculation:** The sample size (10% of the desired sample size of 300 for the major study) was determined using guidelines from literature<sup>11</sup>.

**Subjects & selection method:** Two groups of pregnant women (an HIV positive group of 15 pregnant women and a control group of 15 HIV negative pregnant women) was selected. The daily antenatal clinic attendance register was used as the sampling frame from which a purposive sample of 30 participants was selected.

### **Inclusion criteria:**

1. Maternal age of at least 15 years
2. A clinically proven HIV test result
3. Pregnancy of at least 28 weeks gestation
4. Fluency in either English or the local Shona language

### **Exclusion criteria:**

1. Presence of communication barriers such as blindness, deafness and dumbness

### **Ethical Considerations**

Ethical clearance was sought from Harare City Health Department, the Joint Research Ethics Committee for The University of Zimbabwe College of Health Sciences and Parirenyatwa Group of Hospitals (JREC) as well as the Medical Research Council of Zimbabwe (MRCZ). Individual informed consent was obtained from each participant at the time of data collection.

### **Procedure methodology**

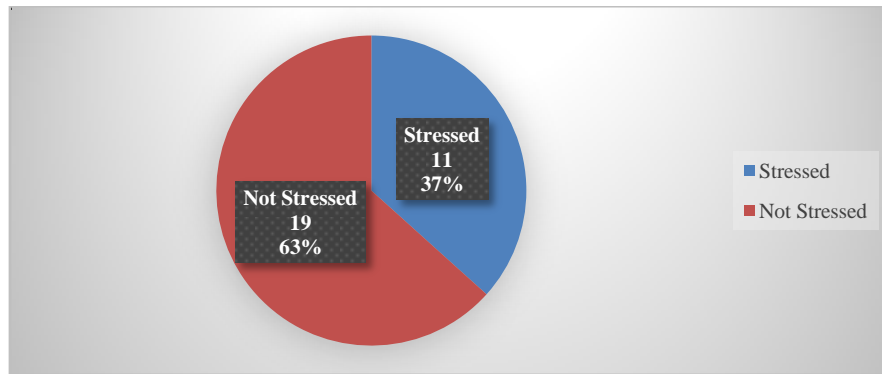
After reviewing the daily antenatal clinic attendance register at each study site, eligible participants were individually approached and written informed consent was obtained. A questionnaire was used to collect the data using face to face interviews conducted in a private consultation room. The questionnaire included sociodemographic data, items from the Perceived Stress Scale (PSS)<sup>12</sup>, one open ended question on causes of stress and a second open ended question on ways of coping with stress. The PSS is a validated 10 item self-report measure of stress, with a Cronbach's alpha between 0.84 and 0.86. In this study, Cronbach's alpha was 0.85. The 10 items in the PSS ask about the frequency of participants' feelings and thoughts in the past month. A likert scale based on never (0), Almost never (1), Sometimes (2), Fairly often (3) and Very often (4) quantifies the perceived stress for each item. Reverse scoring was applied for responses to 4 negatively phrased questions (questions 4, 5, 7 and 8). The total perceived stress scores (calculated by summing up participant scores from the 10 items) gave a range of 0 for no stress and 40 for the highest possible stress score. Participants' perceived stress scores were further categorized into 2 categorical outcome variables using a cut-off point of 13. Those participants who were not stressed had scores of 0 to 13 while those with perceived stress scores above 13 were stressed<sup>13</sup>.

### **Statistical analysis**

Raw data were analyzed using the Research Electronic Data Capture (REDCap) software package using descriptive statistics and bivariate analyses. The 2 independent sample Student's t-test was used to show if there was a statistically significant difference between the proportion of HIV positive and HIV negative pregnant women who were stressed. Fischer exact tests were conducted to compare the HIV positive and HIV negative mothers according to their socio-demographic characteristics based on their stress status. A *p* value of  $\leq 0.05$  was considered to be statistically significant.

## **III. Result**

Ages of participants were from 18 to 43 years. Mean age was 28.1 (SD 7.1). Results on prevalence of stress for both HIV positive and HIV negative women are displayed on Figure 1. The result show that 11 (37%) participants were stressed.



**Figure 1:** Prevalence of Maternal Stress

According to the results on Table 1, among the HIV positive pregnant women, 46.7% were stressed and among the HIV negative ones, 26.7% were stressed.

**Table 1:** Prevalence of stress by HIV status (N=30)

HIV status	Stress		Total
	Stressed	Not stressed	
Positive, n(%)	7(46.7)	8(53.3)	15
Negative, n(%)	4(26.7)	11(73.3)	15
Total	11(36.7)	19(63.3)	30

However, the Student's t-test showed no significant difference in the proportion of HIV positive and HIV negative women who were stressed ( $p=0.256$ ). Among the sociodemographic characteristics, the results on table 2 showed that only average monthly family income was statistically significantly associated with maternal stress ( $p<0.001$ ).

**Table 2:** Association between stress and demographic characteristics (N=30)

Characteristic	Stressed (n=11)	Not stressed (n=19)	$\chi^2$ p-value
Age			0.057 <sup>†</sup>
19 years and below	4	0	
20 year and above	7	19	
Marital status			0.087 <sup>†</sup>
Married	6	14	
Married polygamous	0	1	
Divorced/separated	0	1	
Cohabiting	5	2	
Religion			0.193 <sup>†</sup>
Apostolic	4	7	
Pentecostal	5	5	
Protestant	1	7	
Roman catholic	1	0	
Education status			1.000 <sup>†</sup>
Some primary	0	1	
Completed primary	0	1	
Some secondary	3	4	
Completed secondary	8	12	
Tertiary	0	1	
Employment status			1.000 <sup>†</sup>
Employed	1	2	
Self employed	1	2	
Not employed	9	15	
Average monthly family income (combined)			0.000 <sup>†</sup>
Below Total Consumption Poverty Line	11	15	
Above Total Consumption Poverty Line	0	4	

<sup>†</sup>Fisher's exact p-value

The majority, 17 (56.7%) of participants cited financial problems to be the cause of stress. Results on causes of stress are displayed on Table 3.

**Table 3: Causes of stress (N=30)**

Cause of stress	Frequency	Percent
Financial problems	17	56.7
Persistently low haemoglobin	1	3.3
Divorce	1	3.3
HIV positive status	2	6.7
Intimate partner violence and infidelity	3	10.0
Disagreements and lack of support from in-laws	6	20.0

With regards to the ways of coping with stress, results on Table 4 indicate that 19 (63.3%) adopted either crying, ignoring or prayer as a way of coping with stress. Only 5 participants did something active (such as adjusting the budget, seeking counselling, talking about the stressing issues and seeking financial assistance) to cope with stress.

**Table 4: Ways of coping with stress (N=30)**

Ways of coping with stress	Frequency	Percent
Crying, ignoring, praying	19	63.3
Adjusted budget	1	3.3
Sought counselling from church members	1	3.3
Forced my husband to talk about issues	1	3.3
Asked for financial assistance from family	2	6.7
Shared / Talked to others (sisters, relatives or friends or church members)	6	20.0

#### IV. Discussion

There were 4 (13.3%) pregnant adolescents aged 19 years and below in this study and all of them exhibited perceived stress scores that met the criteria for maternal stress. Adolescents are a vulnerable group who often uniquely display immaturity related stress<sup>14</sup>. In addition, adolescents show instability in relationships with intimate partners and family members during pregnancy<sup>15</sup>. If their stressful events are compounded by HIV infection and poorly managed, pregnant adolescents may even quickly develop postnatal depression<sup>16</sup>. Adolescents therefore need support for they lack both maturity and effective coping skills to the extent that they use drinking as a strategy to cope with stress<sup>8</sup>.

Although the overall proportion of women who exhibited maternal stress was 11 (37%), on cross tabulating HIV status by stress, 7 (46.7%) HIV positive pregnant women had maternal stress compared to 4 (26.7%) HIV negative pregnant women. This is an important difference to note although it was not statistically significant mainly due to the small sample size. Studies that used larger sample sizes showed higher prevalence of stress among HIV positive pregnant women. In Ghana for example, the prevalence of maternal stress among HIV positive women was 69.7% versus 51 % for the HIV negative women. In addition, HIV infection and food insecurity were independently associated with maternal stress For HIV infection, the association was actually statistically significant (Chi square .281; $p=0.004$ )<sup>4</sup>.

While previous studies established associations between maternal stress and job strain, being single, intimate partner violence, stigma and disclosure<sup>9,3,6</sup>, family income was the only sociodemographic variable statistically significantly associated with maternal stress in the present study ( $p<0.001$ ). Similarities were noted between findings of the present study and the Ghanaian study in terms of maternal stress and food insecurity<sup>4</sup>. All the 11 participants who exhibited maternal stress in the present study had an average monthly family income below the Total Consumption Poverty Line (TCPL). The TCPL is the amount of money needed to purchase both food and non-food items for a family not to be deemed poor. In Zimbabwe, this amount of money for an average of 5 persons per household stood at US\$ 481 in April 2016<sup>17</sup>. The majority of participants in this study, 26 (86.7%) had average monthly incomes below the TCPL. Such low incomes would certainly threaten food security and cause stress among the women who largely face the burden of preparing the food for the family amidst scarcity of food items. This might explain why family income emerged as the only sociodemographic characteristic statistically significantly associated with stress in this study. In addition, the finding might be a reflection of economic challenges facing the majority of families in Zimbabwe.

In view of the low family incomes reported by participants in this study, it was not surprising that 17 (56.7%) of the participants cited financial problems to be the main cause of maternal stress. When financial crisis compounds the stress of pregnancy and HIV, it becomes important for a woman to adopt effective and adaptive coping mechanisms for the benefit of her wellbeing and the wellbeing of the unborn child. Adaptive coping mechanisms, such as active coping have been found to be protective against psychological distress<sup>18</sup>. The small percentage of pregnant women utilizing active coping mechanism is a cause for concern. Instead, the majority, 19 (63.3%) of participants reported using maladaptive coping strategies of mainly avoiding the situation. According to some authors, avoidance coping is a poor coping skill which is maladaptive and in pregnant women, is associated with postpartum depression, preterm birth and poor infant development<sup>19</sup>. Therefore there is need to minimize psychological stressors among pregnant women as well as equip pregnant women with adaptive coping strategies to improve well-being.

## V. Conclusion

Although not statistically significant, HIV positive pregnant women had a higher prevalence (46.7%) of maternal stress compared to HIV negative pregnant women, whose prevalence of maternal stress was 26.7%. Financial constraints were reported to be the cause of maternal stress for 17 (56.7%) of the study sample. The majority of pregnant women, 19 (63.3%) reported adopting the avoidant ways of coping. This available evidence provides rationale for conduction studies on a larger scale with a view of equipping women with more effective strategies to reduce maternal stress.

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