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Research Article

**PREVALENCE OF PRE-ECLAMPSIA AND ITS ASSOCIATION  
WITH BODY MASS INDEX IN WOMEN**Dr Tahira Bashir<sup>1</sup>, Dr Hina Shahab<sup>2</sup>, Dr Amber Farid Awan<sup>3</sup><sup>1</sup>WMO in RHC Dijkot, <sup>2</sup>WMO at DHQ NAROWAL, <sup>3</sup>WMO at THQ Muridkey.

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**Abstract:**

**Introduction:** Preeclampsia is a serious complication affecting 2-8% of all pregnancies. Globally, more than 287,000 women die each year due to pregnancy related causes, of which 10-15% are estimated to be due to preeclampsia.

**Objectives of the study:** The main objective of the study is to analyze the prevalence of pre-eclampsia and its association with body mass index in women.

**Methodology of the study:** This cross sectional study was conducted in RHC Dijkot and DHQ Narowal during April 2018 to December 2018. This study was done with the permission of ethical committee of hospital. The data was collected from 200 female patients and they visit the OPD of the hospital regularly. The data was collected through a systematically designed questionnaire. BMI (weight (kg)/height (m)<sup>2</sup>) was calculated and categorized into underweight, normal, overweight, obese class I and obese class II-III according to the definitions of the World Health Organization.

**Results:** The data were collected from 200 females, overall pre pregnancy mean BMI was 23.5, 6.6% were births to underweight mothers, 62.1% to normal weight mothers, 24.0% to overweight mothers and 7.3% to obese mothers. The highest mean BMI and highest proportion with obesity were found among women above 35 years of age, women who had the highest education, women with missing information on marital status, business or professional women, women from the Chagga tribe, and women with four or more ANC visits. Differences in mean BMI were modest, and only among mothers above 35 years of age was mean BMI above 25.

**Conclusion:** It is concluded that increasing prevalence of obesity in pre pregnant women in low income countries hinders efforts to improve perinatal health and reduce maternal mortality.

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**INTRODUCTION:**

Preeclampsia is a serious complication affecting 2-8% of all pregnancies. Globally, more than 287,000 women die each year due to pregnancy related causes, of which 10-15% are estimated to be due to preeclampsia. Most maternal deaths occur in developing countries. Millennium Development Goal number five is to reduce maternal mortality by three quarters by 2015 [1]. Given the high number of maternal deaths in low income countries due to preeclampsia, both prevention of preeclampsia and optimal management of preeclamptic pregnancies are important to further reduce maternal mortality.

The etiology of preeclampsia remains unclear, but mechanisms related to the placenta, genes, immune response, insulin resistance, and maternal vascular disease are suggested to contribute [2]. Established risk factors for preeclampsia include nulliparity, advanced maternal age, overweight/obesity, chronic hypertension, diabetes, previous preeclampsia, family history of preeclampsia, long time since previous pregnancy, and multiple pregnancy [3]. Obesity has been associated with a 2-4 fold increased risk of preeclampsia in different populations, and is a leading identified attributable risk for this disorder. A population based study from Dar Es Salaam, Tanzania, reported that the prevalence of obesity among women of reproductive age increased progressively from 3.6% in 1995 to 9.1% in 2004 [4]. The Tanzanian Demographic Health Survey for the years 2004 and 2005 reported a prevalence of 13% and 4%, respectively of overweight and obesity among women of reproductive age [5].

Preeclampsia is commonly defined as hypertension after 20 gestational weeks combined with proteinuria. Maternal metabolic risk factors are known to increase the risk of both early- and late-onset preeclampsia, but there are also differences between the two subgroups. Early-onset preeclampsia is believed to be more of a placental disease and thus more dependent on underlying abnormal placentation, while late-onset preeclampsia is thought to be a mainly maternal metabolic disease [6]. Especially, early-onset preeclampsia is a leading cause of morbidity and mortality among mothers and infants, due to increased

risks of maternal cardiovascular complications, intrauterine growth restriction and preterm birth [7].

**Objectives of the study:**

The main objective of the study is to analyze the prevalence of pre-eclampsia and its association with body mass index in women.

**Methodology of the study:**

This cross sectional study was conducted in RHC Dijkot and DHQ Narowal during April 2018 to December 2018. This study was done with the permission of ethical committee of hospital. The data was collected from 200 female patients and they visit the OPD of the hospital regularly. The data was collected through a systematically designed questionnaire. BMI (weight (kg)/height (m)<sup>2</sup>) was calculated and categorized into underweight ( $\leq 18.4$ ); normal (18.5–24.9); overweight (25.0–29.9); obese class I (30.0–34.9); and obese class II–III ( $\geq 35.0$ ) according to the definitions of the World Health Organization. We used information on family situation, smoking habits, and chronic diseases from the first antenatal visit. This information is recorded in a standardized manner, with check boxes. Family situation is categorized into living or not living with the infant's father, and smoking habits into nonsmoker, light smoker and heavy smoker.

**Statistical analysis:**

The data were collected and analyzed using SPSS version 19.0. All the values were expressed in mean and standard deviation.

**RESULTS:**

The data were collected from 200 females, overall pre pregnancy mean BMI was 23.5, 6.6% were births to underweight mothers, 62.1% to normal weight mothers, 24.0% to overweight mothers and 7.3% to obese mothers. The highest mean BMI and highest proportion with obesity were found among women above 35 years of age, women who had the highest education, women with missing information on marital status, business or professional women, women from the Chagga tribe, and women with four or more ANC visits. Differences in mean BMI were modest, and only among mothers above 35 years of age was mean BMI above 25.

**Table 01:** Demographic characteristic of selected female participants (n=200)

Characteristics	Mean (SD) BMI	BMI < 18.5 Underweight	BMI 18.5-24.9 Normal	BMI 25.0-29.9 Overweight	BMI >= 30 Obese	p-value
%	23.5	6.6	62.1	24.0	7.3	
Mothers age (yrs)						<0.001
13-19	21.8 (3.2)	12.6	72.1	13.5	1.8	
20-24	22.8 (3.6)	7.9	68.3	19.5	4.3	
25-29	24.0 (4.0)	5.1	58.3	27.7	8.9	
30-34	24.9 (4.2)	3.2	51.0	33.0	12.9	
35-50	25.6 (4.4)	2.9	46.5	33.8	16.8	
Missing	23.9 (3.6)	-	64.7	23.5	8.8	
Mothers education						<0.001
None	22.8 (3.3)	9.0	69.5	18.1	3.4	
Primary	23.2 (3.8)	7.2	75.5	21.4	6.0	
Secondary (8-11 yrs)	23.2 (4.0)	8.7	62.6	23.1	6.7	
Higher (12+ yrs)	24.0 (4.1)	5.6	57.6	27.6	9.1	
Missing	23.5 (3.4)	11.5	73.1	15.4	-	

**DISCUSSION:**

There was a positive association between increasing pre pregnancy body mass index and the risk of developing preeclampsia, amounting to an adjusted odds ratio of 1.8 for obese women with BMI above 30 as compared to normal weight women with BMI between 20 and 24.9. Among the maternal characteristics included in our analysis, only maternal age above 35 years of age showed a higher odds ratio. Our findings are in line with previous studies based on populations of pregnant women in high income countries [8].

Using the WHO definition of overweight and obesity, the prevalence of pre pregnancy overweight and obesity in our study population of ethnic African women was 24.0% and 7.3%, respectively. This compares with a study from Dar Es Salaam, where prevalence of obesity among females of reproductive age increased from 3.6% in 1995 to 9.1% in 2004. Our results, with nearly one third of the women were overweight or obese, correspond with global numbers of obesity, showing that obesity has now become a significant health challenge also in many low income countries [9].

In our data, being overweight and obese was associated with higher maternal age, being married, high education, and being from the Chagga tribe, the majority tribe in the area [7]. This indicates that overweight and obesity in this population are associated with higher socioeconomic status rather than low socioeconomic status which is the case in resource rich countries. In our study, adjustment for socioeconomic factors had, however, little influence

on the effect of BMI. Socioeconomic factors are not among major risk factors of preeclampsia, and, although associated with BMI, are therefore not likely important confounders [10].

**CONCLUSION:**

It is concluded that increasing prevalence of obesity in pre pregnant women in low income countries hinders efforts to improve perinatal health and reduce maternal mortality. There appears to be an association between increased pre pregnancy body mass index category and increased preeclampsia risk, in this resource limited population.

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