UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Gestational Weight Gain in Central Ethiopia: Patterns, Predictors, Birth Weight, Women's and Care Providers' Views. A Mixed Method Study

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Certificate of Original Authorship

I, Fekede Kumsa, declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy degree, in the Faculty of Health at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis. This document has not been submitted for qualifications at any other academic institution.

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List of Publications Included as Part of the Thesis

1. Asefa F, Cummins A, Dessie Y, Hayen A, Foureur M: Gestational weight gain and its effect on birth outcomes in sub-Saharan Africa: Systematic review and meta-analysis. PLoS One. 2020; 15 (4):1-23.
2. Asefa F, Cummins A, Dessie Y, Foureur M, Hayen A: Patterns and Predictors of Gestational Weight Gain in Central Ethiopia: A Prospective Cohort Study. Reproductive Health. 2021; 18(1): 1-14
3. Asefa F, Cummins A, Dessie Y, Foureur M, Hayen A: Influence of Gestational Weight Gain on baby's' Birth Weight in Central Ethiopia (Under review in BMJ Open)
4. Asefa F, Cummins A, Dessie Y, Foureur M, Hayen A: Gestational Weight Gain and Postpartum Weight Retention in Central Ethiopia: A Qualitative Study Describing Pregnant Women's Perspectives. Midwifery (will be submitted soon)
5. Asefa F, Cummins A, Dessie Y, Foureur M, Hayen A. Midwives' and Obstetricians' Perspectives about Pregnancy Related Weight Management in Ethiopia: A Qualitative Study. PLoS One. 2020;15 (12):1-23

Abbreviations and Acronyms

AJOL	African Journal Online
ANC	Antenatal Care
BMI	Body Mass Index
CI	Confidence Interval
CINAHL	Cumulative Index of Nursing and Allied Health Literature
EDHS	Ethiopian Demographic and Health Survey
EPDS	Edinburgh Postnatal Depression Scale
GWG	Gestational Weight Gain
HFAIS	Household Food Insecurity Access Scale
HREC	Human Research Ethics Committee
IHRERC	Institutional Health Research Ethics Review Committee
IOM	Institute of Medicine
IPAQ	International Physical Activity Questionnaire
IQR	Interquartile Range
IUGR	Intra Uterine Growth Retardation
LBW	Low Birth Weight
MDD-W	Minimum Dietary Diversity-Women
MET	Metabolic Equivalent Task
MUAC	Mid-Upper Arm Circumference
OR	Odds Ratio
PPD	Postpartum Depression
PPWR	Postpartum Weight Retention
PRISM-P	Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols
RR	Relative Risk
SD	Standard Deviation
SGA	Small for Gestational Age
SSA	sub-Saharan Africa
USA	United States of America
USD	United States Dollar
UTS	University of Technology Sydney
VIF	Variance Inflation Factor
WHO	World Health Organization

Table of content

List of Tables

List of Figures

Abstract

Background: Adequate weight gain is needed to support a number of physiological changes during pregnancy. Gaining inadequate or excess gestational weight poses a health risk to the mother and baby. Inadequate gestational weight gain (GWG) increases the risk of fetal growth restriction, pre-term birth, and low birth weight. In contrast, women who gain excessive gestational weight are at an increased risk of hypertension in pregnancy, caesarean sections, postpartum weight retention, and development of long-term obesity. Given the scarcity of evidence that focuses on GWG in low-income countries including Ethiopia, it is necessary to undertake studies to understand the issue.

Aim: The aim of this study was to assess GWG status of the women, and examine the effect of GWG on a baby's birth weight, and explore pregnant women's and care providers' views on GWG in Central Ethiopia

Method: A concurrent mixed method study was carried out in 16 public health facilities (four tertiary hospitals and 12 health centres) in Addis Ababa, Ethiopia. A total of 395 pregnant women enrolled into the quantitative study before or at 16 weeks of gestation and were prospectively followed until they gave birth. Eight focus group discussions with pregnant women, and 36 in-depth interviews (15 with pregnant women, 11 with midwives and 10 with obstetricians) were conducted. The quantitative data were analysed using multinomial logistic regression and linear regression. The qualitative data were analysed using thematic analyses.

Results: Of the total of 395 pregnant women enrolled into the quantitative study, GWG was assessed for 369 (93%) women. More than two thirds of the pregnant women (67.2%) gained

inadequate gestational weight. Pre-pregnancy weight and employment status were statistically significant predictors of GWG. Infants whose mothers had inadequate weight gain were 245.8 gm lighter compared to those who gained adequate weight. Almost all pregnant women, midwives and obstetricians had limited knowledge of the recommended amount of GWG. Counselling about GWG and postpartum weight was lacking. Midwives and obstetricians did not consider gestational weight gain counselling as a priority issue. Most pregnant women did not want to gain weight during pregnancy; but did want to gain weight after birth.

Conclusions: Inadequate GWG and women's widespread misconception about GWG is a public health concern in Ethiopia. The limited knowledge of and low attention to pregnancy related weight management by midwives and obstetricians in Ethiopia needs appropriate intervention. Adapting a guideline for pregnancy weight management and integrating it into antenatal care is essential.