

**Periodontal Disease during Pregnancy
and Low Birth Weight of Newborns
at Chris Hani District of Eastern Cape**

by

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DECLARATION

I hereby declare that every aspect of this dissertation entitled *Periodontal disease during pregnancy and low birth weight of newborns at Chris Hani district of Eastern Cape* was undertaken by me. It has not been submitted for any degree or examination in any university, and all the resource materials used and/or quoted have been duly acknowledged.



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DEDICATION

This dissertation is dedicated to the memory of my parents;
Mr J.A. Agbeniyi and Mrs E.O. Agbeniyi,
in deep gratitude for giving me
a formal, moral and spiritual education.

ACKNOWLEDGEMENTS

I thank God Almighty, the pioneer and perfecter of life, for helping me from the beginning to the end of this dissertation.

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I would like to express my appreciation to Gugulethu, my darling wife, and to my angelic daughters, Olukemi and Folasade, for keeping the family going as a unit during my absence from home, especially during my data collection in the Eastern Cape, and for their continued prayers for a successful research outcome.

Finally, I would like to thank Dr Bukola Olutola for her time and support during my studies.

ABSTRACT

Objective: This study sought to determine the association between periodontal disease in pregnancy and the delivery of low birth weight newborns in a rural population of South African women.

Methods: This case-control study involved 348 new mothers. All subjects were recruited post-delivery from three public hospitals in the rural Eastern Cape of South Africa. The cases (n=119) were mothers who delivered through normal delivery and whose babies at the time of delivery weighed <2.5 kg. Age-matched controls (n=229) were mothers who delivered ≥ 2.5 kg babies. Potential risk factors for periodontal disease and low birth weight were collected by means of a structured questionnaire and maternity record review. Using the WHO's community periodontal index, a trained dental clinician blinded to participants' birth-outcomes recorded the periodontal health status of each participant (intra-examiner reliability; kappa = 0.95). Mothers who presented with a probing depth ≥ 4 mm on more than four index teeth without the presence of gingival overgrowth were deemed to present with periodontal disease. Data analysis included conditional logistic regression analysis.

Results: Periodontal disease was diagnosed in 37.9% (n=45) of the case group and 9.2% (n=21) of the control group. Low birth weight was also significantly more common among those who were unemployed, those who reported fewer than three antenatal visits and drinking on five or more days per week during pregnancy. After controlling for potential confounders, mothers presenting with a probing depth of ≥ 4 mm on four teeth (OR = 4.12; 95% CI = 1.78 - 9.50) or more than four teeth (OR = 4.95; 95% CI: 1.52 – 15.81) were found to be significantly more likely to have low birth weight babies.

Conclusions: The study findings suggest that there is a significant dose-dependent positive association between periodontal disease and low birth weight, independent of other risk factors measured in this study.

Keywords: Periodontal disease, Low birth weight, Pregnancy, South Africa, Case, Control, Probing depth, Maternity record, Questionnaire, Community periodontal index.

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LIST OF ABBREVIATIONS

CI	Confidence interval
CPI	Community periodontal index
DNA	Deoxyribonucleic acid
DOH	Department of Health
GCF	Gingival crevicular fluid
HIV/AIDS	Human immunodeficiency virus/Acquired immunodeficiency syndrome
IVH	Intravascular haemorrhage (bleeding in the brain)
MCH	Maternal and child health
MDG	Millennium development goal
MMP	Matrix metalloproteinase
NEC	Necrotizing enterocolitis
OR	Odds ratio
PD	Periodontal disease
PDA	Patent ductus arteriosus
PGE₂	Prostaglandin E ₂
RDS	Respiratory distress syndrome
ROP	Retinopathy of prematurity
TNF	Tumour necrotic factors
WHO	World Health Organization