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The association between breastfeeding duration and adiposity using waist-to-hip ratio and mid-upper arm circumference in South African children aged between one and five years

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According to WHO estimates, in 2022, over 37 million children aged five and younger were overweight[1]. Emerging evidence is linking excessive weight gain before the age of 3 years with later cardiometabolic risks[2]. Breastfeeding has been reported to be protective against early obesity in children between 2 and 6 years of age[3]. Additionally, breastfeeding infants reduces rapid weight gain at the end of infancy[4]. Waist-to-hip ratio (WHR) and mid-upper-arm circumference (MUAC) are cost-effective methods of measuring adiposity distribution. Studies employing these methods in children, particularly in South Africa (SA) are lacking. This study investigates the association between the duration of breastfeeding and WHR and MUAC among a small South African cohort.

A cross-sectional study consisting of 262 Black African children aged 1-to-5 years of age was conducted. Children were recruited from local SA clinics via the convenience sampling technique during routine immunisation clinic visits. Data were analysed using R (R-core team 2022) & SPSSVS28 (IBM 2021). The London Metropolitan University sub-ethics committee, the Durban University of Technology (SA University) and the KwaZulu-Natal Department of Health granted ethics for the study. The relevant authorities granted gatekeeper permission from all the facilities before the commencement of data collection. Participants gave informed consent in the local language and were made aware that they could withdraw at any time without any consequences. The waist and hip circumference in centimetres were measured using anthropometric tape, WHT was then calculated by dividing the waist circumference by the Hip circumference. The MUAC was measured using a MUAC tape. The measurements were taken by trained personnel Duration of breastfeeding (weeks) was used as the outcome variable and the WHR and (MUAC) were used as predictor variables. Pearson's correlation test was used to measure the relationship between the predictor variables. A p-value of <0.05 was considered significant.

Of the total 262 children that participated in our study, 50.5% were male while 49.5% were female. The average age of the participants was three years. Our data (both WHR & MUAC) was normally distributed according to the generalised linear model. The minimum breastfeeding duration was zero weeks while the maximum duration was 104 weeks (24 months). The mean waist-to-hip ratio was 0.9143, while the mean MUAC was 16.13cm. According to the Pearson correlation test, breastfeeding duration is negatively associated with both WHR ($r = -0.18$, $p < 0.768$) and MUAC ($r = 0.17$ $p < 0.790$), but this association is not statistically significant.

Increasing breastfeeding duration was weakly associated with a decrease in both WHR and MUAC. In our study, although there is a trend in the correlation between breastfeeding duration, WHR and MUAC, the relationship between these predictors is not significant. Further studies, with larger samples, are needed to validate these findings.

References

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