

The impact and effect modification of BMI and HIV on Body Image outcomes among pregnant women living in South Africa



SCAN ME

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In pregnancy, higher BMI is strongly associated with increasing desire to be a smaller body size, but HIV status has minimal influence.

INTRODUCTION

- While obesity during pregnancy has been linked to poorer body image, no research has examined how the co-occurrence of obesity and HIV infection impacts body image during pregnancy.
- This is a critical gap in South Africa, as women of childbearing age face a double burden of high obesity and HIV rates.
- This study assessed the impact and effect modification of BMI and HIV on body image during pregnancy.

METHODOLOGY

- We conducted a cross-sectional analysis using data from 1763 pregnant women enrolled in the Obesogenic Origins of maternal and Child metabolic health Involving Dolutegravir (ORCHID) cohort study.
- The ORCHID study follows pregnant women, living with HIV (WLHIV) and HIV-seronegative women, recruited from primary care clinics in Cape Town, South Africa.
- BMI was calculated from measured weight and height.
- Body image outcomes (perceived, ideal, and BID = perceived – ideal) were measured using the Stunkard Figure Rating Scale.

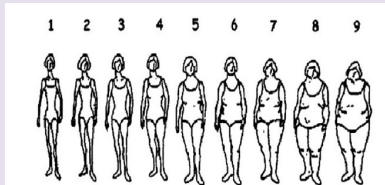


Figure 1. Stunkard figure rating scale silhouettes (Stunkard et al., 1983)

- We used multivariable linear regression, presented as beta estimates (β) with 95% confidence intervals (CIs), to assess associations between BMI/HIV and body image, adjusting for age, parity, and socioeconomic status. Statistical interaction was used to assess effect modification.

RESULTS

Table 1: Participant Characteristics

- Overall, 740 (42%) of women were WLHIV.
- Compared to HIV-seronegative women, WLHIV were older (32 vs 28 years), more often multiparous (74% vs 54%), lower SES and had a lower median BMI at both enrollment and 24-28 weeks' gestation.

Figure 2: Body Image Scores by BMI & HIV Status

- Higher BMI was associated with greater perceived size, ideal size, and BID scores ($p < 0.001$), with differences by HIV status being minimal.

Table 2: Regression Outputs

- Women with BMI $\geq 35\text{kg/m}^2$ had the largest increases in their perceived size, ideal size and BID [Perceived $\beta = 3.20$ (95% CI: 3.05, 3.35); Ideal $\beta = 1.80$ (1.61, 1.97); BID $\beta = 1.40$ (1.24, 1.56)], indicating greater dissatisfaction and stronger desire to be smaller.
- WLHIV had lower perceived size [$\beta = -0.17$ (-0.31, -0.02)] and BID [$\beta = -0.19$ (-0.31, -0.08)] in unadjusted models, these associations were no longer significant after adjustment.
- No effect modification by BMI or HIV status was observed.

RESULTS cont.

Table 1. Maternal baseline characteristics of enrolled participants living with and without HIV at 24–28 weeks' gestation (n = 1763)

Characteristic	Overall, n = 1763	HIV seronegative, n = 1023	Women living with HIV, n = 740	p-value
Median Age (IQR), years	30.00 (26.00, 34.00)	28.00 (25.00, 33.00)	32.00 (27.00, 36.00)	<0.001
Parity, n (%)				<0.001
Nulliparous	659 (37)	468 (46)	191 (26)	
Multiparous	1,104 (63)	555 (54)	549 (74)	
SES tertile, n (%)				<0.001
Lowest	592 (34)	306 (30)	286 (39)	
Middle	583 (33)	334 (33)	249 (34)	
Highest	588 (33)	383 (37)	205 (28)	
Median (IQR) BMI at enrollment (kg/m ²)	29.51 (24.96, 34.73)	29.81 (25.45, 35.42)	29.10 (24.53, 34.27)	0.013
Median (IQR) BMI at 24–28 weeks' gestation (kg/m ²)	30.63 (26.36, 35.68)	31.16 (26.92, 36.24)	30.10 (25.79, 34.90)	0.002

Figure 2. Mean and ± 1 SD error bar plot displaying distribution of body image outcomes (perceived, ideal, and dissatisfaction) scores of enrolled participants, stratified by BMI category and HIV status (n = 1762)

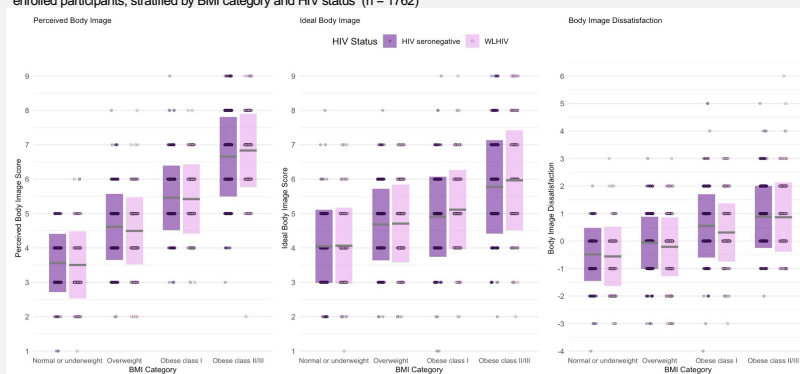


Table 2. Unadjusted and adjusted associations between BMI/HIV and body image outcomes (perceived, ideal, and dissatisfaction) of enrolled participants (n = 1762)

	Perceived		Ideal		Body image dissatisfaction	
	Effect (95% CI)	p-value	Effect (95% CI)	p-value	Effect (95% CI)	p-value
Unadjusted effect						
BMI Normal or underweight (ref)	-	-	-	-	-	-
BMI Overweight	1.03 (0.89, 1.17)	<0.001	0.64 (0.47, 0.81)	<0.001	0.39 (0.24, 0.54)	<0.001
BMI Obese I	1.92 (1.77, 2.07)	<0.001	0.94 (0.77, 1.11)	<0.001	0.97 (0.81, 1.13)	<0.001
BMI Obese II/III	3.20 (3.05, 3.35)	<0.001	1.79 (1.62, 1.96)	<0.001	1.39 (1.24, 1.55)	<0.001
HIV seronegative (ref)	-	-	-	-	-	-
WLHIV	-0.17 (-0.31, -0.02)	0.023	0.03	0.889	-0.19 (-0.31, -0.08)	<0.001
*Adjusted effect						
BMI Normal/underweight (ref)	-	-	-	-	-	-
BMI Overweight	1.03 (0.89, 1.18)	<0.001	0.63 (0.46, 0.81)	<0.001	0.40 (0.24, 0.55)	<0.001
BMI Obese I	1.92 (1.77, 2.07)	<0.001	0.94 (0.76, 1.11)	<0.001	0.98 (0.82, 1.14)	<0.001
BMI Obese II/III	3.20 (3.05, 3.35)	<0.001	1.80 (1.61, 1.97)	<0.001	1.40 (1.24, 1.56)	<0.001
HIV seronegative (ref)	-	-	-	-	-	-
WLHIV	0.02 (-0.08, 0.11)	0.774	0.11 (-0.01, 0.23)	0.074	-0.09 (-0.20, 0.01)	0.086
*Adjusted effect with interaction (BMI categorical)						
Normal/underweight (ref)	-	-	-	-	-	-
Overweight	1.06 (0.87, 1.25)	<0.001	0.63 (0.39, 0.86)	<0.001	0.43 (0.23, 0.64)	<0.001
Obese I	1.91 (1.71, 2.11)	<0.001	0.85 (0.61, 1.09)	<0.001	1.06 (0.85, 1.27)	<0.001
Obese II/III	3.11 (2.92, 3.31)	<0.001	1.72 (1.49, 1.95)	<0.001	1.39 (1.18, 1.60)	<0.001
HIV seronegative (ref)	-	-	-	-	-	-
WLHIV	-0.03 (-0.26, 0.19)	0.774	0.00 (-0.27, 0.28)	0.982	-0.04 (-0.28, 0.21)	0.770
BMI overweight:WLHIV	-0.07 (-0.35, 0.22)	0.648	0.02 (-0.32, 0.36)	0.918	-0.08 (-0.39, 0.22)	0.591
BMI obese:WLHIV	0.02 (-0.27, 0.31)	0.900	0.19 (-0.15, 0.54)	0.276	-0.17 (-0.49, 0.14)	0.272
BMI obese:WLHIV:WLHIV	0.23 (-0.06, 0.52)	0.117	0.18 (-0.17, 0.53)	0.310	0.05 (-0.26, 0.37)	0.740
*Adjusted effect with interaction (BMI continuous)						
BMI:WLHIV	0.01 (-0.00, 0.02)	0.064	0.01 (-0.00, 0.02)	0.286	0.00 (-0.01, 0.02)	0.659

CONCLUSION

- Maternal weight status, not HIV status, was the main driver of body image dissatisfaction during pregnancy.
- To mitigate the risks associated with obesity in pregnancy, future interventions must focus on shifting perceptions around body image in this population and promoting healthier lifestyles in a culturally sensitive and sustainable way.

References

- Stunkard AJ, Sørensen T, Schulsinger F. Use of the Danish Adoption Register for the study of obesity and thinness. Res Publ Assoc Res Nerv Ment Dis. 1983;60:115–20.



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