Can where you live affect your pregnancy?

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SHAPES

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1 | Background

- Maternal adiposity is a measure of the amount of body fat that a person takes into pregnancy.

- Up to 24% of any pregnancy complication could be associated with maternal overweight and obesity (1). BMI is the most commonly used adiposity measure.

- However, BMI may not be the best measure of adiposity. This is important as individuals of recommended BMI may meet high-risk cut-offs on other measures such as waist circumference, but don't receive additional care.

- One study suggests that the greatest rates of antenatal obesity are found among minority ethnic groups, areas of high deprivation and older mothers (2). Variances between these health exposures within the population are indicators of health inequalities.

- Alternative adiposity measures are being introduced for use alongside BMI in clinical practice. Investigating the inequalities linked to these measures could reveal more insights into the causes of maternal health inequalities.

2 | Aims

- Explore the association between maternal adiposity measures and indicators of health inequalities.

- Compare the association between BMI vs other adiposity measures, and indicators of health inequalities.

3 | Methods

- A secondary analysis was carried out on the cohort from Study of How Adiposity in Pregnancy has an Effect on OutcomeS (SHAPES). A total of 1450 women were recruited in the study.

- Exposures of interest were: Maternal Age, Parity, Ethnicity, Smoking Status, Alcohol Consumption and Index of Multiple Deprivation Score (derived from postcode).

- Outcomes of interest were: BMI, Waist Circumference (WC), Waist to Hip Ratio (WHR), Waist to Height Ratio (WHtR), Total Adipose Thickness, Pre-Peritoneal Total Adipose Thickness.

- Pearson's correlation, One way ANOVA and Chi Squared Test of Independence were used to assess the primary association between the categorical exposures and adiposity outcomes. Multiple Linear Regression (MLG) was used to assess the relationship between categorical exposures and BMI, WC, WHR and WHtR.

4 | Results
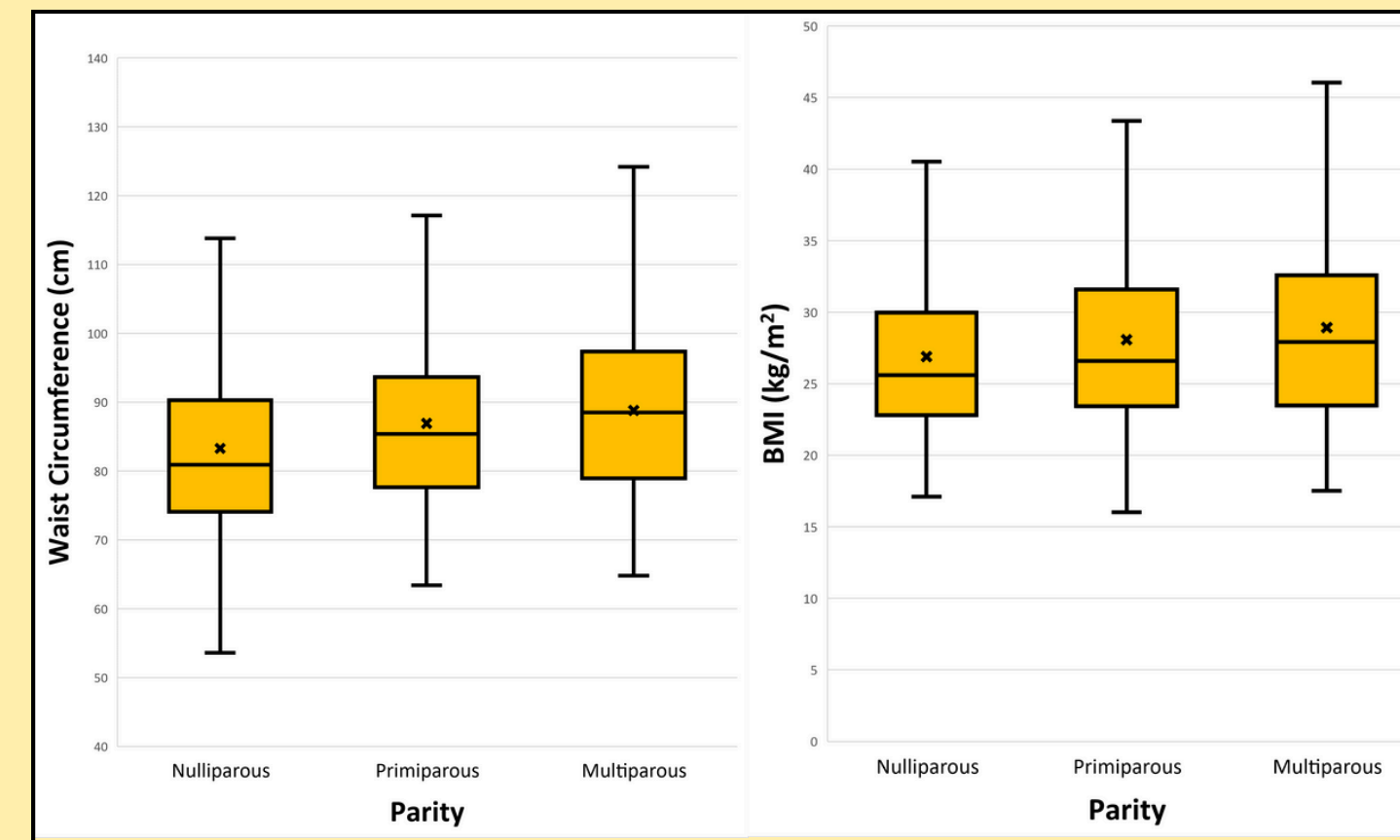
Figure 1- Mean WC and BMI by Parity Categories
Mean WC increased with increase in parity. Nulliparous women had a lower mean waist circumference (83.3 cm) compared to primiparous (86.9 cm) and multiparous women (88.8 cm). In addition, nulliparous women had significantly lower mean BMI (26.9 kg/m2) compared to primiparous (28.1 kg/m2) and multiparous women (28.9 kg/m2).
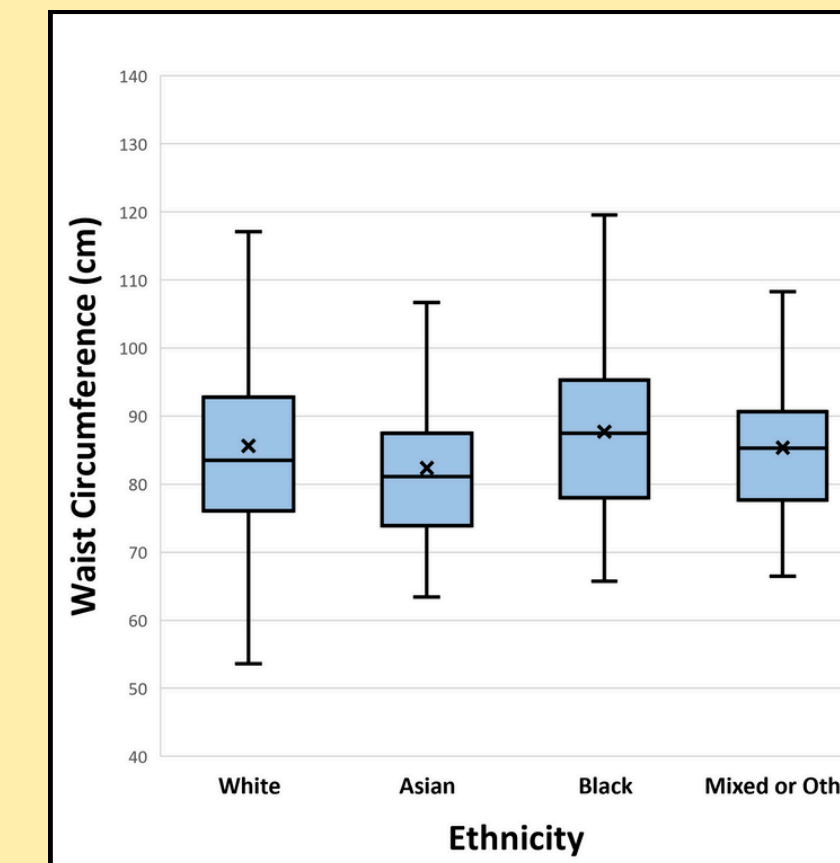
Figure 2- Mean WC by Ethnicity
The mean waist circumference was lower in people of an Asian Background (82.4 cm) compared to White (85.6 cm) or Black Backgrounds (87.7 cm).
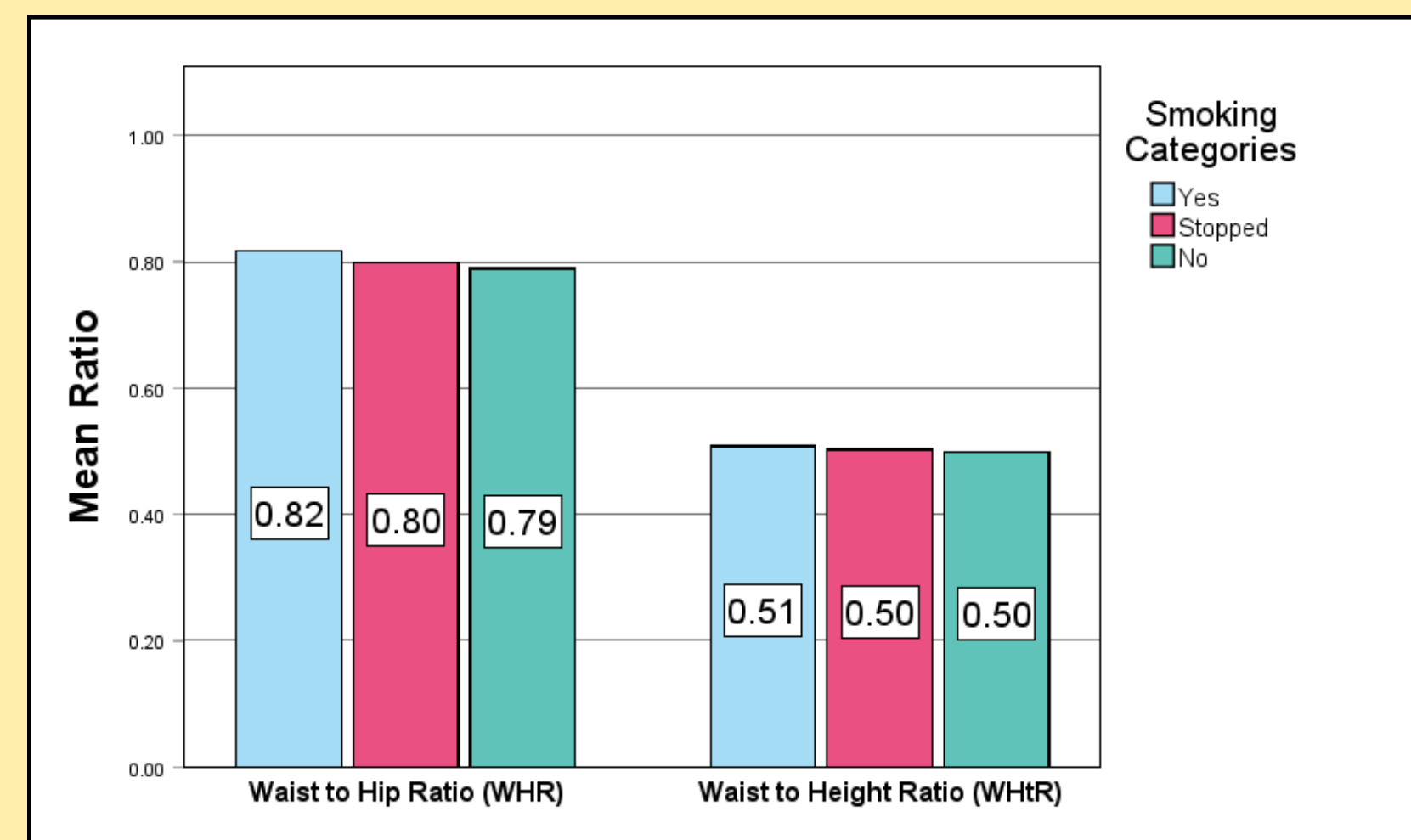
Figure 4- Mean WHR and WHtR by Smoking Status

Smokers had a higher mean WHR (0.82) and WHtR (0.51) compared to non smokers WHR (0.79) and WHtR (0.50) respectively.

Figure 3- Proportions of women in each BMI category by IMD Quintile
Quintile 1- most deprived, Quintile 5- Least deprived

Figure 5- Proportions of women in each Waist to Height Ratio Category by IMD Quintile
<0.50- recommended central adiposity, 0.50-0.59- increased central adiposity, ≥0.60 high central adiposity
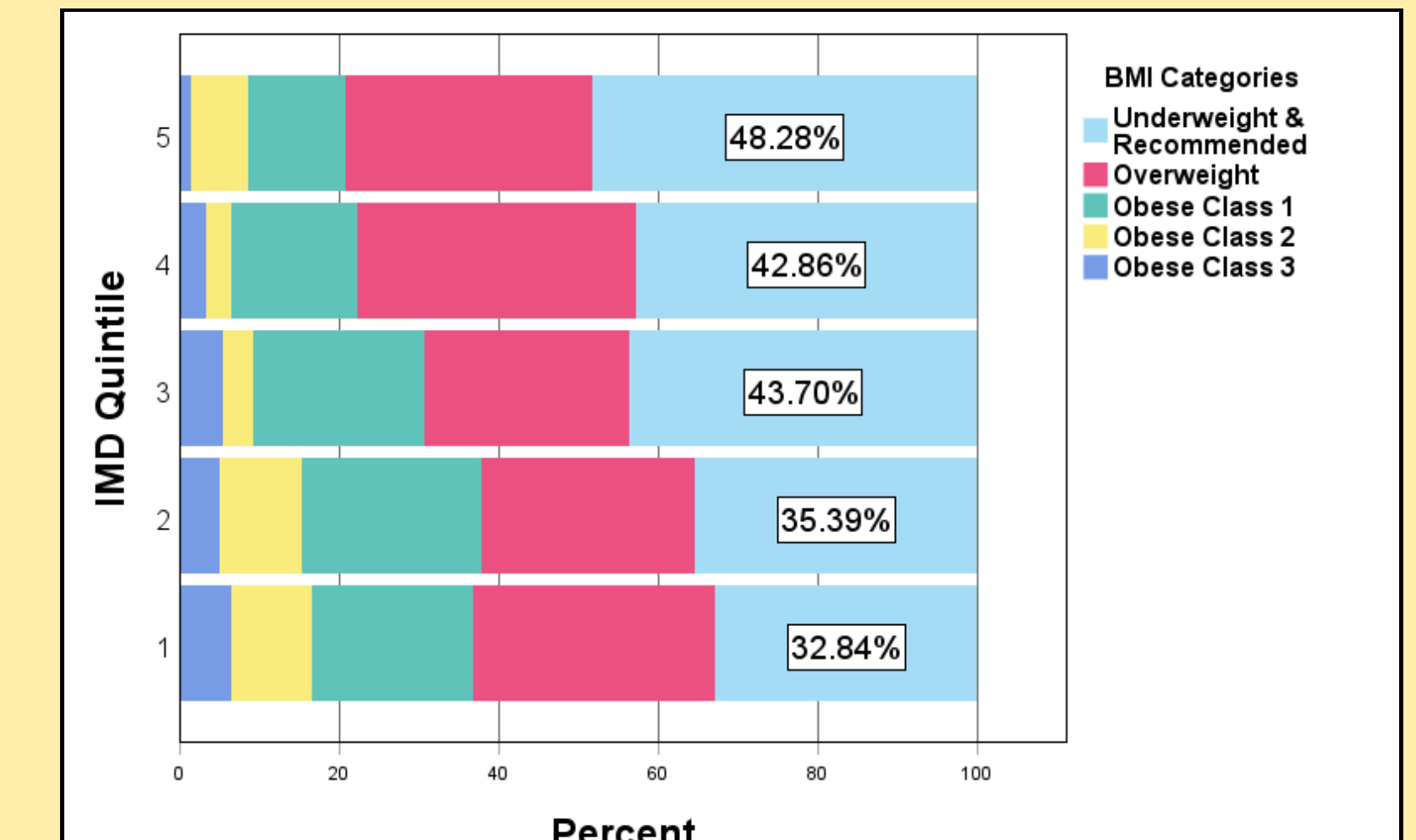

5 | Discussion

Association between maternal adiposity measures and indicators of health inequalities
- Parity, Ethnicity, Smoking, Index of Multiple Deprivation were significantly associated with adiposity measures ($p<0.05$) .
- There was a highly significant association between IMD Quintile and waist to height ratio, ($\chi 2= 27.56$, $p<0.001$). Figure 5 shows that 19% of women in the most deprived IMD Quintile had a WHtR ≥0.60 compared to 7.33% of women in the least deprived quintile.
- Maternal Age and alcohol consumption showed no significant association with adiposity measures.
- In conclusion, women with high adiposity across different measures, were more likely to have higher parity and more deprivation.
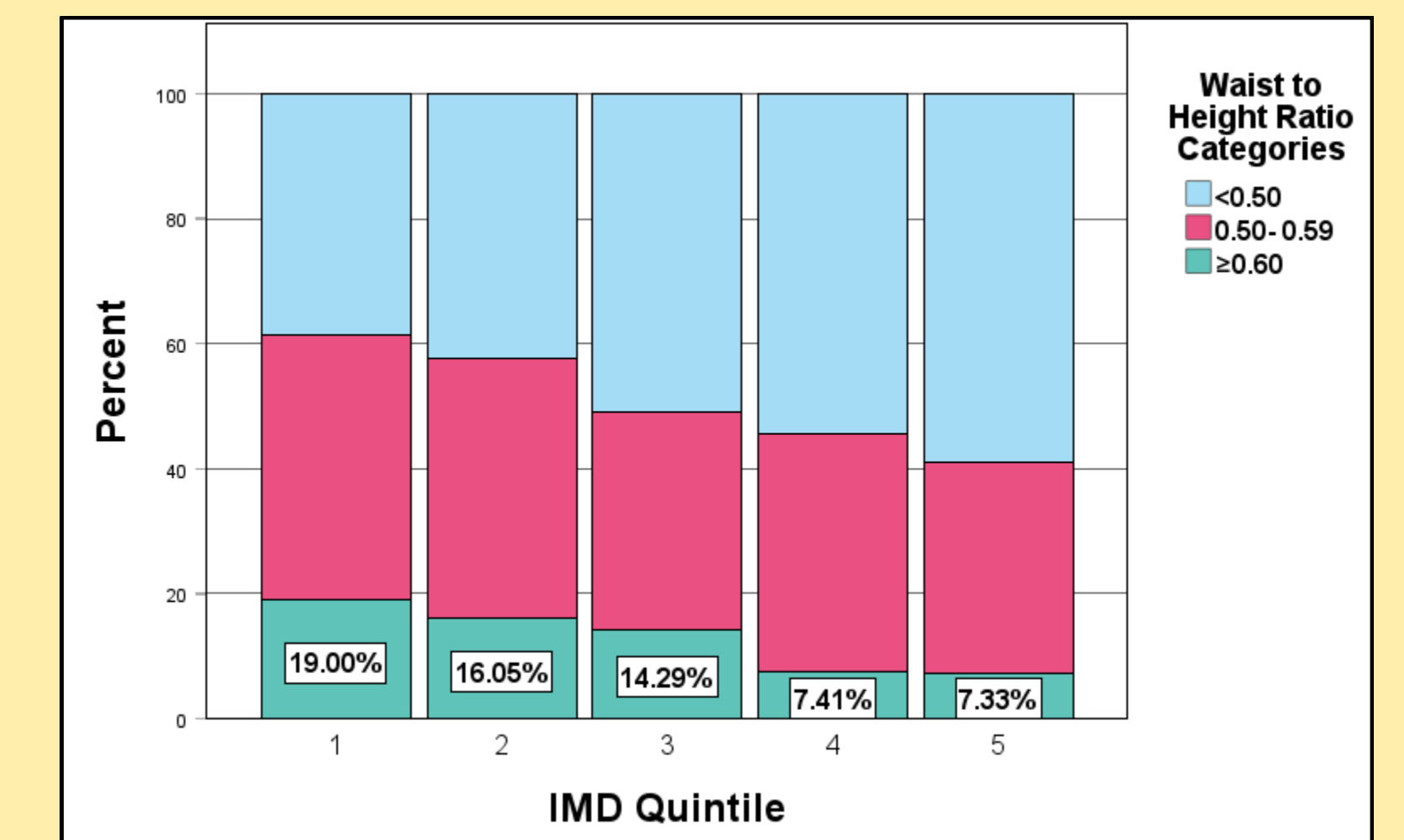
Comparing the association between BMI vs other adiposity measures, and indicators of health inequalities
- Parity and IMD Quintile were significantly associated with both BMI and other adiposity measures.
- Ethnicity showed a significant association with waist circumference (p=0.002) but not BMI (p=0.05).
- Smoking status showed a significant association with WHR (p<0.001) and WHtR (p= 0.02) but not BMI (p=0.31).

References

1. Santos S, Voerman E, Amiano P, Barros H, Beilin L, Bergström A, et al. Impact of maternal body mass index and gestational weight gain on pregnancy complications: an individual participant data meta-analysis of European, North American and Australian cohorts. BJOG: An International Journal of Obstetrics & Gynaecology. 2019;126(8):984-95.
2. Langley-Evans SC, Pearce J, Ellis S. Overweight, obesity and excessive weight gain in pregnancy as risk factors for adverse pregnancy outcomes: A narrative review. Journal of Human Nutrition and Dietetics. 2022;35(2):250-64.

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