

Article

Spousal Obesity Concordance in Male-Headed Cohabiting Couples in Peru: A Cross-Sectional DHS Analysis

Holly E. Delgado-Toro, Jhonatan Cusma-Regalado , Jhosmer Ballena-Caicedo , Kevin Cusma-Regalado, Fiorella E. Zuzunaga-Montoya and Víctor Juan Vera-Ponce *

Facultad de Medicina (FAMED), Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas (UNTRM), Chachapoyas 01001, Amazonas, Peru; 7694394622@untrm.edu.pe (H.E.D.-T.); 7150972322@untrm.edu.pe (J.C.-R.); 7330178022@untrm.edu.pe (J.B.-C.); 7173968722@untrm.edu.pe (K.C.-R.); fiorella.zuzunaga@untrm.edu.pe (F.E.Z.-M.)

* Correspondence: victor.vera@untrm.edu.pe; Tel.: +51-957061401

Abstract

Obesity is a major public health problem in Peru. Cohabiting couples may show obesity clustering because of partner selection, shared household routines, and broader structural exposures. This study aimed to describe spousal similarity in body mass index (BMI) and obesity status among DHS-eligible male-headed cohabiting couples in Peru and to examine variation across sociodemographic subgroups. We conducted a cross-sectional analysis of DHS 2019 and 2021–2024, excluding 2020. The study included heterosexual cohabiting couples in which the man was the household head aged ≥ 18 years and the woman was the spouse/partner aged 15–49 years, with anthropometric measurements available for both. BMI was calculated from measured weight and height; obesity was defined as $\text{BMI} \geq 30 \text{ kg/m}^2$. We accounted for the complex survey design and used Pearson correlations, weighted kappa statistics, and Poisson regression with robust variance to estimate crude and exploratory adjusted prevalence ratios (PRs) for obesity clustering. The final analytic sample included 27,604 couples. Obesity prevalence was 25.8% in husbands and 33.3% in wives. Overall, 52.1% of couples had neither spouse with obesity, 14.5% had only the husband with obesity, 22.0% had only the wife with obesity, and 11.3% had obesity in both spouses. BMI correlation between spouses was $r = 0.19$ (95% CI: 0.18–0.21), the weighted kappa for BMI categories was 0.17, and the crude PR for wife obesity given husband obesity was 1.47 (95% CI: 1.39–1.56). In exploratory adjusted models, the PR for wife obesity given husband obesity was 1.34 (95% CI: 1.26–1.41), and the reverse PR for husband obesity given wife obesity was 1.39 (95% CI: 1.31–1.49). Observed concordance was somewhat stronger in urban, coastal, and wealthier subgroups but remained modest overall. Among DHS-eligible heterosexual cohabiting couples in Peru, restricted to male household heads and female spouses/partners aged 15–49 years, obesity showed positive but modest spousal concordance. These findings support cautious incorporation of couple-level perspectives into obesity surveillance and future research, but they do not establish causal mechanisms or demonstrate the effectiveness of couple-based screening or interventions.

Keywords: obesity; body mass index; spouses; concordance; Peru; cross-sectional study



Academic Editors: Evelyn Nunes Goulart Da Silva Pereira, Rosane Harter Griep and Anissa Daliry

Received: 11 May 2026

Revised: 21 May 2026

Accepted: 23 May 2026

Published: 9 July 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

1. Introduction

Obesity has become a major public health concern in Peru, with recent evidence estimating an adult obesity prevalence of approximately 23.23% when defined by body

mass index (BMI) [1]. This national pattern is consistent with the global increase in obesity observed over recent decades [2]. Elevated BMI contributes substantially to the burden of type 2 diabetes, cardiovascular disease, several cancers, and other chronic conditions, making obesity prevention a major public health priority [3].

Cohabiting couples may share multiple exposures that shape weight status, including household food purchasing, meal preparation, sleep routines, sedentary behaviors, physical activity opportunities, and health-related norms [4]. Spousal similarity in obesity has been hypothesized to arise through at least two broad pathways: assortative mating, in which individuals select partners with similar body size or correlated traits, and shared-environment processes, in which cohabitation may lead to convergence in weight-related behaviors over time [5,6]. Cross-sectional data can document whether such similarity exists, but they cannot determine which of these pathways generated it.

Previous research, conducted mainly in high-income settings, has documented positive but generally modest spousal resemblance for BMI and cardiometabolic risk factors. A meta-analysis of spousal concordance for coronary risk factors estimated an average BMI correlation of 0.15 [7], while studies in the United States and Europe have reported correlations commonly ranging from low to moderate levels [8,9]. More recently, a nationwide study in India found substantial concordance in overweight/obesity, with variation by socioeconomic and residential characteristics [10].

Peru provides an informative context for studying spousal obesity because of its geographic diversity, marked socioeconomic inequalities, and ongoing nutrition transition [11]. These conditions may generate substantial heterogeneity in household food environments, access to preventive care, and exposure to obesogenic settings across regions and socioeconomic groups. However, nationally representative evidence on whether BMI and obesity co-occur within Peruvian couples remains limited. The remaining gap is not only whether obesity is common among adults in Peru, but whether it clusters within cohabiting couples, whether this clustering is modest or substantial, and whether absolute and relative concordance differ across sociodemographic contexts. This study aimed to describe spousal similarity in BMI and obesity status among DHS-eligible cohabiting couples in Peru and to examine how these patterns vary across sociodemographic subgroups.

2. Materials and Methods

2.1. Study Design

This was a cross-sectional analysis of secondary population-based data from Peru's Demographic and Family Health Survey (DHS). We used five annual survey rounds: 2019, 2021, 2022, 2023, and 2024. The 2020 round was excluded because COVID-19 restrictions affected fieldwork operations. The study was descriptive and was not designed to estimate causal effects. Reporting follows the STROBE recommendations for observational cross-sectional studies [12], as shown in Supplementary Text S1.

2.2. Data Source

The DHS is a repeated cross-sectional survey conducted by Peru's National Institute of Statistics and Informatics (INEI), with technical harmonization compatible with Demographic and Health Surveys procedures. The survey uses a complex, multistage, stratified cluster sampling design. Census clusters are selected in the first stage and households in the second stage. The DHS collects household roster data, women's individual questionnaire data, and health-module measurements, including anthropometry in selected household members [13].

2.3. Study Population and Sample

We included households with a complete eligible couple structure, defined as one male household head aged ≥ 18 years and one female spouse/partner aged 15–49 years. We excluded couples in which the female partner was pregnant at the time of measurement, couples in which either spouse had missing or implausible BMI values (<10 or >70 kg/m²), and couples for whom anthropometry could not be linked to the corresponding individual roster line. The final analytic sample included 27,604 cohabiting couples. Weighted estimates should be interpreted as representing eligible cohabiting couples captured by the DHS sampling design and the analytic linkage criteria, rather than all couples in Peru.

2.4. Anthropometry and Individual-Line Linkage

BMI was calculated as weight in kilograms divided by height in meters squared. A key methodological step was individual-line linkage of anthropometry to each spouse. The household roster line (HVIDX) was used to identify the male household head and the female spouse/partner. For men, weight and height were obtained from the health-module selected person using QSNUMERO/QS20C to match the selected anthropometry record to the household roster line. For women, anthropometry was obtained from the women's anthropometry module using HA0, the index to the household schedule, to match HA40 or HA2/HA3 to the spouse's roster line. This linkage avoided assigning anthropometric data from another household member to the spouse. A quality control diagnostic showed residual BMI duplication between spouses at two decimal places in 0.1% of the analytic sample (Supplementary Table S1).

2.5. Variables

Obesity was defined as BMI ≥ 30.0 kg/m². BMI was also categorized into three groups: normal/underweight (<25.0 kg/m²), overweight (25.0–29.9 kg/m²), and obesity (≥ 30.0 kg/m²). Underweight and normal weight were combined because underweight was uncommon and because the main objective was obesity concordance.

Age was recorded in years for each spouse. Age difference was calculated as husband age minus wife age and categorized as wife > 5 years older, wife 1–5 years older, same age, husband 1–5 years older, and husband > 5 years older. Mean couple age was categorized as <30 , 30–39, 40–49, and ≥ 50 years. Educational level was categorized as none/primary, secondary, and higher education. Educational homogamy was defined as both spouses having the same educational category. Household-level variables included wealth quintile, area of residence, natural region, and department.

2.6. Statistical Analysis

All analyses accounted for the DHS complex survey design, including stratification, clustering, and sampling weights. We used the DHS health-module sampling weight for persons aged 15 years or older (PESO15_AMAS), divided by 1,000,000 and pooled across the five survey rounds. Pooled primary sampling units and strata were defined as year-specific cluster and stratum identifiers.

Continuous variables were summarized using weighted means and standard deviations. Categorical variables were summarized using unweighted counts and weighted percentages with 95% confidence intervals (95% CIs). We assessed spousal similarity in continuous BMI using the weighted Pearson correlation coefficient and the linear regression slope of wife's BMI per 1 kg/m² increase in husband's BMI. Agreement across three BMI categories was estimated using weighted kappa with quadratic weights. Confidence intervals for the correlation, regression slope, and kappa were obtained using 500 stratified primary-sampling-unit bootstrap replicates.

In this manuscript, BMI correlation refers to the linear association between spouses' continuous BMI values; BMI category agreement refers to the extent to which spouses fall into the same ordered BMI category beyond chance; and obesity clustering refers to the relative co-occurrence of binary obesity status within couples. These metrics address related but distinct dimensions of spousal similarity and were therefore interpreted separately.

Obesity concordance was described using four mutually exclusive categories: neither spouse with obesity, husband only, wife only, and both spouses with obesity. We estimated crude PRs and 95% CIs using Poisson regression with robust variance, first modeling wife obesity as a function of husband obesity and then husband obesity as a function of wife obesity. Stratified analyses were performed by wealth quintile, area of residence, natural region, age difference, mean couple age, educational homogamy, survey year, and department. To address possible confounding by shared sociodemographic structure, we added an exploratory adjusted sensitivity analysis using Poisson regression with robust variance. These models adjusted for continuous mean couple age, continuous husband-wife age difference, both spouses' educational level, household wealth quintile, area of residence, natural region, and survey year. Adjusted estimates were interpreted descriptively and were not intended to identify causal effects. A sensitivity analysis excluded wives aged 15–17 years because adult BMI thresholds may be less appropriate in adolescents. Analyses were performed using reproducible statistical scripts.

2.7. Ethical Considerations

This study used publicly available, anonymized DHS microdata. The DHS obtains informed consent from participants at the time of data collection. Because this was a secondary analysis of anonymized public-use data with no contact with participants and no possibility of individual identification, additional institutional review board approval was not required.

3. Results

3.1. Participant Flow

Among 724,329 individual records from DHS 2019 and 2021–2024, we identified 79,207 households with one eligible male household head and one eligible female spouse/partner. After excluding pregnant female partners and requiring valid individual-line anthropometry for both spouses and complete analytic variables, the final analytic sample included 27,604 couples (Supplementary Figure S1).

3.2. Sample Characteristics

Table 1 summarizes the characteristics of the analytic sample. The weighted mean age was 38.1 years (SD 9.4) among husbands and 33.6 years (SD 7.8) among wives. Mean BMI was 27.7 kg/m² (SD 4.3) in husbands and 28.4 kg/m² (SD 4.9) in wives. Obesity prevalence was 25.8% among husbands and 33.3% among wives. Most couples lived in urban areas (78.4%), while 33.5% resided in Metropolitan Lima, 25.6% in the rest of the Coast, 25.7% in the Highlands, and 15.1% in the Jungle. Educational homogamy was present in 63.8% of couples.

Table 1. The characteristics of the study population: cohabiting couples in Peru, DHS 2019 and 2021–2024 ($n = 27,604$ couples).

Characteristic	Husbands	Wives
Age, years, mean (SD)	38.1 (9.4)	33.6 (7.8)
BMI, kg/m ² , mean (SD)	27.7 (4.3)	28.4 (4.9)
BMI category, n (weighted %; 95% CI)		
Normal/underweight (<25.0)	9179 (27.8; 27.1–28.6)	7272 (25.0; 24.3–25.8)
Overweight (25.0–29.9)	12,447 (46.3; 45.4–47.2)	11,748 (41.7; 40.7–42.6)
Obesity (≥ 30.0)	5978 (25.8; 25.0–26.7)	8584 (33.3; 32.4–34.2)
Educational level, n (weighted %; 95% CI)		
None/primary	5085 (14.8; 14.2–15.4)	6788 (19.7; 19.1–20.3)
Secondary	13,765 (48.3; 47.4–49.2)	12,782 (45.1; 44.2–46.0)
Higher education	8754 (36.9; 36.0–37.8)	8034 (35.2; 34.3–36.1)
	Couple/household	
Area of residence, n (weighted %; 95% CI)		
Urban	17,080 (78.4; 77.9–78.9)	
Rural	10,524 (21.6; 21.1–22.1)	
Natural region, n (weighted %; 95% CI)		
Metropolitan Lima	2902 (33.5; 32.7–34.4)	
Rest of the Coast	7403 (25.6; 24.9–26.4)	
Highlands	9908 (25.7; 25.0–26.4)	
Jungle	7391 (15.1; 14.6–15.7)	
Wealth quintile, n (weighted %; 95% CI)		
Poorest (Q1)	9395 (21.1; 20.6–21.7)	
Poor (Q2)	7438 (23.2; 22.5–23.9)	
Middle (Q3)	4949 (20.9; 20.1–21.6)	
Rich (Q4)	3552 (19.1; 18.3–20.0)	
Richest (Q5)	2270 (15.6; 14.9–16.4)	
Age difference (husband–wife), n (weighted %; 95% CI)		
Wife > 5 years older	683 (2.3; 2.1–2.6)	
Wife 1–5 years older	3345 (11.9; 11.4–12.5)	
Same age	1963 (7.5; 7.0–8.0)	
Husband 1–5 years older	12,164 (43.0; 42.1–43.9)	
Husband > 5 years older	9449 (35.2; 34.3–36.1)	
Mean couple age, n (weighted %; 95% CI)		
<30 years	7587 (25.6; 24.8–26.4)	
30–39 years	12,660 (41.1; 40.2–42.0)	
40–49 years	6411 (29.2; 28.3–30.1)	
≥ 50 years	946 (4.1; 3.7–4.5)	
Educational homogamy, n (weighted %; 95% CI)		
Heterogamy	10,012 (36.2; 35.3–37.1)	
Homogamy	17,592 (63.8; 62.9–64.7)	

SD = standard deviation; BMI = body mass index; CI = confidence interval. Counts are unweighted. Percentages and means are weighted to account for the complex survey design.

3.3. Overall Spousal Concordance

Table 2 presents overall spousal concordance. BMI correlation between spouses was low but positive ($r = 0.19$; 95% CI: 0.18–0.21). For each 1 kg/m² higher husband BMI, wife BMI was 0.22 kg/m² higher on average (95% CI: 0.20–0.24). The weighted kappa for three BMI categories was 0.17 (95% CI: 0.15–0.19), indicating slight-to-low agreement beyond chance.

Table 2. Overall spousal obesity concordance: cohabiting couples in Peru, DHS 2019 and 2021–2024 ($n = 27,604$ couples).

Indicator	Estimate (95% CI Unless Otherwise Stated)
BMI association	
Pearson correlation coefficient (r)	0.19 (0.18–0.21)
Regression coefficient (wife's BMI per 1 kg/m ² increase in husband's BMI)	0.22 (0.20–0.24)
BMI category agreement	
Weighted kappa (BMI, 3 categories)	0.17 (0.15–0.19)
Obesity concordance	
Neither spouse with obesity	15,565 (52.1; 51.2–53.1)
Husband only	3455 (14.5; 13.9–15.2)
Wife only	6061 (22.0; 21.2–22.8)
Both spouses with obesity	2523 (11.3; 10.6–12.0)
Obesity prevalence in wives	
If husband has obesity, n/N (%)	2523/5978 (43.7)
If husband does not have obesity, n/N (%)	6061/21,626 (29.7)
Prevalence ratio	1.47 (1.39–1.56)
Obesity prevalence in husbands	
If wife has obesity, n/N (%)	2523/8584 (33.9)
If wife does not have obesity, n/N (%)	3455/19,020 (21.8)
Prevalence ratio	1.56 (1.46–1.66)

BMI = body mass index; CI = confidence interval; PR = prevalence ratio. Counts are unweighted. Percentages are weighted. Obesity was defined as BMI ≥ 30 kg/m². PRs in this table are crude and were estimated using Poisson regression with robust variance. In exploratory adjusted models, spousal obesity clustering was attenuated but remained positive after accounting for mean couple age, husband–wife age difference, both spouses' education, household wealth quintile, area of residence, natural region, and survey year. The PR for wife obesity given husband obesity decreased from 1.47 (95% CI: 1.39–1.56) to 1.34 (95% CI: 1.26–1.41), while the reverse PR for husband obesity given wife obesity decreased from 1.56 (95% CI: 1.46–1.66) to 1.39 (95% CI: 1.31–1.49) (Supplementary Table S6).

Regarding obesity status, 52.1% of couples had neither spouse with obesity, 14.5% had only the husband with obesity, 22.0% had only the wife with obesity, and 11.3% had obesity in both spouses. Wives had obesity in 43.7% of couples in which the husband had obesity and in 29.7% of couples in which the husband did not have obesity, corresponding to a PR of 1.47 (95% CI: 1.39–1.56). In the reverse direction, husbands had obesity in 33.9% of couples in which the wife had obesity and in 21.8% of couples in which the wife did not have obesity, corresponding to a PR of 1.56 (95% CI: 1.46–1.66).

3.4. Concordance by Sociodemographic Characteristics

Table 3 shows stratified concordance indicators. The absolute prevalence of obesity in both spouses increased across wealth quintiles, from 3.6% in the poorest quintile to 16.0% in the richest quintile. However, relative spousal concordance was similar across wealth groups, with PRs ranging from 1.34 in the rich quintile to 1.53 in the richest quintile. Rural couples had lower absolute concordant obesity than urban couples (4.2% vs. 13.2%) but a slightly stronger relative association (PR = 1.51 vs. 1.42).

By natural region, concordant obesity was highest in Metropolitan Lima (15.4%) and the rest of the Coast (13.9%) and lowest in the Highlands (5.2%). Relative concordance was modest across all regions, with PRs ranging from 1.28 in the rest of the Coast to 1.51 in the Jungle. By mean couple age, the association was strongest among couples aged < 30 years (PR = 1.79; 95% CI: 1.56–2.06) and weaker among older age groups. Educationally homogamous couples had slightly stronger concordance than heterogamous couples (PR = 1.50 vs. 1.43).

Table 3. Spousal obesity concordance stratified by sociodemographic characteristics: cohabiting couples in Peru, DHS 2019 and 2021–2024 ($n = 27,604$ couples).

Subgroup	<i>n</i>	Both Spouses with Obesity, <i>n</i> (Weighted %; 95% CI)	<i>r</i> (BMI)	PR (95% CI)
Overall	27,604	2523 (11.3; 10.6–12.0)	0.19	1.47 (1.39–1.56)
Wealth quintile				
Poorest (Q1)	9395	321 (3.6; 3.1–4.1)	0.19	1.45 (1.26–1.66)
Poor (Q2)	7438	727 (10.0; 9.0–11.1)	0.19	1.43 (1.29–1.57)
Middle (Q3)	4949	626 (13.7; 12.1–15.3)	0.16	1.44 (1.29–1.61)
Rich (Q4)	3552	495 (14.9; 13.1–16.7)	0.15	1.34 (1.18–1.52)
Richest (Q5)	2270	354 (16.0; 13.8–18.3)	0.2	1.53 (1.30–1.81)
Area of residence				
Urban	17,080	2063 (13.2; 12.4–14.1)	0.18	1.42 (1.33–1.51)
Rural	10,524	460 (4.2; 3.7–4.8)	0.19	1.51 (1.35–1.68)
Natural region				
Metropolitan Lima	2902	401 (15.4; 13.8–17.1)	0.17	1.45 (1.30–1.61)
Rest of the Coast	7403	1098 (13.9; 12.8–14.9)	0.17	1.28 (1.18–1.38)
Highlands	9908	417 (5.2; 4.5–5.8)	0.16	1.47 (1.31–1.64)
Jungle	7391	607 (8.2; 7.4–9.1)	0.19	1.51 (1.37–1.66)
Age difference				
Wife > 5 years older	683	75 (14.6; 9.9–19.3)	0.21	1.65 (1.24–2.21)
Wife 1–5 years older	3345	320 (11.4; 9.7–13.2)	0.23	1.58 (1.35–1.84)
Same age	1963	175 (10.9; 8.6–13.1)	0.21	1.46 (1.17–1.81)
Husband 1–5 years older	12,164	1063 (10.4; 9.5–11.3)	0.2	1.50 (1.37–1.64)
Husband > 5 years older	9449	890 (12.2; 11.0–13.5)	0.17	1.42 (1.30–1.55)
Mean couple age				
<30 years	7587	387 (6.3; 5.4–7.2)	0.21	1.79 (1.56–2.06)
30–39 years	12,660	1189 (11.0; 10.1–11.9)	0.13	1.30 (1.20–1.41)
40–49 years	6411	845 (15.6; 14.2–17.1)	0.18	1.42 (1.29–1.55)
≥50 years	946	102 (14.7; 10.6–18.7)	0.21	1.30 (1.05–1.62)
Educational homogamy				
Heterogamy	10,012	979 (12.4; 11.3–13.5)	0.18	1.43 (1.32–1.56)
Homogamy	17,592	1544 (10.7; 9.9–11.5)	0.2	1.50 (1.39–1.61)

BMI = body mass index; CI = confidence interval; PR = prevalence ratio. Counts are unweighted. Percentages are weighted. PR represents the prevalence of obesity in wives when the husband has obesity compared with when the husband does not have obesity.

3.5. Temporal and Geographic Patterns

Temporal trends are shown in Figure 1 and Supplementary Table S3. The prevalence of obesity in both spouses ranged from 9.7% in 2023 to 12.6% in 2022, while BMI correlations ranged from 0.15 in 2019 to 0.25 in 2022. PRs remained modest over time, ranging from 1.34 in 2023 to 1.60 in 2019. Department-level estimates are shown in Supplementary Table S4. The prevalence of obesity in both spouses ranged from 2.6% in Huancavelica to 21.8% in Moquegua, reflecting marked geographic heterogeneity in absolute obesity burden.

3.6. BMI Category Distribution and Scatterplot

The cross-tabulation of BMI categories between spouses is shown in Supplementary Table S2. Among husbands with obesity, 43.7% of wives also had obesity, compared with 25.2% among husbands with normal/underweight BMI. Figure 2 shows the BMI scatterplot for a random sample of 5000 couples, illustrating a positive but dispersed relationship between spouses' BMI.

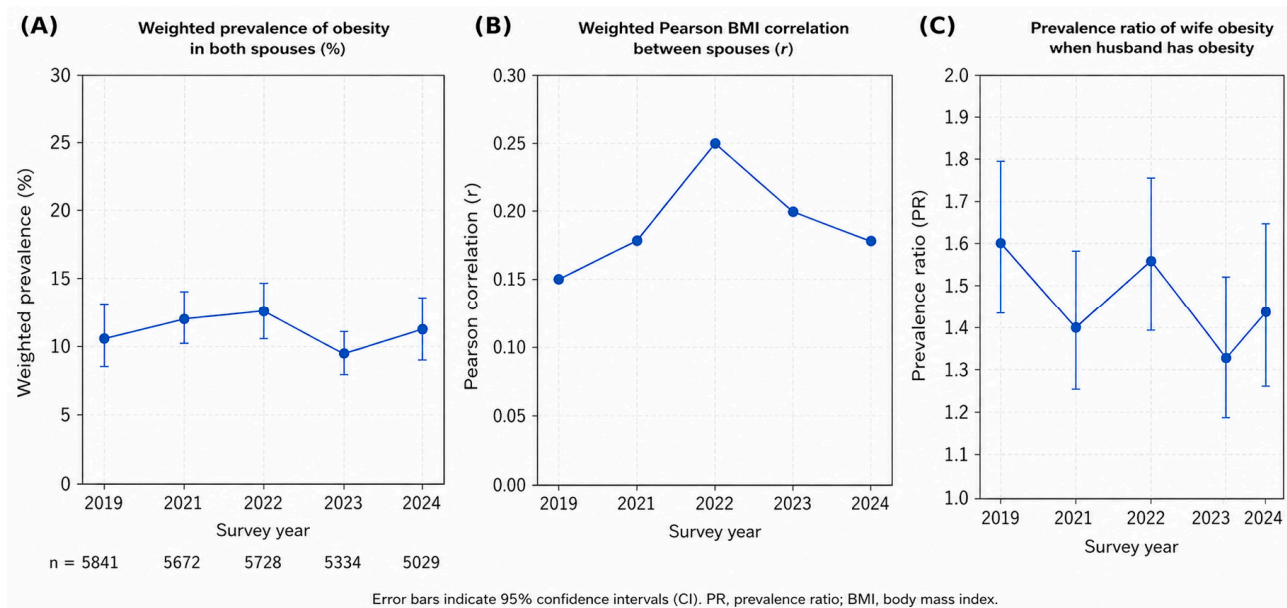


Figure 1. Temporal trends in spousal obesity concordance among cohabiting couples in Peru, DHS 2019 and 2021–2024. **(A)** Prevalence of obesity in both spouses. **(B)** BMI correlation between spouses. **(C)** Prevalence ratio for wife obesity given husband obesity. Error bars represent 95% confidence intervals.

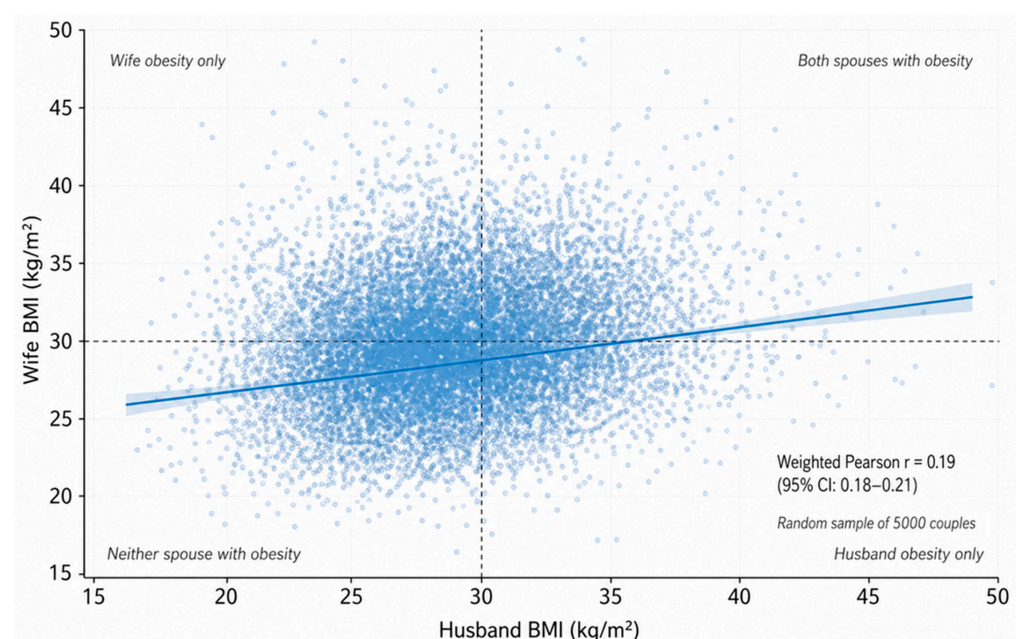


Figure 2. Scatterplot of BMI between spouses in a random sample of 5000 cohabiting couples in Peru, DHS 2019 and 2021–2024. Each dot represents one couple. The blue line represents the fitted trend between husbands' and wives' BMI, and the shaded area represents the 95% confidence band around the fitted line. The vertical and horizontal dashed lines indicate BMI = 30 kg/m². A sensitivity analysis excluding wives aged 15–17 years produced materially unchanged estimates. After this exclusion, the analytic sample included 27,403 couples; BMI correlation remained 0.19, weighted kappa remained 0.17, and the PR for wife obesity given husband obesity was 1.47 (95% CI: 1.39–1.55) (Supplementary Table S5).

4. Discussion

4.1. Key Findings

In this cross-sectional analysis of 27,604 eligible cohabiting couples in Peru, spousal BMI and obesity status showed positive but modest similarity. Each metric captured a different dimension of dyadic similarity. Pearson correlation quantified linear resemblance in continuous BMI and was low. Weighted kappa quantified categorical agreement beyond chance across BMI categories and also indicated limited agreement. The prevalence ratio quantified binary obesity clustering, showing that obesity prevalence in one spouse was approximately 1.5 times higher when the other spouse had obesity. These metrics should not be treated as interchangeable. Exploratory adjusted analyses attenuated but did not eliminate the association, indicating that shared sociodemographic structure explained part, but not all, of the crude clustering. Taken together, these results indicate positive but modest spousal similarity rather than strong concordance.

The absolute burden of obesity differed between spouses: obesity prevalence was higher in wives than in husbands. In addition, concordant obesity was more frequent in urban, coastal, and wealthier contexts, whereas relative concordance was broadly similar across socioeconomic groups and somewhat stronger in rural areas, the Jungle, and younger couples. This distinction between absolute burden and relative clustering is important for interpretation: high-prevalence groups contribute more couples with joint obesity, while relative concordance describes the proportional association between partners.

4.2. Comparison with Previous Studies

The observed BMI correlation of 0.19 is consistent with international evidence showing modest spousal resemblance in BMI. Di Castelnuovo et al. estimated an average spousal BMI correlation of 0.15 in a meta-analysis of major coronary risk factors [7]. Studies in the United States have reported similarly low-to-moderate spousal resemblance, with variation by age, socioeconomic context, and health behaviors [8,9]. Thus, the Peruvian estimates are not anomalously high; rather, they align with the broader literature suggesting that spouses resemble each other in BMI, but only partially.

Our finding that one spouse's obesity is associated with a higher prevalence of obesity in the other spouse is also consistent with longitudinal evidence. In the ARIC cohort, Cobb et al. found that incident obesity in one spouse was associated with higher subsequent obesity risk in the other spouse [9]. However, our study is cross-sectional and cannot determine whether spousal similarity reflects partner selection, convergence during cohabitation, shared household environment, or residual social patterning.

Evidence from other middle-income settings also suggests that household and couple-level contexts are relevant for obesity. A nationwide Indian analysis found substantial concordance in overweight/obesity, with marked socioeconomic and residential variation [10]. In Peru, the combination of urbanization, nutrition transition, and regional heterogeneity may shape the absolute prevalence of joint obesity, even if the relative association between spouses remains modest.

4.3. Interpretive Hypotheses

Several mechanisms are compatible with the observed patterns, but the present study cannot identify them. Assortative mating may lead individuals with similar anthropometric, socioeconomic, or lifestyle profiles to form unions. Shared post-cohabitation environments may also contribute through common meals, household food purchasing, transport patterns, sedentary routines, or exposure to obesogenic settings. In addition, structural factors such as income, food availability, urbanization, and regional dietary practices may influence both spouses simultaneously. Because the data are cross-sectional and lack pre-union

BMI, cohabitation duration, and repeated anthropometric measurements within couples, these mechanisms should be regarded as interpretive hypotheses rather than empirical findings of the present analysis. Distinguishing partner selection from convergence during cohabitation would require longitudinal couple-level data beginning before or early in union formation [14–19].

4.4. Implications

The findings have limited but concrete implications. For surveillance, couple-level summaries may complement individual obesity indicators in household surveys, particularly when anthropometry can be linked reliably within households. For clinical and primary-care practice, obesity identified in one partner may prompt awareness that the other partner could also have elevated BMI; however, given the modest magnitude of concordance, partner assessment should be considered only as an opportunistic complement to routine individual risk assessment, not as a stand-alone screening strategy.

For policy, the higher absolute burden of concordant obesity in urban, coastal, and wealthier contexts suggests that family-oriented prevention approaches could be explored where obesity prevalence is high, while maintaining individual-level prevention across all settings. For research, the next step is not to infer causal household transmission from these data, but to test whether couple- or family-based strategies are feasible, effective, and cost-effective in Peruvian health services. Prior evidence on ripple effects and couple-based lifestyle interventions provides a rationale for such testing [20–22], but the present findings alone do not demonstrate intervention effectiveness.

4.5. Strengths and Limitations

This study has several strengths, including the use of repeated national survey data, measured rather than self-reported anthropometry, explicit accounting for the complex survey design, and individual-line linkage of anthropometric measurements to each spouse. The latter is particularly important in household surveys where anthropometry modules may contain records for selected household members rather than values stored directly on the spouse's roster row.

Several limitations should be considered. First, the sample was restricted to heterosexual cohabiting couples in which the man was the household head and the female partner was aged 15–49 years; the results therefore may not generalize to female-headed households, same-sex couples, male partners who were not coded as household heads, older female partners, or other family structures. Second, valid individual-line anthropometry was required for both spouses, which reduced the analytic sample and may introduce selection bias if couples with missing or unlinked anthropometry differ systematically from included couples. Third, the cross-sectional design prevents causal interpretation and cannot distinguish assortative mating from convergence during cohabitation. Fourth, although an exploratory adjusted sensitivity analysis was added, the adjusted PRs should be interpreted descriptively because residual confounding may remain and the analysis does not identify causal dyadic effects. Fifth, the DHS lacks detailed couple-level measures of shared diet, household food practices, physical activity, sleep, cohabitation duration, and couple relationship dynamics; therefore, the analysis could not assess whether spousal similarity increased with time living together or whether behavioral exposures mediated the observed clustering. Sixth, 2020 was excluded because pandemic-related fieldwork disruptions limit comparability. Finally, BMI does not capture body fat distribution; waist circumference or body composition may show different patterns of spousal similarity.

Because female partners aged 15–17 years were included, adult BMI thresholds may be less appropriate for this small subgroup; adolescent BMI-for-age standards would

be preferred for individuals younger than 18 years [23]. However, sensitivity analysis excluding wives aged 15–17 years produced materially unchanged estimates, suggesting that this issue did not drive the main findings (Supplementary Table S5).

5. Conclusions

Among DHS-eligible heterosexual cohabiting couples in Peru, restricted to male household heads and female spouses/partners aged 15–49 years, obesity showed positive but modest spousal concordance. Approximately one in nine eligible couples had obesity in both spouses, and the crude prevalence of obesity in one spouse was about 1.5 times higher when the other spouse also had obesity. This association was attenuated but remained positive in exploratory adjusted models. These findings support cautious incorporation of couple-level perspectives into obesity surveillance and future research, but they do not establish causal mechanisms or demonstrate the effectiveness of couple-based screening or interventions.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/obesities6040050/s1>, Supplementary Text S1: STROBE checklist for cross-sectional studies; Supplementary Figure S1: Participant selection flow diagram for eligible cohabiting couples in ENDES 2019 and 2021–2024; Supplementary Table S1: Quality-control diagnostics for the corrected analytic sample; Supplementary Table S2: Cross-tabulation of BMI categories between spouses; Supplementary Table S3: Temporal trends in spousal obesity concordance indicators; Supplementary Table S4: Obesity prevalence and spousal obesity concordance by department; Supplementary Table S5: Sensitivity analysis excluding wives aged 15–17 years; Supplementary Table S6: Crude and adjusted prevalence ratios for spousal obesity clustering.

Author Contributions: Conceptualization, V.J.V.-P. and H.E.D.-T.; methodology, V.J.V.-P., H.E.D.-T., J.C.-R., J.B.-C., K.C.-R. and F.E.Z.-M.; software, H.E.D.-T.; formal analysis, H.E.D.-T. and J.B.-C.; investigation, H.E.D.-T., J.C.-R., J.B.-C., K.C.-R., F.E.Z.-M. and V.J.V.-P.; data curation, H.E.D.-T.; writing—original draft preparation, H.E.D.-T., J.C.-R., J.B.-C., K.C.-R., F.E.Z.-M. and V.J.V.-P.; writing—review and editing, H.E.D.-T., J.C.-R., J.B.-C., K.C.-R., F.E.Z.-M. and V.J.V.-P.; visualization, K.C.-R. and F.E.Z.-M.; supervision, V.J.V.-P. and F.E.Z.-M.; project administration, V.J.V.-P.; funding acquisition, V.J.V.-P.; validation, J.B.-C. and F.E.Z.-M.; resources, V.J.V.-P. All authors have read and agreed to the published version of the manuscript.

Funding: Article processing charges, if applicable upon acceptance, will be covered by the Vicerectorado de Investigación of the Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas. Funding number: Not applicable. The funder had no role in the design of the study; in the collection, analysis, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

Institutional Review Board Statement: Ethical review and approval were waived for this study, as it is a secondary analysis of publicly available, anonymized data from the DHS.

Informed Consent Statement: Not applicable. DHS obtains informed consent from participants and releases anonymized public-use datasets.

Data Availability Statement: The data presented in this study are available in the INEI microdata repository at <https://proyectos.inei.gob.pe/microdatos/> (accessed on 24 April 2026).

Acknowledgments: The authors thank the Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas (UNTRM), Amazonas, Peru, for institutional support during the conduct of this research, and the Instituto Nacional de Estadística e Informática (INEI) for making the DHS databases publicly available. The authors used a generative artificial intelligence tool for editorial support during manuscript revision, assistance in organizing responses to peer-review comments, and support in checking statistical scripts. All analyses, interpretations, code outputs, and final manuscript content were reviewed, verified, and approved by the authors. No AI tool was listed as an author.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Vásquez-Romero, L.E.M.; Zuzunaga-Montoya, F.E.; Loayza-Castro, J.A.; Vigil-Ventura, E.; Ramos, W.; Vera-Ponce, V.J. Prevalence of Obesity According to Body Mass Index, Waist Circumference, and Waist-to-Height Ratio in Peru: A Systematic Review and Meta-Analysis. *Obes. Pillars* **2025**, *13*, 100166. [\[CrossRef\]](#) [\[PubMed\]](#)
2. NCD Risk Factor Collaboration (NCD-RisC). Worldwide Trends in Body-Mass Index, Underweight, Overweight, and Obesity from 1975 to 2016: A Pooled Analysis of 2416 Population-Based Measurement Studies in 128.9 Million Children, Adolescents, and Adults. *Lancet* **2017**, *390*, 2627–2642. [\[CrossRef\]](#) [\[PubMed\]](#)
3. World Health Organization. Obesity and Overweight. Available online: <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight> (accessed on 1 February 2026).
4. Meyler, D.; Stimpson, J.P.; Peek, M.K. Health Concordance Within Couples: A Systematic Review. *Soc. Sci. Med.* **2007**, *64*, 2297–2310. [\[CrossRef\]](#)
5. Ajslev, T.A.; Ångquist, L.; Silventoinen, K.; Gamborg, M.; Allison, D.B.; Baker, J.L.; Sørensen, T.I.A. Assortative Marriages by Body Mass Index Have Increased Simultaneously with the Obesity Epidemic. *Front. Genet.* **2012**, *3*, 125. [\[CrossRef\]](#)
6. Wilson, S.J.; Novak, J.R. The Implications of Being “In It Together”: Relationship Satisfaction and Joint Health Behaviors Predict Better Health and Stronger Concordance between Partners. *Ann. Behav. Med.* **2022**, *56*, 1014–1025. [\[CrossRef\]](#)
7. Di Castelnuovo, A.; Quacquarello, G.; Donati, M.B.; de Gaetano, G.; Iacoviello, L. Spousal Concordance for Major Coronary Risk Factors: A Systematic Review and Meta-Analysis. *Am. J. Epidemiol.* **2009**, *169*, 1–8. [\[CrossRef\]](#)
8. Chen, H.J.; Liu, Y.; Wang, Y. Socioeconomic and Demographic Factors for Spousal Resemblance in Obesity Status and Habitual Physical Activity in the United States. *J. Obes.* **2014**, *2014*, 703215. [\[CrossRef\]](#) [\[PubMed\]](#)
9. Cobb, L.K.; McAdams-DeMarco, M.A.; Gudzone, K.A.; Anderson, C.A.M.; Demerath, E.; Woodward, M.; Selvin, E.; Coresh, J. Changes in Body Mass Index and Obesity Risk in Married Couples over 25 Years: The ARIC Cohort Study. *Am. J. Epidemiol.* **2016**, *183*, 435–443. [\[CrossRef\]](#) [\[PubMed\]](#)
10. Singh, P.K.; Singh, L.; Saroj, S.K.; Kumar, C.; Kashyap, S.; Singh, S. Spousal Concordance in Overweight and Obesity Among Indian Couples: A Nationwide Analysis of Socioeconomic and Dietary Determinants. *Curr. Dev. Nutr.* **2025**, *9*, 107489. [\[CrossRef\]](#) [\[PubMed\]](#)
11. Guerra Valencia, J.; Saavedra-Garcia, L.; Vera-Ponce, V.J.; Espinoza-Rojas, R.; Barengo, N.C. Factors Associated with Normal-Weight Abdominal Obesity Phenotype in a Representative Sample of the Peruvian Population: A 4-Year Pooled Cross-Sectional Study. *J. Clin. Med.* **2023**, *12*, 3482. [\[CrossRef\]](#) [\[PubMed\]](#)
12. von Elm, E.; Altman, D.G.; Egger, M.; Pocock, S.J.; Gøtzsche, P.C.; Vandenbroucke, J.P.; STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: Guidelines for Reporting Observational Studies. *Epidemiology* **2007**, *18*, 800–804. [\[CrossRef\]](#) [\[PubMed\]](#)
13. Instituto Nacional de Estadística e Informática (INEI). *Perú: Encuesta Demográfica y de Salud Familiar, ENDES 2024*; INEI: Lima, Peru, 2025.
14. Leong, A.; Rahme, E.; Dasgupta, K. Spousal Diabetes as a Diabetes Risk Factor: A Systematic Review and Meta-Analysis. *BMC Med.* **2014**, *12*, 12. [\[CrossRef\]](#) [\[PubMed\]](#)
15. Kowall, B.; Rathmann, W. Partnership and Marriage and Risk of Type 2 Diabetes: A Narrative Review. *Diabetologia* **2025**, *68*, 704–714. [\[CrossRef\]](#) [\[PubMed\]](#)
16. Goyal, A.; Gupta, Y.; Kalaivani, M.; Sankar, M.J.; Kachhawa, G.; Bhatla, N.; Gupta, N.; Tandon, N. Concordance of Glycaemic and Cardiometabolic Traits between Indian Women with History of Gestational Diabetes Mellitus and Their Spouses: An Opportunity to Target the Household. *Diabetologia* **2019**, *62*, 1357–1365. [\[CrossRef\]](#) [\[PubMed\]](#)
17. Silverman-Retana, O.; Brinkhues, S.; Hulman, A.; Stehouwer, C.D.A.; Dukers-Muijters, N.H.T.M.; Simmons, R.K.; Bosma, H.; Eussen, S.J.P.M.; Koster, A.; Dagnelie, P.C.; et al. Spousal Concordance in Pathophysiological Markers and Risk Factors for Type 2 Diabetes: A Cross-Sectional Analysis of the Maastricht Study. *BMJ Open Diabetes Res. Care* **2021**, *9*, e001879. [\[CrossRef\]](#) [\[PubMed\]](#)
18. Wang, Z.; Ji, W.; Song, Y.; Li, J.; Shen, Y.; Zheng, H.; Ding, Y. Spousal Concordance for Hypertension: A Meta-Analysis of Observational Studies. *J. Clin. Hypertens.* **2017**, *19*, 1088–1095. [\[CrossRef\]](#) [\[PubMed\]](#)
19. Lee, K. Concordance of Characteristics and Metabolic Syndrome in Couples: Insights from a National Survey. *Metab. Syndr. Relat. Disord.* **2024**, *22*, 591–597. [\[CrossRef\]](#) [\[PubMed\]](#)
20. Gorin, A.A.; Wing, R.R.; Fava, J.L.; Jakicic, J.M.; Jeffery, R.; West, D.S.; Brelje, K.; Dillillo, V.G. Weight Loss Treatment Influences Untreated Spouses and the Home Environment: Evidence of a Ripple Effect. *Int. J. Obes.* **2008**, *32*, 1678–1684. [\[CrossRef\]](#) [\[PubMed\]](#)
21. Gorin, A.A.; Lenz, E.M.; Cornelius, T.; Huedo-Medina, T.; Wojtanowski, A.C.; Foster, G.D. Randomized Controlled Trial Examining the Ripple Effect of a Nationally Available Weight Management Program on Untreated Spouses. *Obesity* **2018**, *26*, 499–504. [\[CrossRef\]](#) [\[PubMed\]](#)

22. Arvanitidou, E.I.; Tsofliou, F.; Wood, J.; Tsatsani, I. The Effectiveness of Couples' Lifestyle Interventions on Weight Change: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Nutr. Health* **2025**, *31*, 67–85. [[CrossRef](#)] [[PubMed](#)]
23. World Health Organization. Growth Reference Data for 5–19 Years: BMI-for-Age (5–19 Years). Available online: <https://www.who.int/tools/growth-reference-data-for-5to19-years/indicators/bmi-for-age> (accessed on 18 May 2026).

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.