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Marriage and Its Influence on Overweight and Obesity: Insights from China

Xuejiao Chen[1], Xueqi Hu[2], Songhe Shi[2], Qingfeng Tian[1]*

[1]Department of Social Medicine and Health Management, College of Public Health, Zhengzhou University, Zhengzhou 450001, China.
[2]Department of Epidemiology and Health Statistics, College of Public Health, Zhengzhou University, Zhengzhou 450001, China.

Abstract

The prevalence of overweight and obesity in China is increasing rapidly, making it a pressing issue for academic investigation. This study seeks to assess how marriage influences overweight and obesity among the Chinese population. Data were drawn from the China Family Panel Studies (CFPS), a comprehensive national longitudinal social survey. A total of 44,095 individuals were included in the analysis, utilizing four waves of panel data. Fixed effects regression analysis was employed. Overweight and obesity were classified using BMI thresholds of ≥ 24 kg/m² and ≥ 28 kg/m², respectively. Findings indicate that marriage is associated with a notable rise in the likelihood of being overweight by 6.5% ($p < 0.01$) and obese by 2.8% ($p < 0.01$). A key contributing factor appears to be a decline in exercise habits following marriage, as marriage leads to reduced physical activity while having no statistically significant impact on alcohol consumption. The effect is particularly pronounced among individuals aged 20–30, whereas no significant association is observed for those between 40 and 50 years old. Marriage emerges as a significant socioeconomic determinant contributing to overweight and obesity. There is an urgent need to promote weight management among married individuals, and public health authorities should prioritize improving access to exercise facilities to support this goal.

Keywords: China, Marriage, Overweight, Obesity

Corresponding author: Qingfeng Tian
E-mail: zzutqf@126.com

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Introduction

Adult obesity is on the rise in nearly all regions of the world [1]. As a pressing global health concern, overweight and obesity are linked to cardiovascular conditions, mental health disorders, and certain types of cancer [2, 3]. In China, overweight and obesity are also major public health challenges. According to the "Report on the Status of Nutrition and Chronic Diseases of Chinese Residents (2020)," 34.3% of individuals aged 18 and older are overweight, while 16.4% are obese, translating to roughly 480 million overweight and 230 million obese people. These conditions not only harm physical health and lower subjective well-being [3–5], but also increase the burden on the healthcare system. It is estimated that healthcare expenses related to overweight and obesity account for 2.46% of China's total medical spending [6]. Understanding the underlying causes of overweight and obesity is both academically significant and practically necessary. Various factors contribute to the rise in overweight and obesity, including personal habits, socioeconomic conditions, genetic predispositions, environmental influences, and marital status [5–9]. In a country like China, with a large population affected by

overweight and obesity, it is especially important to explore how marriage may influence body weight.

The relationship between marriage and overweight or obesity remains theoretically ambiguous. According to the marriage protection theory, marriage can enhance health outcomes, as it encourages individuals to adopt healthier behaviors, avoid risky habits, and maintain more consistent eating routines [10]. Some scholars argue that spouses, especially wives, often promote healthier lifestyles in their partners by discouraging harmful habits [11]. Based on this perspective, marriage would not be expected to significantly increase overweight and obesity levels [12]. On the other hand, the marriage market theory and the social obligation theory offer alternative viewpoints. The marriage market theory suggests that unmarried individuals are motivated to manage their weight in order to attract potential partners, as those with lower BMI are generally preferred [13, 14]. Once married, this incentive diminishes, which may result in weight gain and increased rates of overweight and obesity. In a similar vein, the social obligation theory argues that after marriage, people tend to spend more time working to support the household [15], leaving them with less time for physical activity or other weight control efforts—thus raising the likelihood of becoming overweight or obese. Previous research has reported varied findings: some studies have shown that married individuals have lower BMI [16], while others found no significant relationship between marriage and body weight [11]. Nonetheless, the prevailing evidence in developed nations suggests that married individuals are more susceptible to overweight and obesity [17–20]. However, limited research has specifically examined the effect of marriage on overweight and obesity within the context of China.

Investigating the impact of marriage on overweight and obesity in China is a topic of considerable relevance. For many years, hunger was a major public health challenge for Chinese residents. Following the reform and opening-up period, China effectively resolved this issue, but the achievement was soon accompanied by a swift surge in the number of overweight and obese individuals. Consequently, overweight and obesity have now become widespread health concerns in China [21].

In terms of marriage practices, arranged marriage—where parental decisions determined marital partnerships—was a dominant tradition throughout much of China's history. Today, however, free marriage based on personal choice has become the prevailing norm. In this context, managing one's body weight and maintaining a desirable physical appearance plays an important role in attracting a suitable marriage partner. After entering marriage and starting a family, whether individuals are able to maintain control over their weight—and whether this differs between men and women—is a topic worth examining. Moreover, the motivation to marry differs greatly by age group, suggesting that the effect of marriage on overweight and obesity may not be uniform across age ranges. Thus, it is valuable to explore whether the influence of marriage on body weight varies with age.

This study examined how marriage influences overweight and obesity among Chinese adults, and further explored the pathways through which this influence operates—specifically through exercise and alcohol consumption, both of which significantly affect body weight. Additionally, the research assessed whether the effect of marriage on overweight and obesity changes across different age groups.

Materials and Methods

Data

The data employed in this study were drawn from the China Family Panel Studies (CFPS), conducted by the Institute of Social Science Survey (ISSS) at Peking University. The CFPS concentrates on various aspects of the economic and non-economic well-being of Chinese residents, encompassing economic activities, educational attainment, family relationships, population migration, health, and additional factors. The survey sample includes 25 provincial administrative regions, with a target size of 16,000 households.

We utilized data from four waves—2014, 2016, 2018, and 2020—and combined them to create a panel dataset. Specifically, we first loaded the 2014 CFPS data into Stata. Then, using the append command, we sequentially merged the 2016, 2018, and 2020 datasets into the initial file. This process resulted in a panel dataset containing individuals surveyed in all four waves: 2014, 2016, 2018, and 2020. To link the same individuals across different survey waves, Stata's xtset command was applied. In this study, we used the command xtset id year, which enables Stata to internally organize the data by identifying the same individual through the id variable and different waves through the year variable.

We focused on individuals aged 20 to 60 because the legal marriage age in China is 20, and the relatively low number of unmarried people over 60 could bias our regression results. Thus, the analysis was restricted to this age range. Additionally, participants who were divorced, widowed, or had responses such as "cannot judge," "refused to answer," "don't know," or missing data were excluded. The final dataset comprised 44,095 observations.

Measures

Overweight and obesity

BMI was calculated by dividing a person's weight in kilograms by the square of their height in meters. In the CFPS survey, respondents self-reported their height (in

centimeters) and weight (in kilograms). These values were converted to meters and kilograms respectively before calculating BMI. Based on standard thresholds for Asian populations, individuals were classified as overweight if BMI ≥ 24 and obese if BMI ≥ 28.

Marriage

Respondents reported their current marital status in the CFPS, choosing from "unmarried," "married (with a spouse)," "cohabiting," "divorced," or "widowed." For this study, a binary marriage variable was created: individuals reporting "married (with a spouse)" were coded as 1, while those "unmarried" were coded as 0. Respondents who identified as cohabiting, divorced, or widowed were excluded from the analysis. Marital status changes between waves were tracked—if a respondent was unmarried in one wave and married in the next, their Marriage status was updated to 1 accordingly.

Control and mechanism variables

To account for factors that might influence overweight and obesity, we controlled for gender, age, education, income, and whether individuals lived in urban or rural areas. Education was measured by total years of schooling completed. Income referred to the respondent's annual personal income in Yuan, adjusted by the Consumer Price Index (CPI) to reflect real income.

To better understand how marriage affects overweight and obesity, we examined three mediating variables. First, consistent with prior studies showing that drinking and exercise influence body weight [21–23], these behaviors were assessed. Second, the study considered whether marriage impacts time spent on household chores, which could reduce available time for exercise. Regarding drinking, respondents were asked, "Did you drink more than 3 times per week in the past month?" This was coded as a binary variable: 1 if drinking occurred more than three times weekly, 0 otherwise. Exercise was measured by the number of hours spent exercising in the past week, recorded as a continuous variable. Household chores were similarly quantified by the total hours spent on housework during the previous week.

Analytical strategy

To assess the impact of marriage on overweight and obesity, we employed a fixed-effects regression model, as specified in Eq. 1.

$$Y_{it} = \alpha_0 + \beta_1 marriage_{it} + \beta_2 x_{it} + \gamma_t + \mu_i + \lambda_i + \varepsilon_i \quad (1)$$

In this model, α_0 denotes the regression constant. Y_{it} refers to the outcome variables, which include BMI, overweight, and obesity. The variable $marriage_{it}$ represents marital status, taking the value of one if individual i is married at time t, and zero if unmarried. x_{it} is a vector of control variables as described earlier. The coefficient β_1 measures the effect of marriage. γ_t accounts for year effects, μ_i represents individual fixed effects, λ_i captures province-level fixed effects, and ε_i is the error term. Fixed-effects models are appropriate for this analysis, as they effectively control for unobserved, time-invariant characteristics at both the individual and yearly levels [12].

Results and Discussion

Descriptive statistics

Table 1 presents the descriptive statistics based on panel data comprising a total of 44,095 observations. Within this sample, 38.2% of individuals are classified as overweight, while 8.8% fall into the obese category. Additionally, 87.4% of the respondents are reported as married.

Table 1. The description of variables

Variable	Variable define	Mean	S.D.
BMI	Continuous variable	23.223	3.456
Overweight (BMI ≥ 24)	1 = overweight 0 = not overweight	0.382	0.486
Obesity (BMI ≥ 28)	1 = obesity 0 = not obesity	0.088	0.283
Marriage	1 = married 0 = unmarried	0.874	0.332
Gender	1 = male 0 = female	0.476	0.499
Age	Continuous variable	40.482	11.042
Education	Continuous variable	8.999	4.330
Income	Continuous variable (Yuan)	26,155	30,538
Residential location	1 = urban 0 = rural	0.498	0.500
Drink	Drink more than 3 times a week for the past month: 1 = yes 0 = no	0.140	0.347
Exercise	Exercise time in the past week (Hours)	3.252	3.456

Housework	Housework time in the past week (Hours)	1.232	1.872
Observations		44,095	

Figure 1 illustrates the comparison of BMI between married and unmarried individuals in the sample. The BMI distribution among married participants appears more concentrated, whereas the BMI of unmarried individuals shows greater variability. The data also reveal that BMI tends to rise with age, and a consistent difference in BMI exists between married and unmarried groups. Overall, married individuals exhibit a significantly higher BMI than their unmarried counterparts.

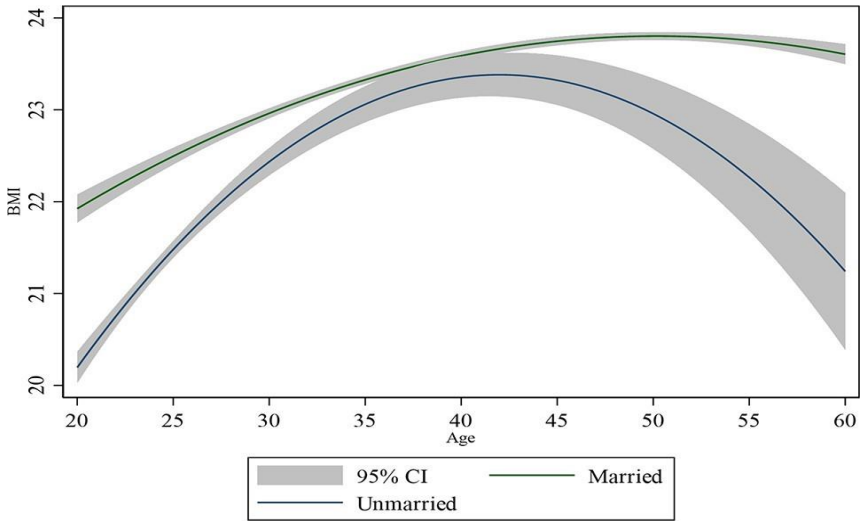

Figure 1. BMI between married and unmarred individuals

Empirical results

The impact of marriage on overweight and obesity is detailed in **Table 2**. The findings indicate that marriage increases the likelihood of being overweight by 6.5 percent ($p < 0.01$) and raises the chance of obesity by 2.8 percent ($p < 0.01$). When examining the probability of being overweight, no notable gender difference was observed. However, the effect of marriage on obesity appears to be more pronounced among women. Specifically, marriage raises the probability of obesity by 2.6 percent ($p < 0.01$) for men and by 3.1 percent ($p < 0.01$) for women. Furthermore, the likelihood of pregnancy rises significantly after marriage, which may contribute to weight gain. To control for this factor, we excluded all individuals who were pregnant during the study period and re-estimated the regression. The results continue to confirm the significant association between marriage and increased risks of overweight and obesity.

Table 2. Effect of marriage on overweight and obesity

	(1)	(2)	(3)	(4)	(5)	(6)
	Overweight	**Overweight (male)**	**Overweight (female)**	**Obesity**	**Obesity (male)**	**Obesity (female)**
Marriage	0.065***	0.065***	0.065***	0.028***	0.026**	0.031***
	(0.011)	(0.016)	(0.015)	(0.007)	(0.010)	(0.009)
Gender	0.125*			0.030		
	(0.075)			(0.047)		(.)
Age	0.012**	0.014***	0.007	-0.004	-0.005	-0.001
	(0.005)	(0.005)	(0.010)	(0.003)	(0.003)	(0.006)
Education	-0.000	0.004	-0.003	0.002	0.002	0.002
	(0.002)	(0.004)	(0.003)	(0.001)	(0.002)	(0.002)
Income	0.000***	0.000***	0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Residential location	0.010	0.037***	-0.013	-0.002	0.001	-0.004

	(0.009)	(0.013)	(0.013)	(0.006)	(0.009)	(0.008)
Cons	-0.223	-0.262	0.014	0.195	0.265*	0.053
	(0.191)	(0.221)	(0.385)	(0.120)	(0.145)	(0.232)
Individual fixed effect	Y	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	Y
Province fixed effect	Y	Y	Y	Y	Y	Y
R2	0.788	0.797	0.776	0.753	0.766	0.735
Observations	44,095	20,948	23,103	44,095	20,948	23,103

Standard errors in parentheses, *p < 0.1, **p < 0.05, ***p < 0.01. This table reports the impact of marriage on overweight and obesity. Overweight is defined as BMI ≥ 24, and obesity is defined as BMI ≥ 28. To obtain robust regression results, individual, year, and provincial fixed effects were controlled

To further explore how marriage contributes to overweight and obesity, we examined changes in behavior following marriage. The findings, presented in **Table 3**, reveal that drinking behavior does not undergo substantial change post-marriage. However, there is a modest reduction in women's drinking habits, significant at the 10% level. This outcome is consistent with real-life observations—after marriage, women are more likely to take on childbearing responsibilities and spend increased time on domestic duties, which may limit their social interactions and reduce alcohol consumption. Notably, marriage leads to a marked decline in the amount of time individuals dedicate to exercise. Among men, marriage reduces weekly exercise time by 59.3% ($p < 0.01$), whereas for women, the reduction is slightly lower at 47% ($p < 0.01$). Thus, a key pathway through which marriage contributes to overweight and obesity is diminished physical activity. Additionally, we assessed the time allocated to household chores, finding a significant increase for women post-marriage, which could displace time for exercise. In contrast, men show no significant change in household chore time after getting married.

Table 3. Mechanisms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Drink	**Drink (male)**	**Drink (female)**	**Exercise**	**Exercis (male)**	**Exercise (female)**	**Housework**	**Housework (male)**	**Housework (female)**
Marriage	0.004	0.019	-0.012*	-0.520***	-0.593***	-0.470***	0.274***	-0.008	0.497***
	(0.009)	(0.018)	(0.007)	(0.096)	(0.140)	(0.134)	(0.059)	(0.074)	(0.089)
Gender	0.031			-0.547			0.284		
	(0.064)			(0.661)			(0.402)		
Age	-0.003	-0.004	-0.001	-0.010	-0.020	0.013	0.019	0.007	0.046
	(0.004)	(0.006)	(0.004)	(0.041)	(0.047)	(0.085)	(0.026)	(0.025)	(0.056)
Education	-0.000	-0.002	0.001	-0.015	-0.016	-0.012	-0.030**	-0.012	-0.035***
	(0.002)	(0.004)	(0.001)	(0.021)	(0.033)	(0.027)	(0.013)	(0.017)	(0.018)
Income	0.000**	0.000**	0.000	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Residential location	0.005	0.010	-0.001	0.025	-0.087	0.120	-0.008	-0.071	-0.042
	(0.008)	(0.015)	(0.006)	(0.081)	(0.119)	(0.111)	(0.049)	(0.063)	(0.074)
Cons	0.242	0.420*	0.068	4.631***	4.944**	3.325	0.436	-0.732	-0.230
	(0.163)	(0.254)	(0.167)	(1.688)	(1.958)	(3.394)	(1.025)	(1.040)	(2.241)
Individual fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y

Province fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
R^2	0.698	0.665	0.583	0.674	0.670	0.677	0.590	0.531	0.599
Observations	44,095	20,948	23,103	44,095	20,948	23,103	44,095	20,948	23,103

Standard errors are shown in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01. This table illustrates the underlying mechanisms explaining how marriage raises the likelihood of becoming overweight and obese. The analysis focuses on three specific mechanisms: drink, exercise, and household chores. The variable drink refers to individuals who consumed alcohol more than three times per week during the previous month (coded as 1 = yes, 0 = no). Exercise is quantified by the total hours spent exercising in the previous week, while household chores are measured by the number of hours dedicated to housework during the same time frame.

Table 4 presents the outcomes of the heterogeneity analysis across different age groups. As shown in Column (1) and Column (5), marriage has a statistically significant effect on increasing the probability of being overweight and obese for individuals aged 20–30, at the 1 percent significance level. However, for those in the 40–50 age group, marriage does not exhibit a meaningful influence on overweight or obesity. In contrast, among individuals aged 50–60, marriage is associated with a significant rise in the likelihood of being overweight. These findings indicate that the prominent effect of marriage on overweight and obesity is largely observed within the younger, marriageable age group under 30.

Table 4. Heterogeneous impact

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Overweight (20 ≤ age < 30)	**Overweight (30 ≤ age < 40)**	**Overweight (40 ≤ age < 50)**	**Overweight (50 ≤ age < 60)**	**Obesity (20 ≤ age < 30)**	**Obesity (30 ≤ age < 40)**	**Obesity (40 ≤ age < 50)**	**Obesity (50 ≤ age < 60)**
Marriage	0.064***	-0.001	-0.036	0.483***	0.029***	-0.082***	-0.059	0.291**
	(0.015)	(0.046)	(0.110)	(0.175)	(0.009)	(0.032)	(0.065)	(0.114)
Gender	0.087	0.148	0.016	0.348*	0.001	0.022	0.006	0.287**
	(0.129)	(0.207)	(0.256)	(0.197)	(0.074)	(0.144)	(0.150)	(0.129)
Age	0.013	-0.020	-0.009	-0.005	0.004	-0.031*	-0.002	-0.011
	(0.014)	(0.023)	(0.018)	(0.024)	(0.008)	(0.016)	(0.010)	(0.016)
Education	-0.002	-0.010*	0.006	-0.015	0.001	0.002	0.002	0.005
	(0.004)	(0.005)	(0.008)	(0.012)	(0.002)	(0.004)	(0.005)	(0.008)
Income	0.000*	0.000	0.000*	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Residential location	-0.020	0.007	0.008	0.016	-0.011	0.006	-0.013	-0.006
	(0.016)	(0.023)	(0.027)	(0.028)	(0.009)	(0.016)	(0.016)	(0.018)
Cons	-0.140	1.115	0.813	0.161	-0.070	1.193**	0.212	0.238
	(0.342)	(0.790)	(0.813)	(1.342)	(0.198)	(0.549)	(0.476)	(0.877)
Individual fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
Province fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
R^2	0.767	0.824	0.801	0.814	0.738	0.787	0.795	0.774
Observations	7435	7344	8926	9018	7435	7344	8926	9018

Standard errors are reported in parentheses, with *p < 0.1, **p < 0.05, and ***p < 0.01 indicating levels of significance. Since marriage may influence different age groups in distinct ways, this table presents the analysis of age heterogeneity. The sample was categorized into four separate age groups, and independent regressions were performed for each group to assess the effects of marriage on overweight and obesity.

Many studies investigating the causes of overweight and obesity among Chinese residents primarily emphasize factors such as dietary habits, the fast food industry, physical activity, neighborhood environments, and health awareness [24–29]. However, relatively few have examined how marriage influences overweight and

obesity in China. One earlier study reported that marriage is associated with an increased likelihood of overweight and obesity [22], but it did not explore the reasons behind this relationship. Utilizing four waves of panel data from the CFPS, our research addresses this gap and overcomes the limitations inherent in cross-sectional studies. While the marriage protection theory suggests that marriage should not significantly raise overweight and obesity rates, our empirical evidence from China indicates this theory does not hold true in this context. Our results show that marriage increases the probability of being overweight by 6.5% and obesity by 2.8%, findings that align with the perspectives of social obligation theory and marriage market theory.

Further analysis of marriage's effect on exercise time revealed a critical mechanism through which marriage contributes to overweight and obesity. Specifically, marriage is linked to a decrease in exercise duration, particularly among men. This finding is consistent with prior research from the United States [30], which suggests that marriage reduces the time available for physical activity. In China, high levels of life stress and demanding work schedules compel married individuals to allocate more time to work to ensure sufficient income for maintaining living standards. Additionally, limited social security support requires married couples to save for child-rearing expenses, intensifying the reduction in exercise time and potentially contributing to increased rates of overweight and obesity.

Conversely, our study did not find evidence that marriage leads to increased alcohol consumption that might contribute to higher overweight and obesity risk. One explanation could be that married individuals tend to eat at home more frequently, where alcohol consumption is generally lower among Chinese populations. On the other hand, marriage often entails greater work pressures and social responsibilities, especially in China where socializing frequently involves alcohol. Given these contrasting factors, the influence of marriage on overweight and obesity through changes in alcohol consumption remains inconclusive.

Our analysis of age heterogeneity revealed that the notable influence of marriage on overweight and obesity is primarily observed in the 20–30 age group. This finding aligns with the social context in China, where individuals in this age range actively participate in the marriage market and focus on managing their body shape and maintaining good physical fitness to attract potential partners. After marrying, the motivation to maintain strict weight control often diminishes, which can result in considerable weight gain. In contrast, for the 40–50 age group, our results indicate that marriage does not have a significant effect on overweight or obesity. People within this older age bracket tend to emphasize career success and financial stability when selecting partners, and weight changes related to marriage are typically less pronounced compared to younger adults.

Given the high prevalence of overweight and obesity in China, the findings of this study carry substantial importance. Overweight and obesity not only threaten residents' health and diminish their subjective well-being [2, 3], but also place a heavier financial strain on families and escalate healthcare expenditures [6]. The increased likelihood of overweight and obesity among married individuals, as demonstrated by our results, should be a priority concern for public health policymakers. Prompt actions such as promoting weight management among married people and enhancing access to convenient exercise opportunities could be crucial steps toward improving the overweight and obesity situation among Chinese residents.

This study has some limitations that need acknowledgment. Firstly, due to data constraints, we were unable to further explore whether marriage influences total food consumption or leads to greater intake of high-calorie foods—factors known to contribute significantly to post-marriage weight gain through dietary changes. Moreover, despite employing a fixed-effects model and controlling for various potential influencing factors, we recognize that it is not possible to account for all confounding variables. Secondly, the impact of marriage might differ across various city types; however, this aspect could not be analyzed due to the absence of detailed city-level data in the CFPS. Future research could address these areas.

Conclusion

This study demonstrates that marriage significantly raises the probability of overweight and obesity in China, regardless of gender. A key mechanism identified is the reduction in exercise time following marriage. These results offer valuable insights into the socioeconomic determinants of overweight and obesity. Accordingly, health management authorities should prioritize policies that encourage married individuals to engage in more physical activity and facilitate the provision of more accessible fitness facilities for families.

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