



Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

The impact of marriage and parenthood on male body mass index: Static and dynamic effects

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ARTICLE INFO

Article history:

Received 4 November 2016
 Received in revised form
 15 May 2017
 Accepted 16 May 2017
 Available online xxx

Keywords:

Male BMI
 Marriage
 Divorce
 Parenthood
 Childbirth
 Dynamic panel-data estimation

ABSTRACT

Rationale: Numerous cross-sectional studies investigated the link between marital status and BMI in the context of competing social science theories (marriage market, marriage selection, marriage protection and social obligation), frequently offering conflicting theoretical predictions and conflicting empirical findings.

Objective: This study analysed the effects of marriage, divorce, pregnancy, and parenthood on male BMI in a longitudinal setting, avoiding the estimation bias of cross-sectional studies and allowing for an analysis of BMI fluctuation over time and the dynamic effects of these events.

Method: Using the Panel Study of Income Dynamics 1999–2013 dataset ($N = 8729$), this study was the first to employ a dynamic panel-data estimation to examine the static and dynamic effects of marriage, divorce, and fatherhood on male BMI.

Results: The study showed that married men have higher BMI, but marital status changes largely drove this static effect, namely, an increase in BMI in the period following marriage, and a decrease in BMI preceding and following divorce.

Conclusions: Thus, this study found marked evidence in support of the marriage market and social obligation theories' predictions about male BMI, and supports neither marriage protection theory nor marriage selection theory. Wives' pregnancies had no significant effect on BMI; instead, men tend to have higher BMI in the periods following childbirth. Finally, analyses showed marked contemporaneous correlations between husband and wife BMI over the course of marriage.

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Excess weight is a risk factor for many chronic diseases, including cardiovascular diseases, diabetes, and certain cancers (Field et al., 2001; Mokdad et al., 2003; Visscher and Seidell, 2001). Consequently, obesity imposes a cost to the health care system (Thorpe et al., 2004; Withrow and Alter, 2011), negatively impacts individual productivity, and coincides with lower reported well-being (Jia and Lubetkin, 2005; Katsaiti, 2012). Given major public health concerns about obesity and individual interest in diet and fitness, understanding what social science factors can cause weight fluctuations is key. Several theories link body mass index (BMI) to marital status and/or parenthood. Specifically, this study examined the static and dynamic effects of these life course events in the context of marriage market, marriage selection, marriage protection, and social obligation theories. Moreover, the empirical findings on parenthood and male BMI link to the emerging adaptive perspectives on the biology of fatherhood.

As this study examined the relationship between male BMI, marital status, and parenthood, in the following two subsections, I review these themes. The first subsection introduces the theoretical and empirical links between marriage, divorce, and BMI, and the second between pregnancy, early parenthood, and BMI. While the literature has addressed static effects based on previous empirical research, there is little prior empirical research on the dynamic effects measuring the change in male BMI due to changes in marital status and pregnancy in the following periods. Though the current study of the latter was largely exploratory, for readers' convenience, this discourse formulates all examined relationships as hypotheses.

1. Male BMI and changes in marital status

1.1. Theoretical predictions and empirical findings

Marriage protection theory states that married adults will have

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better physical health because of the increased social support and reduced incidence of risky behaviour among married individuals. Social obligation theory states that those in relationships may eat more regular meals and/or richer and denser foods due to social obligations, which may arise because of marriage. Marriage market theory implies that individuals who are on the matching market have higher incentives and exert more effort to stay fit than individuals who are already or still married (Averett et al., 2008; Lundborg et al., 2007), resulting in higher BMI among married individuals than those not married. Marriage selection theory posits that individuals with lower BMI are more likely to be selected as spouses (Mukhopadhyay, 2008). Under this theory, marriage has no impact on individual BMI, but rather people with lower BMI are more likely to become married.

These theories make conflicting predictions about whether married individuals have higher or lower BMI than non-married individuals. However, when examining the link between marriage and BMI over time, three of these approaches are not mutually exclusive. Specifically, marriage selection theory expects partners to have lower BMI before and upon becoming married. Afterwards, in line with social obligation and marriage market theories, due to a change in lifestyle and without the matching market incentives, partners should gain weight. Examining BMI fluctuation in the context of the timing of marriage and divorce can shed light on the coexistence of these theories. Investigating BMI time path may also help explain mixed findings about BMI and marital status in cross-sectional studies. For instance, Noppa and Bengtsson (1980) and Sund et al. (2010) found that married individuals have lower BMI; Kittel et al. (1978), and Umberson et al. (2009) found no differences in BMI between married and non-married individuals; and yet many studies found higher BMI among married individuals (Ball et al., 2002; Hahn, 1993; Heineck, 2006; Klein, 2011; Sobal and Rauschenbach, 2003; Wilson, 2012; Sanz-de Galdeano, 2005). One of the possible reasons for these contradicting results is that these studies failed to consider individual and dynamic effects of marital status changes in a longitudinal setting by measuring the BMI impact of periods preceding and following marriage and divorce.

Based on nine representative studies across Europe, Mata et al. (2015) found that, controlling for age and socioeconomic status, never married respondents had a lower BMI than married respondents. As these authors noted, a limitation of their work lies in the fact that the data used were cross-sectional and therefore they could not draw causal inferences and evaluate changes over time. There have been significantly fewer longitudinal studies and among these Meltzer et al. (2013) and Averett et al. (2013) found that either both partners, or women in particular, gain weight across the marital transition. Dinour et al. (2012), in their literature review of association between marital transitions and changes in BMI, found that transitions into marriage were associated with weight gain, whereas transitions out of marriage were associated with weight loss.

1.2. Research hypotheses

In the context of marital status, this study tested five hypotheses. Hypothesis 1 has been supported by numerous empirical research. Hypotheses 2, 3, and 4 focus on the dynamic effects of BMI change due to changes in marital status that can likely account for much of the static effect of higher BMI among married men found in the literature.

Hypothesis 1 (static effect). *Married males have higher BMI than unmarried men.*

This hypothesis is consistent with two out of four discussed

theories, namely marriage market and social obligation theory.

Hypothesis 2 (dynamic effect). *Men's BMI is lower in the period preceding marriage.*

This hypothesis is consistent with the marriage selection theory, as fitter men are more likely to marry.

Hypothesis 3 (dynamic effect). *Men's BMI increases in the period following marriage.*

Marriage market theory implies high incentives to be fit when in the marriage market and a decrease in these incentives after becoming married, resulting in higher BMI. Social obligation theory explains an increase in BMI following marriage as a lifestyle change. This hypothesis is not consistent with marriage protection theory, as this theory predicts that married adults will have better physical health and lower BMI.

Hypothesis 4 (dynamic effect). *Men's BMI decreases in the time preceding and following divorce.*

A decrease in BMI in both of those periods supports marriage market theory as anticipation of re-entering the marriage market increases the incentive to be fit. Social obligations may also change in the period preceding dissolution of marriage, leading to a lower BMI. Marriage selection theory does not make this hypothesis, as it does not capture intentional behaviour in response to changing incentives. Finally, this hypothesis is not consistent with marriage protection theory.

Hypothesis 5 (continuous effect). *Men's BMI increases when wives' BMI increases and vice versa.*

This hypothesis has no identification power and is consistent with all presented theories, as plausibly the same behavioural incentives and motivations apply to wives as husbands. Still, if true, it is an important empirical pattern and a relevant control variable in estimating dynamic effects proposed in this article.

2. Male BMI and transition to parenthood

2.1. Theory and empirical findings

Almost all reviewed articles either excluded pregnant females or did not report how they treated pregnancy in analyses. In a longitudinal study, Meltzer et al. (2013) controlled for pregnancy when investigating the impact of marital satisfaction on BMI of 169 females and found that spouses in satisfying relationships relax their effort to maintain weight, a finding in line with the marriage market theory. Umberson et al. (2011), using growth curve analysis, showed that parenthood is associated with trajectories of long-term weight gain. Based on four survey waves every three to seven years, they also examined the impact of transitions into and out of marriage and found no effect of the former and a negative effect on BMI of the latter.

Clearly, pregnancy naturally increases female BMI, but very little research has examined the impact of pregnancy, childbirth, and the following periods of childcare on male BMI. Indeed, Gray and Anderson (2010) emphasized that studies addressing differences in men's weight associated with marital status were more available than studies on weight and fatherhood. One of the first and only studies on the topic, that of Clinton (1987), found, based on self-reported information, that expectant fathers experienced more unanticipated weight gain during their partner's third trimester compared with non-father controls. In an important study, Gettler et al. (2017) found that partnered men residing with children had elevated adiposity, measured also using BMI,

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