

Working paper

Empowering girls, delaying marriage: Exploring the role of marital age and education on domestic violence in India

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Abstract

Domestic violence represents the most important component of violence against women. Whilst some literature report female empowerment as a protective factor against domestic violence, some literature find the opposite because the husband may attempt to compensate for the enhanced status of his wife. This paper aims to investigate the effects of female empowerment in the form of marital age and education on domestic violence in India, where intimate partner violence is amongst the highest in Asia. The analysis is based on the sample of eligible women aged 15-49 with valid response on domestic violence in the 2015-2016 National Family Health Survey (NFHS-4) (n=9722). Upon estimating a series of instrumental variable (IV) regressions using age at menarche as an exogenous and strong instrument, we establish a causal relationship between empowerment and domestic violence taking into account the endogeneity of marital age and education. We further disentangle the relationships between domestic violence and age at marriage and education, separately. In addition, we investigate how marriage age and education influence domestic violence through labour market participation and spouse quality channels. We find that: i) empowered women do experience less domestic violence; ii) marital age and education are partially complementary; iii) labour market participation and spousal quality are relevant mediators of these relationships. Policies aiming at reducing domestic violence in India hence should be holistic, focussing on investing in education both for women and men and improving the conditions of the women' labour market.

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1. Introduction

It is estimated based on data from over 80 countries that as many as one in three women worldwide have experienced either physical and/or sexual intimate partner violence or non-partner sexual violence in their lifetime (García-Moreno et al 2013). This figure is alarming because violence against women is a human rights violation with domestic violence representing its most important component (Devries et al, 2013a). The Sustainable Development Goals (SDGs) endorsed by 193 member states of the United Nations (UN) in September 2015 has explicitly set a goal to achieve gender equality by 2030 (Goal 5). Not only does Goal 5 on gender equality set a target to 'end all forms of discrimination against all women and girls everywhere', it also endeavours to 'eliminate all forms of violence against all women and girls in the public and private spheres' (UN Women 2018).

Not only does domestic violence violate human rights, it is also recognised as a public health issue. Domestic violence has been found to have negative consequences on a variety of health outcomes ranging from reproductive health (e.g. increased risk for low birth weight infants, pre-term delivery, infectious complications) (Sarkar 2008), depressive symptoms (Bacchus et al. 2018; Devries et al. 2013b) to engaging in risky health behaviours such as smoking, alcohol consumption and substance abuse (Chambliss 2008). With their health and well-being being undermined, gender-based violence also hinders women's full participation in public life, education, labour force and regular activities.

Domestic violence is a complex social phenomenon and understanding its causes can help in designing strategies to reduce its incidence. While psychological approaches focus on the role of individuals' experiences such as traumas or stress, social and family system theories suggest that domestic violence should be understood by considering men's behaviour in relation with the social and family context (Hyde-Nolan and Juliao, 2012). According to *resource theories*, the more social, economic and personal resources a person can control within a social system (typically, the family), the more force he will be able to muster. In this context, violence or the threat of violence is an extreme measure employed to gain obedience and compliance (Goode, 1971). Men with less (absolute or relative) resources would thus be more at risk of being abusive because they do not have material resources typically used to assure obedience and compliance (Anderson, 1997). A refined version of the resource theory (i.e. *gendered resource theory*) proposes that gender ideology can interact with this structural process, with men holding strong breadwinner ideals being more prone to use violence with intimate partners (Atkinson et al, 2005). Similarly, *control theories* are based on the idea that domestic violence is used as a means to maintain male dominance, control and power (Bostock et al, 2002). Violent behaviours are used to prohibit the less powerful members of the family from engaging in challenging behaviours that the controlling individual does not want. Gender ideologies such as patriarchal traditions play a crucial role in this context.

Whilst the existing empirical research has generally provided evidence in support of these theories, especially in their 'gendered' versions, international organisations and women's movements have mainly focused on the concept of empowerment of women. In social sciences research, women's empowerment can be defined as the acquisition of resources in order to exercise agency or the ability to make strategic life choices where these choices have been limited (Kabeer, 1999; Yount, Crandall and Cheong, 2018). Not only is empowerment in the form of higher education, improved financial independence and better labour market outcomes an important step towards gender equality in itself, it is also a fundamental strategy for achieving other sustainable development goals.

With respect to domestic violence, it is however not clear in which direction an improved status of women affects intra-household violence. On the one hand, empowering women can be expected to increase conflict,

making violence a more likely strategy for men feeling threatened by women's higher status to emphasise male authority and relieve anxiety triggered by challenges of traditional gender roles. On the other hand, empowerment might have positive spill-over effects on men's attitude toward gender equality as well as improve women's chances to get a better husband.

The general purpose of the present paper is to investigate the effects of female empowerment on domestic violence using data on India. Our focus is on empowerment in the form of marital age and education. The main contributions of this paper are twofold. First, we disentangle the relations between two important dimensions of empowerment (i.e. education and marital age) and domestic violence. In our paper, not only will we extensively show that early marriage and low education are both determinants of higher levels of domestic violence, but we will also focus on the pathways through which these two dimensions interact with each other. Secondly, we develop a causal model and draw conclusions that are robust to different specifications. In particular, in measuring the association between our empowerment variables and domestic violence, we run into one relevant empirical issue: the same inequitable gender norms that give rise to early marriages and low education might also perpetuate violence (i.e. endogeneity). Confusing *association* with *causation* in this context would misguide our final evaluation of empowerment policies and jeopardise our attempt to investigate causal relationships. For this reason, an instrumental variable approach is used in order to disentangle the random variation in marital age and associate it with both education and domestic violence. The instrument used, namely age at menarche, has been used before in other contexts and is widely accepted as a powerful source of exogenous variation (Field and Ambrus, 2008).

The paper proceeds as follows. Section 2 provides a detailed discussion of the theoretical, empirical and institutional background underlying our research questions and analysis. Section 3 and 4 describe the data and the empirical strategy, respectively. Section 5 reports the results, which are then discussed in Section 6.

2. Background

2.1 Theoretical background

It is possible to distinguish between two broad sets of theories according to whether empowerment can have a *'shielding'* or an *'exposure'* effect on domestic violence (Bettio and Ticci, 2017).

The former approach predicts that higher empowerment reduces the risk of experiencing domestic violence. For example, according to the theory of marital bargaining, an empowered woman would increase her utility level after divorce, making her threat to leave the relationship more credible (Chin, 2016). This way, she could enjoy a more favourable treatment within the marriage. When empowerment comes in the form of increased access to the labour market, this additionally reduces the time a woman would spend at home being exposed to the abusive partner (*exposure theory*; Dugan, Nagin and Rosenfeld, 2003).

On the contrary, other approaches predict that empowerment can expose women to a *male backlash*, increasing their risk of experiencing domestic violence (Chin, 2016). According to the relative resource theory, for example, empowerment might clash with prevailing social norms of male dominance (Hornung et al, 1981; Macmillan and Gartner, 1999). The husband would thus use domestic violence as a way to compensate for the lost authority. Note also that in this case male partners with lower resources relative to the woman are more likely to become domestic violence perpetrators. A similar prediction comes from *evolutionary theory*, which suggests that paternal uncertainty could represent the source of spousal violence. In this case, domestic violence would be the result of the jealousy that males feel when their partners have potential

chances to be in a sexual relationship with other males (Eswaran and Malhotra, 2011). Another reason for male backlash is suggested by *rent extraction theory* (Bloch and Rao, 2002). Based on this approach, since an empowered woman is more likely to have more material resources, her partner would feel incentivised to use violence in order to extract them directly from the woman.

The empirical literature finds evidence for both shielding and exposure effects. The effects are particularly ambiguous with respect to economic empowerment, i.e. employment and financial independence of women (Vyas and Watts, 2009). Exposure effects associated to working women have been found in multiple developing countries using the Demographic and Health Survey (DHS) data (Kishor and Johnson, 2006). In countries like India, Peru, Colombia, and Nicaragua, a woman that engages in employment, paid or unpaid, is more likely to be a victim of domestic violence. Similar results are reached by Chin (2011) and Bloch and Rao (2002) for India and by Guarnieri and Reiner (2018) for Cameroon. Macmillan and Gartner (1999) originally found male backlash evidence also for a rich country such as Canada. On the contrary, Kishor and Johnson (2004) found that empowerment in the form of employment seems to have a shielding effect in Egypt. Panda and Agarwal (2005) found that in Kerala (India) women with regular employment are less likely to experience domestic violence. Similarly, in a recent report from the European Commission, Bettio and Ticci (2017) find that financial independence has a shielding effect on domestic violence for European women. However, none of these studies satisfactorily address the endogeneity issue, for example, of traditional gender norms which encourage both domestic violence and sustention of low female status.

Although employment and financial independence are important dimensions of empowerment, they are not the only one. As a matter of fact, they are the result of a process that can start much early on in life. Effectively tackling domestic violence would in this sense require that we acquire knowledge of the empowerment processes in order to intervene as early as possible in the life cycle of the women exposed to the risk of domestic violence.

Early marriage (below the age of 18), in particular, can affect women's agency by disrupting their accumulation of human capital and consequently acquisition of enabling resources (Yount, Crandall and Cheong, 2018). Foregone resources include loss of knowledge and skills (Field and Ambrus, 2008) and lost earnings due to late entry to or early exit from the labour market (Dahl, 2010). More importantly, under-age marriage constrains overall well-being by denying girls their childhood (UNICEF, 2005), and reducing the opportunities for personal, emotional, and psychosocial development during the critical middle phase of adolescence. Critical knowledge about reproductive and sexual health is also gained during the adolescent years, either through school or peer groups (Mathur, Greene, Malhotra, 2003). The absence of this knowledge coupled with the lack of opportunity for psychosocial development for developing the sense of agency are likely to be associated with adverse health outcomes and lack of control over fertility and family planning (Marpathia, Ambale and Ried, 2017). According to this prevailing theoretical approach, the household bargaining model thus predicts that increased economic opportunities for women (e.g., better employment prospects, higher wages) reduce domestic violence by reducing the gap of power between partners (Aizer, 2010).

Contrary to this well-recognised argument, the shielding effect of increased age at first marriage does not always hold true. In a patriarchal culture where divorce is not a viable option, better social and economic status of females does not necessarily translate into higher bargaining power since it can be viewed as a challenge to the socially prescribed dominance of men, triggering a male backlash. When power relations are redefined, it could thus be that men resort to violence to reinstate a culturally prescribed norm of female dependence (Aizer, 2010; Luke and Munshi, 2011; Macmillan and Gartner, 1999). Whether male backlash

could counterbalance the expected domestic violence-reducing effect of empowerment is ultimately an important empirical question.

Apart from age at marriage, education is also a fundamental source of female empowerment. Education is key to the psychological, economic and social status of a person. Indeed, by defining knowledge, skills and the psychosocial development of girls, education is at the very heart of the definition of empowerment. There are multiple channels through which education can help reduce the woman's likelihood of becoming a victim of domestic violence: by increasing awareness over the unacceptability of domestic violence; by increasing the bargaining power of the woman within the household (Chin, 2012); and by reducing the time a woman is at home exposed to the male perpetrator through increasing her employability (Dugan et al, 2003). Similar to the effect of early marriage on domestic violence, even though more educated women are by definition empowered, higher education does not necessarily reduce the likelihood of experiencing domestic violence. The relationship between marital age and education also deserves an attention. In South Asian societies where there is usually a 'choice' between human capital investment and other life opportunities, getting married generally means leaving school (Marpathia, Ambale and Ried, 2017). As a result, child marriage reduces the likelihood for girls to complete their secondary education. When being asked why their daughters dropped out of school, marriage is often one of the main reasons, if not the only reason, given by the parents in household surveys (Wodon, 2017). A similar conclusion is reached when modelling the relationship between child marriage and educational attainment econometrically (Field and Ambrus, 2008). A one year reduction in the age at first marriage (before a girl turns 18) is associated with a reduction in the likelihood of completing secondary school of typically four to ten percentage points, depending on the country or region. It is thus evident that early marriage is one key determinant of the level of education of a woman. As a consequence, husbands and mothers-in-law can easily exert greater control over younger women, who, being less educated, are less able to assert themselves (Jensen and Thornton, 2003; Kumar et al., 2016). Das Gupta terms this subordinated position as '*double powerlessness*' (Das Gupta, 1995).

Understanding the relationship between age at marriage and education is also relevant for setting focused and efficient policies addressing domestic violence. It is possible that education is the only mechanism through which marital age affects domestic violence. If this were the case, age at marriage would *de facto* represent redundant information. Accordingly, in order to tackle domestic violence, authorities could simply focus on education only. If, on the other hand, age at marriage plays a role in domestic violence beyond the role of educational attainment, then optimal policy interventions would require addressing both early marriage and education in a coordinated and holistic effort for empowerment.

2.2 Institutional background: India context

India has persistently high prevalence of intimate partner violence in Asia. About 1 in 3 Indian women (36% measured in 2005-2006) experienced physical violence by intimate partner in their lifetime (United Nations, 2015). Depending on study methodology, estimates of the prevalence of domestic violence in India range from 18 to 70% (Babu and Kar, 2010). Widespread domestic violence in India is deep-rooted in social and cultural norms of male patriarchal roles where women are considered to be subordinates throughout their life course. These norms are reflected in son preference and husbands' unlimited control and power over their wives (Fernandez, 1997). Indeed, almost half (46.7%) of married women in India report that intimate partner physical violence by husband is justified due to the prevailing patriarchal norms (Solotaroff and Pande, 2014). Furthermore, the patrilineal family system where a married woman is considered to be a property of her

husband and her family also contributes to the uniqueness of domestic violence in India. It is not uncommon for the husband's family to exercise psychological and physical abuse over the married woman (Raj et al., 2011). This includes dowry-related harassment, neglect, isolation and control over reproductive choices and family planning (Rastogi and Therly, 2006; Stephenson et al., 2008).

In 2011, an estimated 720 million women aged 18 years or older in the world were married under-age compared with 156 million boys (UNICEF, 2014). India is an outlier also in terms of early marriage. It is one of the countries with the highest percentage of women aged 20-24 who were married before the age of 18 years (more than 60%). Legally, both the Child Marriage Restraint Act of 1929 and the Prohibition of Child Marriage act of 2006 set the marriage age for girls at 18 years (with some exceptions allowed for Sharia and Mohammedan Law). However, these laws have been so traditionally difficult to enforce that it is fairly evident that they are not binding. Family and social traditions play a much more important role. This is also why child marriage rates vary across Indian states, with Jharkhand and West Bengal being the states with the highest prevalence of the phenomenon (Srinivasan et al, 2015).

In 2009, the Indian Parliament passed the Right to Education Act, introducing free and compulsory schooling for children between the ages of 6 to 14 years. Despite this step forward, according to the 2011 census data, disparities in female literacy across Indian states remain persistent, with Kerala showing a female literacy rate of 92%, while Bihar only 51% (Census India). Overall, India's female literacy rate in 2011 was 59.27%, significantly lower than the world average of 80.7% (Census India).

3. Data and methods

3.1 Data and descriptive statistics

We use data from the latest available (2015-2016) National Family Health Survey (NFHS-4) conducted with technical assistance from the Demographic and Health Survey (DHS) programme. The NFHS-4, which is part of the DHS programme, is a nationally representative cross-sectional household survey conducted in India in the areas of population, maternal and child health, reproductive health, nutrition and family welfare (International Institute for Population Sciences (IIPS) and ICF 2017). The household questionnaire is used to identify eligible women (i.e. women aged 15 to 49 who are members of the household) to participate in the women's questionnaire that includes topics on basic background characteristics, reproductive behaviour and intentions, family planning, children's health, sexual life and household relations. Most importantly, and for the purpose of this analysis, it also includes a section on women's empowerment and domestic violence. The large sample size allows for disaggregated analysis by geographic and demographic characteristics. The rich information about the woman and her family, gender relations and domestic violence makes the NFHS-4 an ideal dataset to answer our research question.

The unit of analysis is the individual woman. The sample consists of all women between the ages of 15 to 49 years that agreed to take part in the survey (97% response rate). While the survey is conducted with 699,686 women, not all respondents participated in the domestic violence module due to reasons of privacy and ethical guidelines set by the WHO. Due to ethical requirements only one woman per household was randomly selected for this module. Of the 699,686 women, only 11% were selected and interviewed for the domestic violence module. After excluding observations with missing values on age at menarche and other key variables, our sample includes 9,722 women across different districts and states in India.

Table 1. Descriptives of the main variables included in the analysis (NFHS 2015-2016).

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Demographics					
Marital age	9,722	17.889	2.451	0	24
Menarche age	9,722	13.553	1.197		18
Age	9,722	21.648	1.988	15	25
Education (years of schooling)	9,722	7.368	4.625	0	20
Violence					
Less severe violence	9,722	0.247	0.431	0	1
Severe violence	9,722	0.058	0.235	0	1
Sexual violence	9,722	0.065	0.246	0	1
Other relevant variables					
Worked in the past 12 months	9,722	0.190	0.393	0	1
Husband education (no. of years)	9,695	8.208	4.485	0	20
Control variables					
<i>Religion</i>					
Hindu	9,722	0.801	0.4	0	1
Muslim	9,722	0.113	0.316	0	1
Christian	9,722	0.050	0.217	0	1
Sikh	9,722	0.015	0.122	0	1
Others	9,722	0.022	0.146	0	1
<i>Caste</i>					
Scheduled caste	9,722	0.213	0.409	0	1
Scheduled tribe	9,722	0.187	0.390	0	1
Other backward caste	9,722	0.429	0.495	0	1
None of them	9,722	0.171	0.377	0	1
<i>Childhood nutrition</i>					
Height (cms.)	9,722	151.71	5.94	97.7	194.6
<i>Place of residence</i>					
Urban	9,722	0.229	0.420	0	1
<i>Household wealth index</i>					
Poorest	9,722	0.225	0.418	0	1
Poorer	9,722	0.249	0.432	0	1
Middle	9,722	0.226	0.418	0	1
Richer	9,722	0.177	0.382	0	1
Richest	9,722	0.122	0.328	0	1

Key variables used in the analysis are described here and summary statistics of the dependent and other relevant variables are reported in Table 1. The average woman in the sample is 21.6 years old (SD 1.9). Age at marriage ranges from 0 to 24 years (SD 2.4); almost 43% women report getting married before the legal marital age of 18 years.¹ Average age at marriage is 17.8 years, which is just slightly below the legal age of marriage. In certain parts of India, especially in the north, early marriage is simply a ritual and consummation of marriage takes place once the girl achieves puberty or is deemed mature enough. It is also at this point that the girl after performing a ceremony known as *gauna* starts cohabitation with her husband (Joshi et al. 2001). Due to this unique practice and the relevance of it to domestic violence, we define marital age as the age of first cohabitation i.e. when the woman moves in to live with her husband.

We exploit the random variation in marital age arising due to age at menarche. Therefore, accurate data on menarche age is essential for this strategy to work. While recall accuracy of self-reported age at menarche is questionable, given that this is such a salient event in the life-course of a woman, it is unlikely that a measurement error exists. Indeed, prior research suggests that women are able to accurately recall the timing of menarche as it induces significant lifestyle changes (Field and Ambrus, 2008).

Besides marital age, education is also considered as an important form of empowerment. Education is measured as the total number of years of schooling. Average number of years of schooling is 7.3 (SD 4.6). Approximately 19% of women in our sample never entered school while about 9% completed higher education. As expected, marital age is the lowest among women that never went to school (mean: 16) and increases systematically with years of schooling - the highest for those that have achieved higher than secondary education (mean: 20). We also further categorise education into 'no and primary education' if the woman reports between 0 and 5 years of schooling; and 'secondary and higher education' if she reports between 6 and 20 years of schooling. This classification allows us to capture the role of marital age separately from that of education disruption due to early marriage. Specifically, women in the category no and primary education dropped out of school even before achieving menarche. Hence, the variation in marital age captured due to age at menarche does not affect education for these women. In the latter category of women with secondary and higher education, however, we can expect the effect of marital age to operate through education if early marriage does interrupt educational attainment.

The DHS module on domestic violence is conducted in accordance with the WHO ethical guidelines and implemented only in complete and absolute privacy thus alleviating concerns related to reporting biases. Further, special weights are applied to ensure a nationally representative subsample is included in the module. The module is divided into different sections. This study specifically focuses on physical and sexual violence. Physical violence is categorised into less severe and severe physical violence and measured as a binary indicator that equals one if the woman reports facing any type of violence. Thanks to the detailed nature of the interview questions, we can further explore the exact violence tactic used by the husband. Less severe violence is further categorised into slapping, pushing, punching and twisting the arm. Severe forms of violence include kicking, strangling, and threatening. A binary indicator is generated to measure each of these violence tactics. Similarly, sexual violence is a binary variable that equals 1 if the woman reports being physically forced for sexual intercourse even when not desired, forced for unwanted sexual acts, and forced for sex with threats; it is 0 otherwise.

¹ Only one woman in the sample reports cohabitation before 1 year of age. Results are robust to the exclusion of this observation.

While the use of self-reported data on domestic violence can face a problem of underreporting, the use of administrative data obtained from hospitals or police stations in developing countries have also been criticised, as this gives rise to a further selection bias based on accessibility to authorities and willingness to report (Erten and Keskin, 2018). Since the NFHS is conducted in absolute privacy and the woman is ensured that no other household members will ever know what questions were asked, it is unlikely that underreporting is a major problem for our analysis. Overall, 24% of women report being victims of less severe violence. Slapping is the most common form within this category (22.5%) while punching is the least common (6%). Severe violence is reported by only 6% of women among which kicking is the most common form of severe violence (6%). A similar percentage report sexual violence (6%), of which 5% report having been physically forced to have sex. The effect of marital age on experiencing domestic violence holds for both, the 'no education' category and the 'secondary and higher education' category indicating that marital age may have a direct role in domestic violence beyond that operating through education.

As outlined in the theoretical background section, this paper seeks to explain two main mechanisms underlying domestic violence, i.e. women's labour market participation and spousal quality. Labour market participation is measured using one binary variable which equals one if the respondent has worked in the past 12 months. The second possible mechanism relates to women selecting better (or selecting out poor) quality husbands. We use spousal education measured as the number of years of schooling as a proxy for spousal quality. The selection mechanism for the woman's part may also be at work when the woman makes her own marital choice. However, arranged marriage in India is a common practice where most women do not even meet their husband before marriage let alone have a say in choosing them. As a result, any impact we observe on spousal quality of marital age is likely to be due to the husband's selection of the wife, thereby improperly attributing empowerment to the woman due to late marriage.²

To shed light on this issue, we turn to another dataset, the Indian Human Development Survey (IHDS) 2011-2012, where questions on marital choice are included in the survey³. The IHDS is a nationally representative survey of 42,152 households covering a wide range of topics including health, education, employment, marriage, fertility and gender relations. The same estimation strategy is used to investigate whether marital age empowers women to exercise their choice of husband. We use two choice variables: the first one asks the respondent who chose the husband and equals one if she did this alone; it is coded 0 if anyone else chose or she jointly chose with someone else; the second asks if the respondent had any say in the choice of the husband which equals one if she did. We also use the same education classification in this dataset to separately assess the role of marital age through education and also the independent role of marital age on domestic violence.

² Here late marriage would still empower women indirectly through the preference of an educated husband in choosing an educated wife. However, our objective is to assess whether the woman can make her own marital choice despite being low educated.

³ Unfortunately, unlike the NFHS, questions on personal experience with domestic violence are not included in the IHDS. Only personal observation of community level domestic violence questions are. Nevertheless, the IHDS has relevant information on marital age, age at menarche, education and female empowerment. We first assess whether we find the same relationships between marital age, age at menarche and education in the IHDS as we did in the DHS.

3.2 Methods

In order to disentangle the complex relation between marital age, education and domestic violence, we test a series of hypothesis, modelling the process that causes domestic violence in two steps. In the first step, we perform analyses investigating the causal relations between domestic violence and both marital age and education separately. In this case, the basic hypothesis holds that both marital age and education are causally determining domestic violence. In other words, the earlier the marriage and the lower the level of education, the higher the likelihood to be a victim of domestic violence. Starting from what is pointed out in Marpathia, Ambale and Ried (2017), and consistently with the idea that early marriage 'predates' school dropping for secondary and tertiary levels of education, we then test whether and to what extent education represents a mediator in the relationship between marital age and domestic violence. The main assumption here is that marital age can have a specific role in determining domestic violence besides the early school dropping effect it might induce.

Investigating causal relations in this context requires tackling the endogeneity issue. The same inequitable gender norms that give rise to early marriages and low education might also perpetuate violence. Without addressing this specific empirical problem, it would be impossible to understand how to interpret a correlation between empowerment and domestic violence. This represents a really important concern for both scientific and policy reasons. In the present analysis, we rely on an instrumental variable approach, which is well-established and widely used in all areas of social and health sciences (Imbens 2014). The main idea is to focus only on the source of variation that is independent from the endogeneity process we are concerned about. By changing the causal variables which are exogenous, any consequent variation in the outcome can only be due to the causal relation we want to test (and not due to common causes or reverse causality). For this reason, we follow Field and Ambrus (2008) and use age at menarche as an instrument for marital age. In a setting like India and other South Asian countries, age at menarche signals 'readiness for marriage' (Raj et al. 2015). Parents typically marry out their daughter at the onset of puberty possibly because preservation of virginity of prospective brides is highly valued in this context. The girls are likely to be considered unmarriageable if they lose their virginity and become burdens on the household (Marpathia et al. 2017). Although age at menarche might be related to unobserved health factors, generally it is well-recognised in the literature as a valid instrument since age at menarche represents quasi-random differences in the earliest age at which a girl is at risk of marrying. Using variation in age at menarche allows us to obtain exogenous variation in women's age at marriage and consequently establish a causal relationship between age at marriage, education and domestic violence.

The empirical approach thus requires an estimation of a standard two-stage IV model, formally defined by two equations:

$$DV_i = \alpha_0 + \alpha_1 X_i + \alpha_3 C_i + \epsilon_i$$

And

$$X_i = \beta_0 + \beta_1 A_i + \beta_3 C_i + u_i$$

where, for each woman i included in the sample, X is marital age or education, A is the age at menarche, DV is the indicator of domestic violence, C is a series of controls and the last terms are the equation specific errors. Controls include: age of respondent, age squared, height, religion, caste, wealth (in 5 categories) and an urban/rural dummy.

In the present analysis, we further investigate the mechanisms through which marital age and education can affect domestic violence: labour market participation and spousal quality. The main approach taken here is to split the sample in two subgroups: one group of women for which early marriage might have changed educational achievements; and one for which it does not, i.e. girls that never went to school or dropped out around the age of eight (most likely before achieving menarche).

For each subgroup, we test two main mechanisms. First, later marriage and higher education might influence the value of the women in the labour market. According to all the theories described above, labour market participation can have both positive and negative effect on domestic violence. Nevertheless, it certainly represents an important potential mechanism of transmission from empowerment to domestic violence. Second, if both marital age and education have a role in determining domestic violence, this might be because they help women selecting (or selecting out) men that are more prone to violence i.e. focusing on spousal quality.

All the hypotheses regarding the general relationships and the mechanisms are tested by using linear IV models. A series of control variables will also be included in the estimation.

4. Results

4.1 Empowerment and domestic violence

Data in Table 1 show that average marital age is slightly above 17, with a minimum of 0 (arrange marriage) and a maximum of 24. This provides evidence that the existing regulation about child marriage (e.g. The Prohibition of Child Marriage Act of 2006) is not binding but it also shows that there is enough variability for proceeding with the analysis. Average age at menarche in our sample is 13.5 years (which is in line with other countries in the world, see for example: Karapanou and Papadimitriou, 2010), with some women achieving it as early as 8 and as late as 18 years of age.⁴ Figure 1 shows how average marital age increases systematically with increasing age at menarche. Women interviewed are young and show wide variation in educational attainment. More than 20% of women have experienced some forms domestic violence, with less severe violence being the most common. Around 6% of women declared to have experienced severe or sexual violence in the household. Only 12% of women are working at the time of the interview and less than 20% have ever worked in the last 12 months.

Results of the main model for marital age and domestic violence are reported in Table 2. Since our analysis relies on age at menarche as an instrument, it is crucial to test whether it is significantly correlated with marital age (i.e. first stage regression). The first column of the table shows that this is the case. The results found in most of the literature are thus confirmed in our data (Field and Ambrus 2008; Ibitoye et al. 2017; Raj et al. 2015). Using age at menarche as an instrument we then proceed to investigate the main equation. Marital age is found to have a negative effect on domestic violence. The relation, however, is not homogeneous across different types of violence. In particular, non-sexual forms of violence seem to be more directly influenced by marital age, since the coefficient associated with the effect of marital age on sexual violence, although still negative, is not statistically significant.

⁴ We excluded women reporting extreme menarche ages (below 8 and above 20) as these may be due to nutritional, other pathological or non-random reasons.

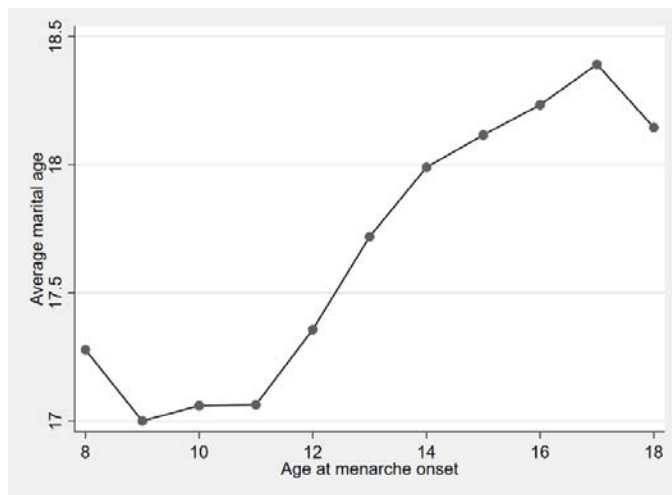


Fig 1. Relationship between age at menarche and age at marriage

Table 2. Marital age and domestic violence: main results for the IV model.

VARIABLES	Stage 1	Less severe violence	Severe violence	Sexual violence
	Marital age			
Age menarche	0.122*** (0.021)			
Marital age		-0.077** (0.032)	-0.047** (0.019)	-0.001 (0.019)
First stage F-stat		33.77	33.77	33.77
p-value		0.000	0.000	0.000
Constant	5.770 (4.102)	1.146 (0.893)	0.166 (0.501)	-0.059 (0.522)
Observations	9,722	9,722	9,722	9,722

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Controls: age of respondent, age squared, height, religion, caste, wealth (in 5 categories) and a urban/rural dummy

Education is another empowerment dimension addressed in this analysis. In understanding the relation between education and domestic violence, it is important to investigate the extent to which education mediates the effect of marital age. On the one hand, education might represent the only mechanism through which marital age can influence domestic violence given that early marriage implies leaving school early and consequently lower educational attainment. On the other hand, education and early marriage might define two separate and independent dimensions of empowerment.

As for marital age, Figure 2 shows the relevance of the instrument (age at menarche) for education, while Table 3 presents the effects of education (instrumented) on domestic violence. Education is negatively and

significantly related to any form of domestic violence. These are far from foregone results. It is well known that violence is more likely to be recognised amongst individuals with higher level of education. The survey data thus tend to underestimate possible negative effects of education on domestic violence (and this bias might be stronger for less severe violence). Hence, our results provide a *lower bound* of the impact of education on domestic violence.

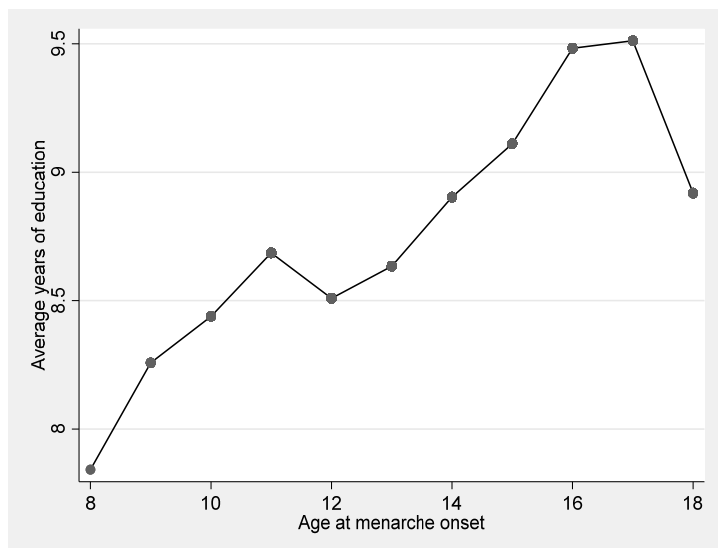


Fig 2. Relationship between age at menarche and education

Table 3. Education and domestic violence: main results for the IV model.

VARIABLES	Stage 1	Less severe violence	Severe violence	Sexual violence
	Education (Years)			
Age menarche	0.125*** (0.035)			
Education (years)		-0.075** (0.034)	-0.046** (0.021)	-0.001 (0.018)
First stage F-stat		13.03	13.03	13.03
p-value		0.000	0.000	0.000
Constant	18.67** (7.760)	2.107* (1.205)	0.758 (0.705)	-0.047 (0.625)
Observations	9,722	9,722	9,722	9,722

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Controls: age of respondent, age squared, height, religion, caste, wealth (in 5 categories) and a urban/rural dummy

Table 4: Marital age, education and domestic violence

		Education levels					
		<i>Secondary and higher</i>	<i>Secondary and higher</i>	<i>Secondary and higher</i>	<i>No and primary</i>	<i>No and primary</i>	<i>No and primary</i>
	Education Years	Less severe violence	Severe violence	Sex violence	Less severe violence	Severe violence	Sex violence
Marital age	1.143** (0.530)	-0.139* (0.084)	-0.046 (0.040)	0.022 (0.041)	-0.037 (0.031)	-0.045** (0.021)	-0.013 (0.02)
Constant	0.436 (7.376)	1.847 (1.239)	0.264 (0.599)	0.322 (0.662)	0.606 (1.664)	0.181 (1.062)	-1.158 (1.026)
Observations	6,558	6,558	6,558	6,558	3,164	3,164	3,164

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Controls: age of respondent, age squared, height, religion, caste, wealth (in 5 categories) and a urban/rural dummy

Table 4 investigates the relationship between marital age and education with respect to their impact on domestic violence. The first column shows that marital age is positively associated with the number of years of education of a woman. Instead, columns 2 to 5 show whether marital age has an effect on domestic violence once conditioned on education levels (high education, i.e. 6 to 20 years of schooling, vs low education, i.e. 0 to 5 years of education). Both severe and less severe domestic violence are negatively related to marital age for both educational groups, although the coefficients are not always statistically significant at the 0.05 level.

The results presented in Table 4 enable us to reject the hypothesis that marital age could affect domestic violence only through higher levels of education. First, higher age at marriage reduces domestic violence, even for the same education levels. Second, earlier age at marriage increases domestic violence (especially the severe one) even among the low educated women. This group includes girls that drop out before menarche and marriage, i.e. girls for which education drop-out pre-empts marriage. Hence, within this cluster, marital age certainly cannot work through education; and yet, it does have an impact on domestic violence.

4.2 Possible mechanisms

In this section, we further investigate how empowerment operates in reducing domestic violence. Empowerment might affect domestic violence in various ways. Here we investigate some well-known and reasonable channels: labour market participation and spousal quality. In the following, we will present and discuss a selection of the most relevant results.

Labour market participation is measured using one main question: 'Have you ever worked in the last 12 months?'. Early marriage might interrupt human capital accumulation both in terms of formal schooling and labour market skills. Likewise, childbearing often follows marriage and this consequently affects a women's

labour force participation. It is therefore expected that delayed marriage results in delayed fertility and subsequently improves female labour force participation. In our data, marital age is not related to either of them (results not shown here but available upon request). In other words, marital age does not affect labour market participation, which thus cannot be a channel for the reduction of domestic violence.

In Table 5, we investigate the effect of education on labour market outcome based on the assumption that labour force participation (enhanced through education) can improve a woman’s bargaining power in a household. On the contrary, we find that the more educated a woman, the less likely she is active in the labour market. This is shown in the first column of Table 5, which confirms what has already been found in other studies and more recently coined as the ‘Indian paradox’ (Chattarjee et al, 2018).

If more educated women stay out of the labour market and they are less likely to experience less severe and severe violence, we would expect that having a job increases the probability to become a domestic violence victim. These expectations are confirmed looking at the last columns of Table 5. This is consistent with the labour market participation exerting an exposure, rather than a shielding effect on domestic violence, as already found in other countries (e.g. Kishor and Johnson, 2004).

Another crucial channel through which both education and marital age could work their way to reduce domestic violence is the quality of the spouse. The relationship between the variables here is more complex than for the labour market mechanism. The analysis shows that: i) higher marital age and higher education of a woman are both associated with having a husband with more years of education (Table 6), ii) higher husbands’ education is generally associated with lower domestic violence (Table 6), iii) education differentials between a husband and a wife matter very weakly and only for less severe violence and low educated women (Table A1, Appendix). Our results point to the fact that having a highly educated husband, a proxy for the spousal quality itself, drives better outcomes for the women.

Table 5 Labour market participation and education

VARIABLES	Ever worked	Less severe violence	Severe violence	Sex violence
Education	-0.007*** (0.001)			
Ever worked		0.112*** (0.012)	0.043*** (0.007)	0.054*** (0.008)
Constant	0.856 (0.813)	0.929 (0.823)	-0.066 (0.438)	-0.005 (0.494)
Observations	9,722	9,722	9,722	9,722

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Controls: age of respondent, age squared, height, religion, caste, wealth (in 5 categories) and a urban/rural dummy

Table 6: Empowerment, husbands' education and domestic violence

VARIABLES	Education husband	Education husband	Less severe violence	Severe violence	Sex violence
Marital age	0.536* (0.290)				
Education respondent		0.527** (0.255)			
Education husband			-0.009*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)
Constant	-6.49 (8.297)	-13.33 (8.955)	0.681 (0.852)	-0.158 (0.452)	-0.082 (0.506)
Observations	9,695	9,695	9,695	9,695	9,695

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Controls: age of respondent, age squared, height, religion, caste, wealth (in 5 categories) and a urban/rural dummy

4.3 Additional evidence

The relationship between marital age and domestic violence is rather robust across different model specifications. In order to run falsification tests in Table A2 (Appendix) we provide evidence for a series of placebo regressions. The idea is that if marital age affects violence perpetrated by the husband, the same variable should not explain violence altogether. Indeed, when the analysis is extended to use violence from others (father, mother, and teacher) as a dependent variable, marital age ceases to be a significant determinant of the outcomes.

One of the main results of the analysis is that spousal quality is a channel for explaining domestic violence. But how does this mechanism work? Empowered (highly educated) women are certainly more likely to come from families with more privileged background and can thus have access to highly educated potential husbands in the marriage market. However, it is also possible to explain the relationships between marital age, education and spousal quality by hypothesising that empowered women are more likely to play a strong role in the choice of their husband. After all, agency and 'the ability to make strategic life choices' are the very definition of empowerment (see Section 1). With the NFHS data we would not be able to test the hypotheses along this line since there is no information on women's marital choice.

We thus turn to a different dataset in order to shed some light on this specific relationship. In the Appendix (Table A3), we report a series of results based on the 2011-2012 wave of the Indian Human Development Survey (IHDS), which provides more information on the role of the woman in the marriage choice. In particular, the survey includes whether the woman played an active role in choosing her husband. Using this as a dependent variable, the results show that higher marital age and higher education (instrumented for the age at menarche) are positively related to the probability of the woman choosing the husband. This finding

further supports our hypothesis that higher marital age and higher education empower the woman to have a say in her spousal choice and consequently reduces her chance of facing domestic violence.

5. Discussion and conclusion

Achieving a better understanding of the social and demographic determinants of domestic violence is important if a country wishes to progress towards achieving SDG5 aiming to end all forms of gender inequality. Domestic violence is not only, and probably not much, a policing problem; it is a social issue that must be tackled as such. Domestic violence is recognised as a public health issue affecting both physical and psychological well-being of women (Krantz 2002) and extending into other domains such as labour market outcomes (Lloyd 1997). The present analysis investigates the causal links between women's lack of empowerment in the form of early marriage and low education. These are probably the first basic violations of women's right to express their choice and can have a strong impact of the over the life course in terms of employment, marital choice and financial independency. In our analysis, we started by considering the endogeneity issue as an important one since if the causal link can be established, it provides empirical support in designing relevant policy interventions. Hence, we used age at menarche as an instrument for empowerment. In our analysis, age at menarche never fails to be significantly and positively related to both marital age and education suggesting that the two variables causally influence domestic violence. The relationship between instrumented empowerment measures and domestic violence is complex, but the analysis allows us to empirically explain the mechanisms proposed in the theoretical and empirical literature. The first and most general finding is that empowerment, in both forms, has a *shielding effect* for domestic violence. This effect is stronger for physical rather than sexual violence, although education, independent of marital age, also does reduce the probability of experiencing sexual violence. It is also important to note that for education, this negative relationship is likely to represent a lower bound, since highly educated women generally tend to recognise and report experience of violence more frequently. Hence, on average and across the general Indian population, *empowered women do experience less domestic violence*. This main result shows already an important policy implication: women empowerment is an important way forward for the reduction in domestic violence.

If education and marital age are relevant in reducing domestic violence, it is also important to understand why and how these relationships might emerge. In this sense, we can interpret our results based on two main issues. First of all, do education and marital age express the same form of empowerment or do they, at least partially, complement each other? The evidence clearly shows that marital age and education, although related (by a causal link), are not necessarily telling the same story about domestic violence. When education is controlled for by splitting the analysis by education groups, the impact of marital age persists, and it actually becomes even stronger for less severe violence and highly educated women. Furthermore, the same relation is valid also among women with very low level of education (and thus unlikely to be married when they dropped out of school). Marital age thus provides a shielding effect that is not entirely mediated by education.

Why should we bother investigating the relationship between two variables that are clearly linked and that are associated anyway with a protective effect for women? As specified in the introduction, if education is just a mediator for marital age, policies trying to increase age at marriage (by implementing the existing laws) would be redundant (at least for domestic violence). Providing higher education to all women, a goal clearly stated in all the world-based policy objectives, would in that case be enough in order to reduce domestic violence. Our evidence shows instead that higher education and implementations of marriage laws should be

pursued in parallel, since they represent two partially different forms of empowerment, at least for what concerns domestic violence.

The second set of results refers to the mechanisms through which education and marital age can affect domestic violence. We investigated two of them: i) labour market participation; and ii) spousal quality. Both are expressions of what could be considered as a 'second stage' form of empowerment, in the sense that they are preceded by education and marital age.

While marital age does not seem to be related to employment among Indian women, education (measured as the numbers of years of schooling) is negatively related to the likelihood of having worked. This is a well-known characteristic of the Indian job market for women (*Indian paradox*, Chattarjee et al, 2018). Different explanations have been proposed for this. From the point of view of a utility maximising agent, the apparent paradox might be the consequence of the fact that in a patriarchal society the income effect of the relationship between education and employment might dominate over the substitution effect (Chattarjee et al, 2018). The structure of the labour market can however be equally important: outside options for women might be not appealing in terms of quality of jobs or wage, so that women living in richer households (i.e. more educated women) would prefer not to take underpaid/underqualified jobs.

If education reduces the likelihood of working, labour market participation increases the probability of experiencing domestic violence. This is consistent with the overall negative effect of education on domestic violence and supports the theories predicting an exposure effect of employment on domestic violence. In this sense, however, it is puzzling that we do not find that having a higher education than the husband influences much the probability to experience severe and sex violence. The evidence is also consistent with the empirical results coming from a number of other low and middle income countries in Asia and South America (Kishor and Johnson, 2004). Whatever the reason, it is likely that education helps women in choosing families where they are not required to work out of necessity, thus reducing the related male backlash typical of a patriarchal society.

Spousal quality, i.e. husband's education, is positively and significantly related to both education and marital age. This defines what potentially is the strongest mechanism through which empowerment can exert its long-run effect on domestic violence. Two additional sets of results support this idea. First of all, education of the husband is negatively related to domestic violence. Together with the impact of women's education and marital age on the quality of the spouse, this evidence supports the hypothesis that empowerment increase agency and the possibility for women to choose, and hence to choose better, in the marriage market. If this is true, we would thus be able to see that higher education and late marriage are also positively related to the likelihood of a woman choosing, or contributing to the choice of, her husband. This is indeed what is shown in the second sets of results, based on the IHDS data.

The policy conclusions derived from these analyses are clear. As stated above, increasing both marital age and women's education should be among the main objectives for government interventions. More generally, a holistic approach not focusing only on women's education would probably help reduce domestic violence more and faster. Men's education is important, too. Indeed, increasing men's average education would achieve two purposes: i) reduce male backlash; and ii) increase the choice set for educated women. On the other hand, insisting with models considering labour market participation as the only or main form of empowerment might be counterproductive. It is likely that labour market improvements (i.e. salary and/or safety) could change the picture in the future, since India is growing fast. However, the role of women's employment at the moment is not as unambiguous as in most high income countries where the labour market is well regulated and less exploitative.

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Appendix

Table A1: Education differences and domestic violence, conditioning on women' education.

VARIABLES	<i>No and primary education</i>			<i>Secondary and higher education</i>		
	Less severe violence	Severe Violence	Sex violence	Less severe violence	Severe Violence	Sex violence
Education difference						
<i>Reference: Lower than husband</i>						
Same as husband	-0.004 (0.019)	-0.009 (0.012)	-0.001 (0.013)	-0.015 (0.013)	-0.003 (0.006)	0.003 (0.007)
Higher than husband	0.058* (0.032)	0.025 (0.021)	0.030 (0.022)	0.01 (0.011)	-0.004 (0.006)	0.005 (0.006)
Constant	0.471 (1.665)	-0.065 (0.997)	-1.248 (1.024)	0.917 (0.992)	-0.056 (0.488)	0.456 (0.579)
Observations	3,151	3,151	3,151	6,544	6,544	6,544

Table A2: Placebo regressions

VARIABLES	(1) Non-partner violence	(2) Non-partner frequency violence	(3) Teacher violence ever
Marital age	0.003 (0.02)	-0.012 (0.054)	-0.005 (0.007)
Constant	0.094 (0.580)	-2.980 (2.817)	-0.011 (0.191)
Observations	9,660	413	9,660
R-squared	0.021	0.176	-0.002

Table A3: Empowerment and role in choice of the husband (IDHS, 2015-2016)

	Chose Husband	Say in husband choice	Chose Husband	Say in husband choice
Marital age	0.014** (0.006)	0.029*** (0.007)		
Education			0.027** (0.012)	0.055*** (0.014)
Constant	0.04 (0.759)	-1.200 (0.846)	0.801 (0.772)	0.696 (0.912)
Observations	29,496	20,958	29,494	20,956