



Domestic Risk Factors, Violence and Marital Dissolution: Evidence from Demographic and Health Survey of India

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Abstract

The rising divorce rate in developing nations is a cause of concern among social scientists. Though women's ability to dissolve marriages in response to domestic violence can be observed as an agency, it has long been perceived as undesirable for society. The paper examines the complex association between domestic risk factors, violence, and the likelihood of marital dissolution. Using the fourth round of Demographic and Health Survey data, we unravel these relations in India, where domestic violence is extremely high compared to the divorce rate. We find that divorce incidences are rising among Indian women as a protest against domestic violence towards them. Marital dissolution is more common among the victims of severe physical violence and sexual violence than those of emotional violence or less severe violence. Economic empowerment in terms of land ownership and employment has helped the process of dissolving abusive marriages.

Keywords Marital dissolution · Domestic risk factors · Domestic violence · Women empowerment

JEL Classification J12 · J16 · J18

Résumé

L'augmentation du taux de divorce dans les pays en développement est une source de préoccupation parmi les scientifiques sociaux. Bien que la capacité des femmes à dissoudre les mariages en réponse à la violence domestique puisse être observée comme une agence, elle a longtemps été perçue comme indésirable pour la société. Le document examine l'association complexe entre les facteurs de risque domestiques, la violence et la probabilité de dissolution du mariage. En utilisant les données de la quatrième ronde de l'Enquête démographique et de santé, nous démêlons ces relations en Inde, où la violence domestique est extrêmement élevée par rapport

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au taux de divorce. Nous constatons que les incidents de divorce augmentent parmi les femmes indiennes en protestation contre la violence domestique à leur égard. La dissolution du mariage est plus courante parmi les victimes de violence physique grave et de violence sexuelle que parmi celles de violence émotionnelle ou de violence moins grave. L'autonomisation économique en termes de propriété foncière et d'emploi a aidé le processus de dissolution des mariages abusifs.

Resumen

El creciente índice de divorcios en los países en desarrollo es motivo de preocupación entre los científicos sociales. Aunque la capacidad de las mujeres para disolver matrimonios en respuesta a la violencia doméstica puede ser observada como una agencia, ha sido percibida durante mucho tiempo como indeseable para la sociedad. El documento examina la compleja asociación entre los factores de riesgo domésticos, la violencia y la probabilidad de disolución del matrimonio. Utilizando la cuarta ronda de datos de la Encuesta Demográfica y de Salud, desentrañamos estas relaciones en India, donde la violencia doméstica es extremadamente alta en comparación con la tasa de divorcio. Encontramos que los incidentes de divorcio están aumentando entre las mujeres indias como protesta contra la violencia doméstica hacia ellas. La disolución del matrimonio es más común entre las víctimas de violencia física severa y violencia sexual que entre las de violencia emocional o violencia menos severa. El empoderamiento económico en términos de propiedad de tierras y empleo ha ayudado en el proceso de disolver matrimonios abusivos.

Introduction

Does domestic violence cause marital dissolution?—The sharp contrast in the incidences of domestic violence and the divorce rate in India makes us wonder whether women can exit abusive marriages. Crime against women stands at 588 cases per million population, of which 31.9% are registered under the ‘cruelty by husband or his relatives’ (National Crime Records Bureau 2018) in India, contrary to the divorce rate of 1.2% (United Nations 2020a). *Domestic violence* is defined as coercive behaviors in a relationship where a partner uses power and control over the other partner over a period of time (Danis and Bhandari 2010). It is used to dominate and control women within the context of intimate relations (Clowes et al. 2010). To deal with the same, divorce or separation has been observed as an effective coping strategy for battered women (Kelebek-Küçükarslan and Cankurtaran 2022; Ellsberg et al. 2001; Rosen and Stith 1993). The paper examines whether women’s response to domestic violence leads to rising divorce incidences in trans-formational patriarchal countries where recent government policies have targeted women’s empowerment.

The battered women, however, might not exit their marital ties. Society imposes several restrictions on a woman’s decision to dissolve the marriage (Khataybeh 2022; Akhter et al. 2022; Qamar and Faizan 2021; Saraswati 2020; Brandwein et al. 1974). We state two prominent reasons women might decide to continue their



marriage despite being a victim of domestic violence. Firstly, divorced¹ women are often looked down upon and blamed for their incapability of maintaining the marriage (Khataybeh 2022; Khan and Hamid 2021; Qamar and Faizan 2021; Thomas and Ryan 2008; Brandwein et al. 1974). Since their childhood, they inculcate that they are responsible for the reputation of their in-laws. Hence, they feel immense psychological pressure to preserve their marriages at any cost. Even community leaders and the government persuade the women to cope with the abuse. Divorced women feel the stigma even from close associates and are made to feel ashamed. Choosing to end marital relations, therefore, lowers their self-esteem drastically. Secondly, divorced women need financial and emotional support as they are not accepted in their paternal home and society (Kelebek-Küçükarslan and Cankurtaran 2022; Qamar and Faizan 2021; Hocaoglu and Yalcinkaya 2020; Rathi and Pachauri 2018). The abused women must consider these costs to evaluate their net well-being from dissolving their marriages. The current paper is an attempt to evaluate the status of women empowerment in India in terms of their agency to dissolve abusive marriages. If the benefits of dissolving abusive marriages outweigh the cost, the women would dissolve their marriages.

The rising divorce rates against the backdrop of high domestic violence makes India an ideal case for this study. India is one of the countries that score poorly in terms of gender equality.² The patriarchal nature of Indian society restricts the freedom of abused women to seek a divorce, which is evident from the divorce rate at a mere 1.2%, even though non-marriage is extremely rare. Also, the time involved in resolving the divorce cases over the court acts as a barrier to undergoing legal divorce in India. Only recently has India seen a notable increase in the number of divorces. The number of divorces has doubled in the past two decades following the international trend (United Nations 2020a). Further, several women choose to stay separated until they get divorced legally.³

While there is a need to support separation and divorce in repeated incidences of DV, it is essential to eliminate DV. The most conventional way is to empower women through education and financial empowerment. However, there can be other ways, like improving the balance of power within the household. An overly rigid and restrictive husband and his use of alcohol may guide him to be violent towards his partner. Maintaining a healthy lifestyle by avoiding the use of alcohol and being more friendly and less restrictive on their partner might reduce the likelihood of committing violence. We also test this hypothesis using nationally representative household data from India.

¹ We refer to both divorce and separation as divorce henceforth.

² The United Nations ranked India 127th out of 160 countries in the Gender Inequality Index in 2017 (United Nations 2020b) and 112th in the annual Gender Gap Index for 2020 among 153 countries (World Economic Forum 2020) based on economic participation and opportunity, educational attainment, health and survival, and political attainment.

³ Therefore, divorce and separation indicate a willingness to exit the marriage.



If the above hypothesis is true, the bride's family might choose the groom selectively based on these traits.⁴ The match-making parameters in marriages would require a drastic transformation to reduce DV and, thereby, marital dissolution. Matching in traditional, low and middle-income countries like India are based on dowry (Weaver and Chiplunkar 2022; Anderson and Bidner 2015), ethnicity, and appearance (Keskar 2021; Murasko 2020), whereas the critical characteristics of the bride and groom such as their lifestyle, nature, and psychology are left aside. Groom selection has assumed even greater importance since an unmarried girl is perceived to be a curse, as is evident from rare incidences of non-marriage of girls in India (United Nations 2020a). It seems that unless the overly rigid, restrictive, and alcoholic grooms remain unmarried forever, the incidences of DV cannot be checked adequately.

In a typical patriarchal society like that of India, once a woman enters a marital contract with an overly restrictive and alcoholic man, she tries to change her partner's attitude towards her and initiate a healthy lifestyle for him (Sukeri and Man 2017; Chowdhury et al. 2006). If the husband cannot restrain his attitude, he gradually turns violent on his partner. Women who are not adequately empowered might be unable to dissolve the abusive marriage by challenging the social barriers and continue to face violence⁵ that may even cause permanent damage.⁶ The capability to dissolve abusive marriages is thus an important agency that seems to have been at stake from the raw statistic (divorce rate of 1.2%). Therefore, our attempt to examine whether domestic violence or the magnitude of the same leads to marital dissolution is essential to highlight the status of women's empowerment in India. It is also of interest to the government as the results would also throw light on the efficiency of the different women empowerment programs run by the Indian government, such as Beti Bachao Beti Padhao, One-Stop Centre, Women Helpline and Nirbhaya targeted towards ending violence against women.

This paper examines the net effect of these opposing forces⁷ that might lead to marital dissolution due to DV. Though our empirical analysis relates specifically to India, the scenario is quite similar in almost all the South-Asian countries, which share a common culture and relatively higher incidences of domestic violence

⁴ 93% of the marriages in India are arranged. In contrast, only 3% of them are love marriages. Another 2% are love-cum-arranged marriages, meaning their families set up the relationship, and then the couple agreed to marry (Rukmini 2021).

⁵ Kelebek-Küçükarslan and Cankurtaran (2022) find that most divorce occurs within 5 years of marriage.

⁶ Among the women subjected to severe violence in India, 43.5% had bruises; 19% had eye injuries, dislocations, or burns; 14.8% had wounds, broken bones, or other serious injuries; 6.3% had severe burns. Almost 50% had gone through either of these due to their husbands' actions (Author's calculation from DHS-4 dataset).

⁷ By 'opposing forces,' we mean the factors that motivate abused women towards marital dissolution can be divided into two contradictory parts. Though it looks pretty simplistic that the victims of domestic violence are more likely to dissolve their marriages than their counterparts, the process is not very easy, especially in patriarchal societies. There are several cultural and psychological barriers to moving out of marriage, which we have discussed in detail. These barriers act as a counterforce that might discourage the victims from dissolving their abusive marriages and bearing with the violence.



compared to developed nations in the West. Countries in Europe, such as Lithuania, Latvia, and Sweden, have a relatively higher rate of divorce and, therefore, might represent a greater willingness of the women in these nations to exit domestic violence through divorce and separation compared to other European nations.

We contribute to the literature on marital dissolution in two main ways. The first is that we estimate the causal impact of domestic violence on marital dissolution in India. Most of the previous studies have found an association between divorce and violence alongside other contributing factors (Maiti 2023; Kumari 2016; Maitra and Gayathri 2015; Vasudevan et al. 2015; Kaneez 2015; Rao and Sekhar 2002). These studies, unlike our work, have used qualitative or mixed methods to study marital dissolution and associated factors. Our work presents a quantitative analysis and establishes the causal impact of domestic violence on marital dissolution. This is important because it brings to light that the agency of Indian women has improved substantially which explains the sudden rise in divorce rate in India very recently.

Second, most of the past studies are limited to particular geographical regions in India. We provide a holistic scenario using nationally representative data of India to provide robust evidence that abused Indian women resort to marital dissolution, suggesting that exiting the relationship is perceived as an act of resistance and a credible option to eliminate domestic violence throughout the nation. The findings indicate that Indian society is transforming, with more women deciding to counter and resist the violence towards them. Therefore, the recent rise in divorce rate should be explained as an effective resistance to domestic violence.

The paper is organized as follows: section “[Review of Literature](#)” discusses the background related to social barriers to marital dissolution, factors associated with domestic violence, and women empowerment, while we describe the data and measures of DV in section “[Data and Questionnaire](#)”. Section “[Empirical Estimation](#)” discusses the estimation methodology, followed by section “[Results](#)”, which presents the regression results. Finally, section “[Conclusion](#)” concludes the paper.

Review of Literature

Domestic violence, reaching the point of ultimatum, having adequate pre- and post-divorce support, concern for children’s welfare, seeking financial independence, and fear of harm have been the major causes of divorce (Waseem et al. 2020; Umar 2020; Sukeri and Man 2017). Associative matching based on income, wages, and education in the marriage market is well-established within the economics literature (Goni 2022; Siow 2015; Chiappori et al. 2012; Choo and Siow 2006; Pissarides 2000; Pencavel). Also difference in educational attainment (Maiti 2023; Girase et al. 2016), change in family structure (Rao and Sekhar 2002; Vasudevan et al. 2015), marrying at a young age (Kaneez 2015), lack of mutual trust and communication failure (Kaneez 2015; Ramachandrappa et al. 2016), involvement of kinspeople (Hussain 2014; Ngurthangpuii and Geetha 2017; Vasudevan et al. 2015), and physical and mental harassment by husbands (Kumari 2016; Maitra and Gayathri 2015; Kaneez 2015) are found to be largely associated with incidences of divorce in India.



Studies have found that Indian women file for divorce more often than their husbands (Maitra and Gayathri 2015; Vasudevan et al. 2015; Aripilackal and George 2015). Divorced women often blame their husbands for their divorce and never regret their decision to move out (Mattoo and Ashai 2012). Therefore, a significant proportion of marital dissolution in India has been due to the wives' decisions. However, the conclusions are based on ethnographic surveys, and no countrywide empirical evidence exists. Our work fills the gap and enriches this literature by providing robust evidence that abused Indian women resort to marital dissolution, indicating that Indian women has attained the agency to protect themselves and eliminate domestic violence.

Other aspects must also be considered while evaluating the net gains from dissolving abusive marriages. Economic empowerment is essential for battered women to lead a healthy life post-divorce. Economic empowerment also play an essential role in their decision to move out of abusive marriages (Kelebek-Küçükarslan and Cankurtaran 2022; Sanders and Schnabel 2006). Financial independence, witness of parental violence, and psychological factors also significantly influence battered women's decision to dissolve marriages (Kim and Gray 2008).

While discussing the barriers and other factors associated with battered women's decision to dissolve marriages, it is also essential to study the determinants of DV. Several studies have found a positive association between DV and women's unemployment (Fajardo-Gonzalez 2021; Anderberg, et al. 2016). Evaluating a fund transfer program targeted towards women in Mexico, Bobonis et al. (2013) find that those who have received the fund are 40% less likely to be victims of physical abuse. Contrary to the same, scholars have found that increasing the income or employment of women increases DV (Bhalotra et al. 2021; Manji et al. 2020; Bulte and Lensink 2019; Rahman et al 2011). Fajardo-Gonzalez (2021) argues that the positive association between intimate partner violence and women's employment serves as a channel to enhance their financial autonomy and potentially exit abusive relations. Still, others find that women's employment has no causal effect on marital violence (Lenze and Klasen 2017). Schuler and Nazneen (2018) find that women's earnings, perceived exit options from abusive marriages, and community members' intervention in incidences of DV play determining roles in women's bargaining power in the household.

Women's land ownership reduces DV incidences perpetrated on them (Panda and Agarwal 2005; Oduro et al. 2015). In contrast, Gahramanov et al. (2021) find that joint ownership of assets, compared to autonomous ownership, induces women to supply labor for household production voluntarily, thereby reducing violence against them. Similarly, there is no consensus on the role of education in women's empowerment. While Kimuna and Djamba (2008) find a positive relationship between women's education and the violence caused to them, Rahman et al. (2011) find a negative association. Exploiting a change in compulsory schooling law, Erten and Keskin (2018) do not find any change in physical violence due to increased education among rural women. The current paper evaluates the role of these factors in recent incidences of domestic violence and marital dissolution in the Indian context.

Among other associated factors, prevalent discriminatory gender norms significantly deter domestic violence (Samuels et al. 2019). Low household wealth and



urban residence are also associated with a higher likelihood of DV (Rahman et al. 2011). Domestic violence is also caused by stress from lack of wealth (Heath et al. 2020) and conflict over dowry payments or extraction (Menon 2020). The use of alcohol is positively associated with DV (Kimuna and Djamba 2008; Chowdhury et al. 2018; Luca et al 2019; Bhatta et al. 2021). Partner's jealousy and controlling behavior are also positively associated with intimate partner violence (Mondal and Paul 2021).

While almost every piece of literature indicates a robust unidirectional association between the husband's use of alcohol, controlling behavior, and DV, there is no consensus on the role of women's employment, education, and autonomous ownership of assets. Their influence varies with the underlying cultural and societal norms. In the context of India, reasons for DV vary within states. In rural Maharashtra, women's financial inclusion reduces DV, but their employment does not significantly impact the same (Raj et al. 2018). Bhattacharyya et al. (2011) find that women's paid employment and property ownership are associated with reduced marital violence in rural Uttar Pradesh. Similarly, Panda and Agarwal (2005) argue that women who own immovable properties (e.g., land, house) face less violence in Kerala. We consolidate the unidirectional association between domestic risk factors and domestic violence. The broad consensus in the association of domestic violence with the husband's use of alcohol and his controlling behavior has motivated us to use them as instruments for domestic violence in our estimation strategy.

There is a dearth of literature within the purview of economics that has studied the causal impact of DV on the likelihood of marital dissolution. Therefore, it is critical to identify if women in India resort to marital dissolution in response to domestic violence, as numerous factors limit their freedom to obtain a divorce. Also, the literature in sociology, gender studies, and other associated fields has mainly relied on qualitative surveys. Our study is novel in that we establish that women in India are gaining the agency to dissolve abusive marriages, overcoming the multidimensional barriers using a large-scale representative dataset.

Data and Questionnaire

The data used for our analysis is extracted from the fourth round of a nationally representative comprehensive survey, Demographic and Health Survey (DHS), 2015–2016. The women questionnaire of the survey collects detailed information on the individual characteristics like age, education, employment status, and household characteristics such as caste, religion, and wealth index of women within the age group 15–49 years. The domestic violence module and husband characteristics are also covered under this section.

Only one eligible woman per household was randomly selected for the domestic violence module, and the module was implemented if privacy could be obtained following the World Health Organization's guidelines on the ethical collection of information on domestic violence. Of the 83,397 women selected for the domestic violence questions, 79,729 completed the module. Only 4% of women eligible for the domestic violence module could not be successfully interviewed with the module



because privacy could not be obtained or for other reasons. Hence, underreporting is not a credible threat to our analysis.

We use a subsample of 66,013 women who were interviewed for the domestic violence module to adjust for the missing values of the variables used in the model. We consider only the currently married, the divorced, or the separated women and exclude the widows. We have a final sample of 62,974 women who are either currently married or divorced/separated and for whom we have complete information on domestic violence, partner characteristics, women empowerment, and other demographic variables included in our analysis.

Domestic Violence and Marital Dissolution Variables

Women selected for the domestic violence module were asked if their (last) husband ever humiliated, hurt, or harmed, insulted her, pushed/shook/throw something at her, twisted her arm/pulled her hair, slapped, punched, kicked, dragged, tried to choke or burn her, threatened/attacked with a knife, gun, or any other weapon, physically forced her to have sexual intercourse, forced her to perform any other sexual acts, forced her with threats or in any other way to perform sexual acts. The recorded responses took 0 for 'never,' 1 for 'yes, but not in the last 12 months', 2 for 'sometimes', and 3 for 'often.' We create an index for 'domestic violence' by summing all the recorded thirteen responses to the detailed categories of violence. The resultant domestic violence index is, thus, a continuous variable ranging from 0 (indicating no violence) to 39 (indicating the highest intensity of violence across all thirteen categories). In the same way, we also create separate indices for the constituent violences: emotional violence (EV) (first 3 questions) with a range of 0–9, less severe violence (LSV) (following 4 questions) with a range of 0–12, severe (physical) violence (SPV) (following 3 questions) and sexual violence (SV) (following 4 questions) each with a range of 0–9.

Our outcome variable, 'Marital dissolution,' takes 1 if the respondent is either divorced or separated and 0 if currently married. We club the incidences of separation and divorce into 'marital dissolution' since both reflect their agency to exit marriages.⁸

Domestic Risk Factors

We measure domestic risk factors across two broad dimensions: (1) the controlling behavior of the husband/partner and (2) the partner's use of alcohol. Respondents were asked if her (last) husband would be angry if she (talk /talked) to other men, if he frequently (accuses/accused) her of being unfaithful, if he (tries/tried) to limit her contact with her family, if he (insists/insisted) on knowing where she (are/were)

⁸ Clubbing them together increases the sample of women who have been able to dissolve their marriages. It is important because the incidences of separation and divorce individually are still quite low in India.



all the time and if he (does/did) not trust her with any money. These responses are dummies where 1 indicates *yes* and 0 indicates *no*. We consider the sum of these responses to denote the number of controls imposed on them. To capture the partner's use of alcohol, we exploit the response to if her (last) husband (drinks/drank) alcohol.

Empowerment Variables

We consider empowerment across two different broad dimensions: economic empowerment and education. We determine economic empowerment through ownership of land and employment status. We consider ownership of land alone or jointly with someone else as 'land ownership'. While ownership of land indicates the wealth of the respondents, employment status shows if she has a constant flow of income. We consider 'Secondary education' as a proxy for education that takes the value 1 if the respondent has completed her secondary education and 0 otherwise.

Empirical Estimation

We use a two-equation system to estimate the relationship between our primary outcome variable of interest, marital dissolution (MD) and domestic violence (DV). In the two-equation system, MD is directly affected by DV, which is affected by domestic risk factors.

The empirical framework of the model is given below:

$$MD_{is} = \alpha_0 + \alpha_1 DV_{is} + \alpha_2 EMP_{is} + \alpha_3 X_{is} + \theta_s + u_{is} \quad (1)$$

$$DV_{is} = \beta_0 + \beta_1 DRF_{is} + \beta_2 EMP_{is} + \beta_4 X_{is} + \theta_s + v_{is} \quad (2)$$

In the first equation, the MD of women i in state s can take either 1 or 0, representing if she has dissolved her marriage (divorced or separated) or is currently married. MD is explained by DV, empowerment (EMP_{is}) variables, and a set of exogenous variables, X_{is} . In the second Equation, DV is explained by domestic risk factors (DRF_{is}), empowerment (EMP_{is}) variables, and the same set of exogenous variables (X_{is}) like age, adjusted age-square, whether son(s) and daughter(s) live with her in the household.⁹ To account for the possible state-level variation in the cultural practices and other possible covariates affecting the incidences of MD, we introduce state-fixed effects¹⁰ (θ_s) in both Eqs. (1) and (2). The standard errors are clustered

⁹ Marriage in India often occurs among equals in terms of ethnicity, region of residence, household wealth, and household size. Therefore, we do not expect the divorced or separated women to be systematically different from those currently married in terms of the socio-economic parameters pre- and post-marriage. However, incidents of domestic violence and divorce might correlate with such characteristics.

¹⁰ The data agency (International Institute of Population Sciences) identifies the dataset to be a true representative only at the state level, though they have provided district identifiers. Moreover, there are 640 districts in the dataset, with some districts having less than 50 samples. In comparison, we have 36 states, and the sample size from each state is proportional to each state's actual population; therefore, all states



at the district level.¹¹ Our interest is to find the parameter estimates of α_s and β_s . We allow contemporaneous correlations across Eqs. (1) and (2). The equations are estimated simultaneously, and the errors follow a multivariate normal distribution.

$$\epsilon = [u_i, v_i] \sim N(0, \Sigma) \text{ and } \Sigma = \begin{bmatrix} 1 & \rho\sqrt{\sigma_{22}} \\ \rho\sqrt{\sigma_{22}} & \sigma_{22} \end{bmatrix}$$

We use the endogenous probit method to empirically estimate the joint likelihood function, which takes account of the contemporaneous correlation between the first-stage and second-stage regressions.¹² The inclusion of domestic risk factors makes the two-system equation model identifiable.

Our model advances the model used in Chowdhury et al. (2018), whereby we have introduced state-fixed effects. Chowdhury et al. (2018) estimated the effect of domestic violence on health injuries using the same dataset for Nepal. Our model attempts to establish a causal relationship between domestic violence and marital dissolution. We add state-fixed effects as the tradition and cultural norms vary widely across states in India. Controlling for state-fixed effects takes a step closer to identifying the true parameter estimate.

It is essential to address the identification issues involved in estimating the causal effect of domestic violence on the likelihood of marital dissolution. Domestic violence and women empowerment depend to a certain extent on the prevalent cultural norms within the particular society in which an individual resides. The cultural norms in India are diverse given the diversity of the population in India in terms of the local language,¹³ caste, creed, and religion. We have included the state-fixed effects in our model to control for the omitted variable bias arising from unobserved inter-state variation in the cultural and patriarchal norms. The cultural and patriarchal norms are expected to affect both the incidences of marital dissolution and domestic violence. Therefore, controlling for these unobserved characteristics through state-fixed takes us closer to estimating the true impact of domestic violence. Again, one might suspect that the incidence of domestic violence is not random and, hence, is endogenous to the model described in Eq. (1). Towards this

Footnote 10 (continued)

are adequately represented with proper weightage in the dataset. Hence, we consider state-fixed effects instead of district-fixed effects. Also, since most states are formed on the basis of differences in linguistics and culture, we presume controlling for state-fixed effects captures the unobserved heterogeneities in culture and norms surrounding domestic violence and marital dissolution.

¹¹ We prefer to cluster the standard errors at the district level to control for any plausible inter-district heterogeneity. Clustering the standard errors at the smallest group identifier is also an established norm. Clustering the standard errors at a larger dimension—state increases the significance of domestic violence marginally without affecting the effect size. Since the coefficients of DV are already highly significant, we prefer to cluster the standard errors at the district level, which is a granular identifier than the state.

¹² The regression is done using a Conditional Mixed Process (CMP) estimator package written and created by Roodman (2011). This estimator can be applied in models where the structure of the data shows a truly recursive data-generating process. The CMP approach assumes that the errors in all the equations follow a Gaussian distribution and that the system of Equations is perfectly recursive.

¹³ 121 languages are spoken in India.



end, we have introduced a two-equation simultaneous model whereby we consider domestic violence to be determined by domestic risk factors such as whether the husband uses alcohol and how restrictive he is. Domestic risk factors are expected not to affect the incidences of women resorting to divorce/separation directly for several reasons. Alcohol consumption is typical among Indian males, irrespective of socio-cultural and economic status. Also, India is patriarchal; males have always dominated household relations, and their restrictive nature is widely appreciated. However, husbands' use of alcohol and their restrictive nature affect the incidences of marital dissolution only through the perpetration of domestic violence. Our model thus identifies domestic violence as exogenous in Eq. (1). In order to check the robustness of the model and address the identification concern, we also test the model rigorously using different specifications of the model delineated in models 1, 2, and 3.

Domestic risk factors, which include the husband's controlling behavior and use of alcohol, are exogenous to the effect of DV on the women's decision to dissolve marriages. Unlike other factors associated with DV, the literature has established a unidirectional positive and direct association between the husband's controlling behavior and the use of alcohol with DV. Consumption of alcohol is also typical among women in India (Mishra et al. 2022; Chari et al. 2012) and, therefore, does not directly influence their decision to exit marriages. On the other hand, it has been observed that abused women most often seek help from their birth families, friends, and neighbors (Coker et al. 2000) before approaching organizations. Ergöçmen et al. (2013) report that while 35% of the battered women shared the violence inflicted on them with birth families and 23% of them shared it with friends or neighbors, a mere 8.4% sought help from institutions. Restriction on the spouses is thus a risk factor directly associated with domestic violence. However, these risk factors for DV do not directly influence the likelihood of MD and are, therefore, exogenous.

We estimate three different models with different specifications. In the first model, we estimate Eq. (1) using DV, women empowerment, and the socio-demographic variables, and Eq. (2) is estimated using domestic risk factors, women empowerment, and the socio-demographic variables. We add covariates explaining DV and MD in the second and third models. In the second model, we introduce inhibiting factors and cultural dimensions to explain DV. In the third model, we also introduce these factors to explain MD.

We use several sensitivity analyses to verify the validity of our main results. First, we use an ordinary least square (OLS) specification where Eqs. (1) and (2) are estimated individually. Second, we use the first factor of the principle components model (PCA) to calculate DV and estimate our original models. Third, we introduce DV in the two-equation set-up as a dummy variable to indicate if the respondents have ever been subjected to violence by their partner.

To capture the relative effect of various dimensions of DV—emotional, less severe physical, severe physical, and sexual violence, we estimate the model using each of these dimensions individually in place of DV. The higher the α_1 coefficient, the higher the dimension's effect on the likelihood of MD. Additionally, all the computational measures of DV, that is, the additive index, the first factor of PCA, and the dummy variable approach have been implemented on each of the dimensions



Table 1 Descriptive statistics

Variables of interest	Mean	Std. Dev.	Min	Max
Marital dissolution (MD)	0.014	0.119	0.000	1.000
Domestic violence (DV)	1.875	4.239	0.000	39.000
Components of DV				
Emotional violence	0.423	1.318	0.000	9.000
Less severe violence	1.035	2.142	0.000	12.000
Severe violence	0.191	0.769	0.000	9.000
Sexual violence	0.226	1.004	0.000	9.000
Indicators of DV				
Domestic violence dummy	0.318	0.466	0.000	1.000
Emotional violence dummy	0.126	0.332	0.000	1.000
Less severe violence dummy	0.279	0.449	0.000	1.000
Severe violence dummy	0.081	0.272	0.000	1.000
Sexual violence dummy	0.066	0.249	0.000	1.000
Partner imposed restrictions				
Jealous	0.250	0.433	0.000	1.000
Accuses	0.080	0.271	0.000	1.000
Limits	0.144	0.351	0.000	1.000
Insists	0.198	0.399	0.000	1.000
Trusts	0.233	0.423	0.000	1.000
Partner's use of alcohol	0.313	0.464	0.000	1.000
Economic empowerment				
Land ownership	0.318	0.466	0.000	1.000
Employed (ref: unemployed)	0.682	0.466	0.000	1.000
Indicator for education				
Secondary education dummy	0.528	0.499	0.000	1.000

MD includes those ever-married women who are currently divorced/separated. DV index is constructed by adding the responses to 13 items on a scale of 0–3, where 0 denotes no violence and 3 denotes often subjected to violence

of DV separately. We also assessed our primary findings based on the respondents' psychological construct exploiting the response to questions regarding if, in their opinion, a husband is justified in hitting or beating his wife in specific situations. Finally, we include wealth index and household size as additional controls in our model to check the precision of α and β estimates.

Results

Summary Statistics

Table 1 presents the summary statistics of the main variables used in the study. While the incidence of marital dissolution (MD), which includes both divorce and



separation, is 1.4%, 31.8% of the sample respondents report some domestic violence (DV). While 27.9% of respondents report some less severe violence, 12.6% report some emotional violence, followed by 8.1% reporting some variant of severe physical violence and 6.6% reporting some variant of sexual violence.¹⁴ The Cronbach's alpha value measuring scale reliability coefficient of the additive DV index is 0.88 for the standardized mean of the detailed component items. It shows that the detailed component items of DV are internally consistent.

We present a kernel density plot of the distribution of the additive DV index in Fig. 1. It is a positively skewed curve ranging from 0 (no violence) to 39 (maximum possible violence).¹⁵ Figure 2 presents a graphical illustration of the variation in the intensity of emotional violence, less severe violence, severe violence, and sexual violence by their current marital status. We find that divorced/separated women are exposed to thrice the intensity of DV borne by currently married women across all the dimensions.¹⁶

Endogenous Probit Regression Main Results

Table 2 presents the results of the endogenous probit models. The parameter values for Eq. 1 (MD) are presented first, and the parameter values for Eq. 2 (DV) are presented subsequently. As stated earlier, we have three alternative specifications of the stated model, which are presented in order.

Looking at the impact of DV on marital dissolution, we find that there is a significant impact of DV on MD across all the models. The z -score increases by 0.136, 0.137 and 0.142 for a unit increase in the intensity of DV in respective models. To develop a better understanding, Fig. 3 presents the predicted probabilities of MD across various intensities of violence, using parameter estimates of Model 3. We see a non-linear positive relation between DV and MD. At a shallow level of DV (less than 10), likelihood of MD is less than 10%. The probability of MD increases at an increasing rate up to 20 on the DV index and thereafter it increases at a decreasing rate. The falling likelihood of increase in MD hereafter hints at the passive acceptance of violence by women despite being subjected to numerous forms of violence repeatedly. This result is aligned with the pattern of divorce incidences in Turkey, where most divorce takes place within 5 years of marriage (Kelebek-Küçükarslan and Cankurtaran 2022).

We find that domestic risk behavior, like the husband's restrictive behavior and use of alcohol, is significantly associated with DV across all three models. The extent of DV increases significantly with the number of husband-imposed restrictions. Alcohol usage by husbands also increases the extent of DV on them.

¹⁴ The summary statistics of the control variables and each of the detailed components of DV are presented in Online Appendix Tables A1 and A2, respectively.

¹⁵ Kernel density plots of the various constituent dimensions of DV are available in Fig. A1 in the Online Appendix.

¹⁶ An illustrative graph showing the incidence of at least one of the items in each constituent dimension is available in Fig. A2 in the Online Appendix.



Table 2 Probit estimates—effect of domestic violence on marital dissolution

Variables of interest	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1		Model 2		Model 3	
	MD	DV	MD	DV	MD	DV
Endogenous						
DV	0.136*** (0.006)		0.137*** (0.006)		0.142*** (0.006)	
Domestic risk factors						
Partner imposed restrictions		1.342*** (0.031)		1.335*** (0.031)		1.335*** (0.031)
Partner's use of alcohol		1.732*** (0.054)		1.764*** (0.054)		1.765*** (0.054)
Empowerment						
Economic empowerment						
Land ownership	-0.097*** (0.035)	-0.197*** (0.045)	-0.098*** (0.035)	-0.186*** (0.044)	-0.086** (0.036)	-0.187*** (0.044)
Employed	-0.247*** (0.032)	-0.517*** (0.042)	-0.246*** (0.032)	-0.518*** (0.042)	-0.268*** (0.033)	-0.517*** (0.042)
Secondary education	0.052* (0.030)	-0.557*** (0.039)	0.051* (0.030)	-0.490*** (0.039)	0.008 (0.032)	-0.482*** (0.039)
Inhibiting factors						
Son at home				-0.020 (0.036)	-0.567*** (0.030)	0.062* (0.034)
Daughter at home				0.033 (0.031)	-0.463*** (0.034)	0.091*** (0.030)
Religion (ref: Hindu)						
Muslim				0.445*** (0.069)	0.244*** (0.048)	0.414*** (0.070)
Christian				0.131 (0.097)	0.202*** (0.067)	0.104 (0.098)
Others				-0.192** (0.082)	0.056 (0.079)	-0.192** (0.082)
Caste (ref: general)						
SC				0.370*** (0.058)	-0.057 (0.056)	0.374*** (0.058)
ST				0.106 (0.070)	-0.113* (0.060)	0.119* (0.071)
OBC				0.020 (0.048)	-0.004 (0.046)	0.019 (0.049)
No caste/tribe				0.135 (0.093)	-0.002 (0.078)	0.133 (0.096)
Age	-0.028**	0.057***	-0.028**	0.058***	0.085***	0.041**



Table 2 (continued)

Variables of interest	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1		Model 2		Model 3	
	MD	DV	MD	DV	MD	DV
	(0.014)	(0.016)	(0.014)	(0.017)	(0.015)	(0.016)
Adj-age squared	0.052**	-0.083***	0.052**	-0.082***	-0.110***	-0.058**
	(0.020)	(0.023)	(0.020)	(0.024)	(0.022)	(0.024)
Urban locality (ref: rural)	0.130***	0.023	0.130***	-0.004	0.095***	0.003
	(0.031)	(0.044)	(0.031)	(0.044)	(0.033)	(0.044)
Observations	62,974	62,974	62,974	62,974	62,974	62,974
Log likelihood	-175,113.5		-175,037.5		-174,718.4	
Chi-squared	2,537,260.26		2,943,894.35		1,559,289.95	
AIC	350,389.1		350,255		349,634.8	
BIC	351,122.1		351,069.6		350,530.8	
Rho	-0.37727		-0.3810818		-0.3923222	
	(0.0247344)		(0.0257952)		(0.0249744)	

In the first model, we estimate Eq. (1) using DV, women empowerment and the socio-demographic variables and Eq. (2) is estimated using domestic risk factors, women empowerment and the socio-demographic variables. In the second and third models, we add additional covariates that explain DV and MD. In the second model, we introduce inhibiting factors and cultural dimensions to explain DV. State fixed effects are included in all regressions. The standard errors are clustered at the district level

*, ** and *** denote significance at 10%, 5% and 1% level of significance respectively

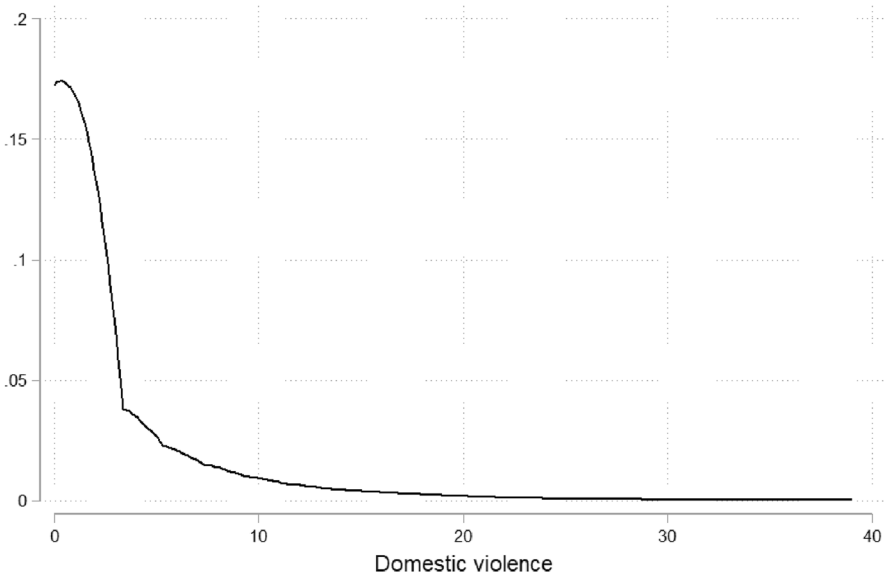


Fig. 1 Kernel density plot of DV



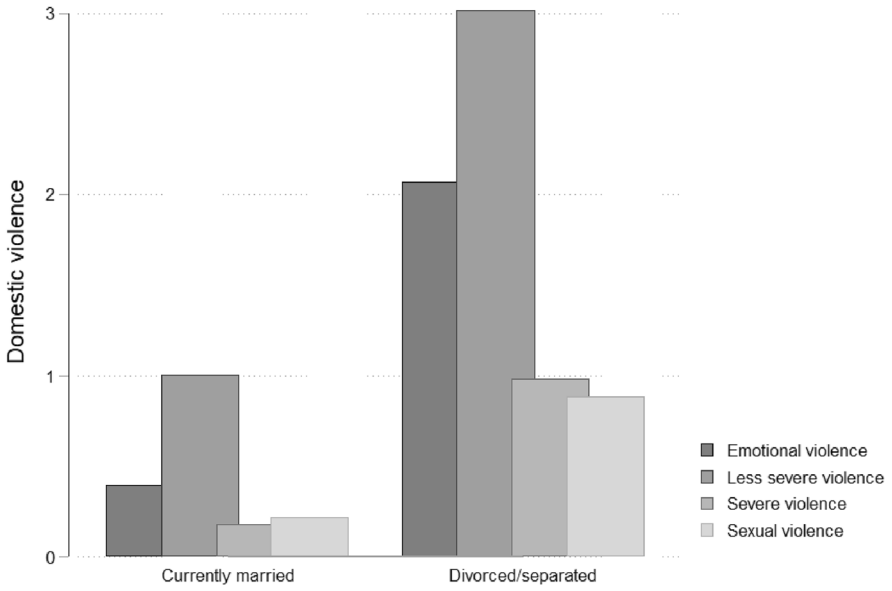


Fig. 2 Constituent dimensions of domestic violence by current marital status

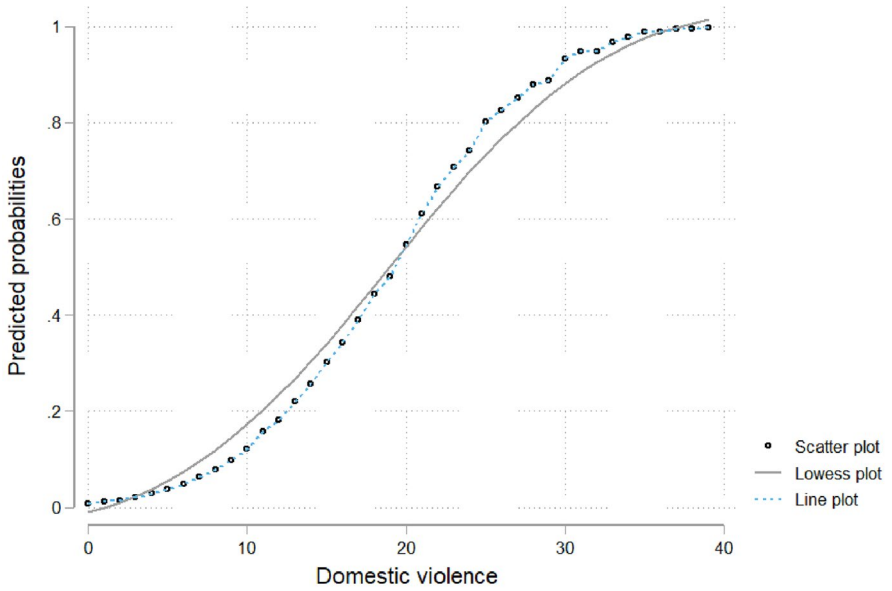


Fig. 3 Marital dissolution versus domestic violence



From the results of *Model 1*, we find that economic empowerment and education indicators are negatively associated with DV. Ownership of land, being employed as against not being in the workforce or searching for a job, and being educated up to secondary or beyond reduces DV significantly. Economic empowerment and education are also associated with a lower likelihood of MD, though the association is weakly significant for education. Age has a quadratic relation with DV as the latter increases with age but at a diminishing rate—the likelihood of the MD reduces increasingly with age. The region of residence, whether rural or urban, does not matter for the perpetrators of DV. This result is counter-intuitive as one would expect DV to be more prevalent in rural areas since rural societies are often perceived to be more patriarchal. Incidences of MD is prominent among women residing in the urban locality, indicating that neighborhood matters for women's agency to dissolve marriages. The relevance of the results draws support from the resource control theory widely discussed in the sociology literature. The theory explains how individuals (husbands) indulge in strategies with varying degrees of prosocial and coercive intent to attain social resources and, thereby, social dominance (Hawley 1999). The theory has highlighted economic abuse, such as controlling finances and restricting access to money to gain social control and dominance. Our findings align with the theory in that the husbands use several restrictive mechanisms to control their wives through being jealous if their wives interact with other men, accusing them of being unfaithful, not even allowing them to meet their female friends, always enquiring about their whereabouts and not trusting them with money. This restrictive mindset essentially urges them to be violent with their partner. The control theorists have highlighted how the financial dependence of both victim and perpetrator causes domestic violence. Economic empowerment of women creates vulnerability of women as the social norm of South Asian countries like India nurtures men as bread earners. However, our finding suggests that these patriarchal norms of the society are transforming as land ownership, employment, and education empower Indian women, reducing the extent of domestic violence on them and, thereby, their likelihood to dissolve marriages, which is contrary to what the theory predicts.

In *Model 2* and *Model 3*, we incorporate the inhibiting and the cultural factors. From the results of *Model 3*, we find that the presence of both sons and daughters increases the extent of DV, the association being weakly significant for the presence of sons. The likelihood of MD, however, significantly reduces if any of her sons and daughters live with her. Cultural factors are also associated with the extent of DV and MD. The results of *Model 3* show that while DV is significantly higher among Muslims and low among the 'other' religions compared to Hindus, MD is significantly higher among Muslims and Christians compared to Hindus. Along the caste lines, while women from the SC and ST communities suffer more in terms of DV, ST women are less likely to dissolve abusive marriages than the general caste women.¹⁷

¹⁷ Conducting several heterogeneity analyses (for detailed discussion, see Online Appendix), we identify secondary education and social mobility mediate divorce incidences. The likelihood of divorce is significant among abused women belonging to the advantaged caste group. The presence of a male child in the household reduces the likelihood of divorce among Indian women. The results are presented in Online Appendix Tables A3 and A4.



Table 3 Probit estimates—effect of constituent dimensions on marital dissolution

Variable of interest	Model 1	Model 2	Model 3
Marital dissolution			
Panel A: emotional violence			
Endogenous			
EV	0.460*** (0.019)	0.475*** (0.019)	0.475*** (0.019)
Observations	62,974	62,974	62,974
Log likelihood	−104,379.4	−104,329.2	−104,033.7
Chi-squared	1,348,238.34	1,041,462.85	941,541.51
Panel B: less severe violence			
Endogenous			
LSV	0.307*** (0.011)	0.305*** (0.012)	0.321*** (0.011)
Observations	62,974	62,974	62,974
Log likelihood	−133,167.4	−133,094.8	−132,777.2
Chi-squared	1.60e+07	4,354,096.71	1,876,235.61
Panel C: severe physical violence			
Endogenous			
SPV	0.961*** (0.035)	0.996*** (0.035)	0.989*** (0.034)
Observations	62,974	62,974	62,974
Log likelihood	−72,771.98	−72,704.38	−72,410.22
Chi-squared	143,736.62	124,190.55	140,987.01
Panel D: sexual violence			
Endogenous			
SV	0.760*** (0.025)	0.787*** (0.026)	0.779*** (0.025)
Observations	62,974	62,974	62,974
Log likelihood	−90,423.53	−90,377.7	−90,085.88
Chi-squared	123,159.23	75,266.70	104,116.11

See footnote of Table 2. The standard errors are clustered at the district level

*, ** and *** denote significance at 10%, 5% and 1% level of significance respectively

Endogenous Probit Regression: Decomposed Results

To understand which constituent dimensions of DV contribute more to MD, we estimate the stated two-equation model using emotional violence (EV), less severe violence (LSV), severe (physical) violence (SPV), and sexual violence (SV) indices separately—one at a time, in place of DV index in both Eqs. (1) and (2). The influence of EV on MD varies between 0.460–0.475 (z -score) across the three models, as reported in Panel A in Table 3. LSV causes MD to vary in the range of 0.305–0.321 across models, as reported in Panel B. These impacts, though significant, are much



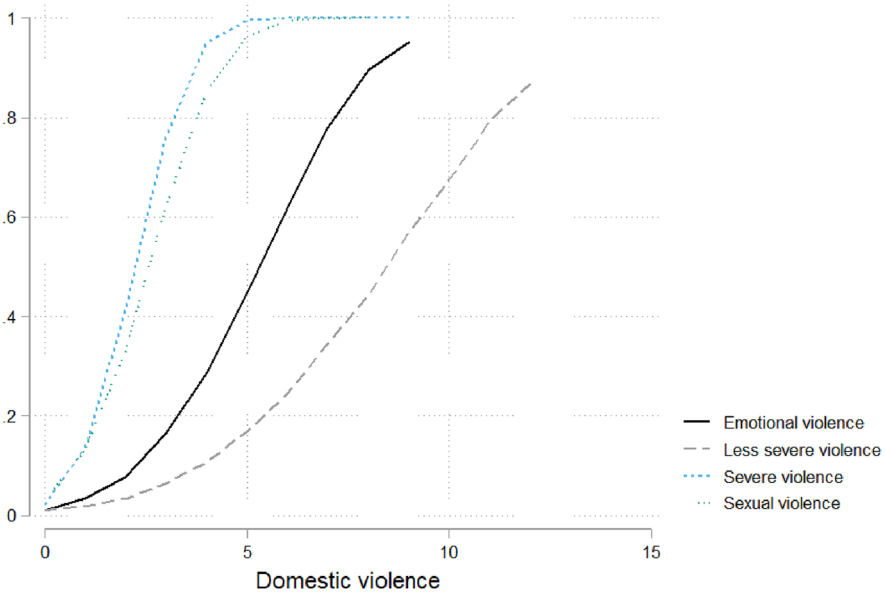


Fig. 4 Marital dissolution verses components of domestic violence

lower than that of the impacts of SPV and SV. The influence of SPV and SV varies to the extent of 0.961–0.996 and 0.760–0.787 across models, as shown in Panels C and D, respectively. SPV and SV thus pose a more significant threat to MD as they all most surely cause MD at their extremes.

To present a graphical view that makes the comparative analysis more straightforward, we plot the average predicted probabilities of MD resulting from the four separate constituent dimensions across various intensities of violence in Fig. 4. Across all intensities, the differential influence of EV, LSV, SPV, and SV is well-maintained, with SPV and SV far above EV and LSV. At 4 on the violence scale (varying from 0 to 9), SPV almost certainly causes MD as the predicted probability reaches 0.95. A similar likelihood of MD (0.96) concerning SV is attained at 5 on the violence scale (also varying between 0 and 9). The probability curves for SPV and SV become asymptotic to 1 at these respective points hereafter. In contrast, such a high probability is never attained for any level of LSV and EV.¹⁸

¹⁸ We have conducted an extensive sensitivity analysis and other robustness checks to validate these findings. These are discussed in Online Appendix.



Conclusion

The present paper shows that the recent rise in divorce incidences is due to the increased agency of Indian women to exit abusive marriages. The longstanding women empowerment policies seem to have achieved a milestone in delivering justice to the women who had been facing the wrath of domestic violence over the years. Financial empowerment via land ownership and suitable employment opportunities has helped women fight the odds related to marital dissolution. The women are more confident to subjugate the societal pressure related to marital dissolution backed by their rising education and financial status.

We find that marital dissolution has a positive and non-linear relation with DV, initially increasing at an increasing rate and then at a falling rate. The women empowerment programs in India have been instrumental in increasing women's agency to protect themselves by moving out of abusive relations. Women facing extremely severe physical violence and sexual violence almost surely dissolve their marriages. The effect of DV on MD varies significantly across the population, with women from advantaged castes having a higher effect size than those from disadvantaged caste groups, indicating that the latter continue to face the wrath of domestic violence. Therefore, localized interventions to empower these women from particular castes and tribes must be introduced. Local political and religious leaders must encourage the victimized women to protest against domestic violence and support them during and post-divorce.

The paper contributes to the existing literature on women's empowerment through establishing the causal impact of domestic violence on the decision to dissolve marriages. We find MD due to DV is mediated via risk factors such as husbands' restrictive nature and their use of alcohol. Examining the effect of different component dimensions of DV, we find that severe violence and sexual violence lead to MD more often than less severe violence and emotional violence. There exists a non-linear relation between DV and MD. The likelihood of MD increases at an increasing rate as the intensity of DV rises to mid-scale. After that, it increases at a diminishing rate, suggesting that it is not easy to move out of abusive marriages for all women.

Our analysis is limited by the cross-sectional nature of Demographic and Health survey data in the absence of panel structure data on domestic violence. The estimates drawn from panel data would be better positioned to provide a causal estimate of domestic violence on the likelihood of marital dissolution.

The paper is novel in several ways in terms of its methodology and empirical analysis. To our knowledge, this is the first paper to model DV and MD, especially via a two-stage joint estimation model. The robust empirical finding that Indian women can dissolve abusive marriages is the first of its kind. Our finding that the victims of severe physical violence or sexual violence resort to MD hints at the increased agency of Indian women. The causal impact of DV on MD in India provides an automatic encouragement to carry out further empirical research in other countries for the existence of a similar causal relation. We recommend that



concerted efforts be undertaken to uplift the status of women to reduce incidences of domestic violence and thereby contain the rising divorce rate.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1057/s41287-024-00628-x>.

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Data Availability This analysis was based on the National Family Health Survey data from India available in the public domain: <https://dhsprogram.com/what-we-do/survey/survey-display-355.cfm>.

Declarations

Conflict of interest The authors have no conflict of interest to declare.

Ethical Approval This analysis was based on the Demographic and Health Survey data from India available in the public domain. The data can be downloaded from www.DHSprogram.com. The study conducted a secondary analysis with no identifiable information on survey respondents.

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