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MALE EDUCATION AND DOMESTIC VIOLENCE IN TURKEY: EVIDENCE FROM A NATURAL EXPERIMENT

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Male Education and Domestic Violence in Turkey: Evidence from a Natural Experiment

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Abstract

We utilize a natural experiment, an education reform increasing compulsory schooling from five to eight years in Turkey, to obtain endogeneity-robust estimates of the effect of male education on the incidence of abusive and violent behaviour against women. We find that husband`s education lowers the probability of suffering physical, emotional and economic violence. The only aspect of violence not affected by spouse`s education is sexual violence. Schooling also lowers the likelihood that the marriage was arranged against the woman`s will, and makes men less inclined to engage in socially unacceptable behaviours such as drinking, gambling, and drug abuse. We also find that women whose mothers or whose husbands' mothers experienced domestic violence are more likely to suffer violence themselves.

Keywords: Education; Domestic Violence; Autonomy of Women; Difference-in-Difference-in-Difference; Instrumental Variable

JEL Codes: H52; I26; J12

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1. Introduction

Even though most countries have adopted formal rules to criminalise violence against women in recent years, the enforcement of such rules is often lacking and women remain on the receiving end of abuse. A recent report by the World Health Organization reports that 35 percent of women around the world have been abused physically and/or sexually.[3] Moreover, the most common form of violence against women is abuse inflicted by their own spouse (Garcia-Moreno, Jansen, Ellsberg, Heise, & Watts, 2006; Heise, Ellsberg and Gottemoeller, 1999).

In this paper, we study the determinants of spousal violence against women in the context of a developing country, Turkey, and are particularly interested in the role of male education. The incidence of domestic violence in Turkey appears negatively correlated with male education (see Section 3 and in particular Table 1). However, the inference in this context is hampered by the fact that both education and the propensity to engage in domestic violence can be driven by a third variable such as upbringing or cultural and social norms, leading to omitted variable bias. To get around this problem, we exploit a natural experiment as an instrument for schooling: a three-year exogenous variation in schooling induced by the Compulsory Education Reform (CER) implemented in Turkey in 1997. The reform increased the obligatory schooling from 5 to 8 years and improved access to education for the affected cohort (those born in or after 1987). We use data collected as part of the 2014 National Research on Domestic Violence against Women in Turkey (NRDVW) survey, which contains detailed information on the (female) respondents, their spouses, household characteristics, family background, and incidence of various kinds of domestic violence.

[3] World Health Organization (2013). Global and Regional Estimates of Violence against Women: Prevalence and Health Effects of Intimate Partner Violence and Non-partner Sexual Violence. Geneva. Switzerland.

Our study contributes the literature in several respects. First, to the best of our knowledge, ours is the first study to investigate the causal effects of spousal education on women's exposure to domestic violence. The previous literature typically considers the effect of female education on their experience of domestic violence. Second, besides considering domestic violence, we also investigate the effect of male education on marriage characteristics and on whether the husbands engage in controlling and socially unacceptable behaviour against their wives. Finally, we contribute to the literature on using natural experiments to examine the causal link between education and nonmarket outcomes.

We find that the husband's education reduces the incidence of most sorts of domestic violence, including economic, emotional and physical violence, but not sexual violence. The 2SLS estimates confirm this. Schooling also lowers the likelihood that the marriage was organized against the woman`s will and reduces the incidence of socially unacceptable behaviours such as drinking, gambling, drug abuse and alike, although the latter result is somewhat less precisely estimated. We also find that women whose mothers or whose husbands' mothers experienced domestic violence are more likely to suffer violence themselves.

The study proceeds as follows. Section 2 contains the literature review. Section 3 the compulsory education reform. Sections 4 and 5 describe the data and empirical strategy. Section 6 presents the results and discusses the findings. Lastly, Section 7 concludes.

2. Literature review

2.1 Education Effect

The previous literature mainly investigates the causal effect of female education on various outcomes. Osili and Long (2008) for Nigeria and Breierova and Duflo (2004) for Indonesia find that educated women have lower fertility rates. Mocan and Connanier (2012) find that schooling improves women`s attitudes towards risky health behaviours and reduces their

tolerance of violence. Women`s education also decreases the desired number of children and raises the usage of modern contraception methods (Mocan & Connanier, 2012; Samarakoon & Pariduri, 2015). On the other hand, there seems to be no relationship between women`s education and their authority in decision-making (except savings), ownership of assets (apart from jewellery and household appliances) and participation in the community (except visiting community-weighing post) (Samarakoon & Pariduri, 2015).

Studies investigating the effect of female education on spousal violence using credible instruments are rare. There is only one unpublished paper by Erten and Keskin (2016) dealing with the endogeneity of schooling for females. They use the same education reform in Turkey with an older version of the same survey employed in the present paper and a Regression Discontinuity (RD) Design. They find that female education has no impact on marriage decision, payment of bride money, incidence of spousal violence and controlling behaviour of their partner. Most of the previous literature has investigated this issue without addressing the endogeneity bias and finds that women with higher education who live in more conservative societies are more likely to encounter domestic violence compared to similar women living in less conservative environments (Abuya et al., 2012; Karamagi et al., 2006). It therefore seems that female education is not correlated with spousal violence, rather, the role of the environment is crucial.

There are a few previous studies that examine the effects of male education on spousal violence against women without addressing the endogeneity issue. A systematic review of the previous studies in middle and low-income countries reveals that if the partner has at least secondary education, the risk of physical and sexual violence against women from their partners drops significantly (Vyas & Watts, 2009). There is no previous literature on husband's education and controlling behaviour against his spouse or other socially unacceptable behaviour of men.

These types of behaviours can strengthen the risk of violence against women (Jewkes, Levin, & Penn-Kekana, 2002).

2.2 Effects of Other Determinants

According to the "cycle of violence" hypothesis, personal history of childhood abuse increases the likelihood of experiencing or engaging in violence in later years. Especially, experience of violence during childhood is an important determinant of spousal abuse later in life (Abrahams & Jewkes, 2005; Flake, 2005; Jewkes et al., 2002; Martin et al., 2002; Naved & Persson, 2005; Rivera-Rivera et al., 2003; Yüksel-Kaptanoğlu, Türkyılmaz, & Heise, 2012).

There is a correlation between power dynamics among couples and the difference in educational attainment and ages of married couples. In the context of Nepal, Adhikari and Tamang (2010) find the age difference between husband and wife to be a significant factor of violence against the wife. On the other hand, the findings are inconclusive about the effect of education gap between couples on violence against women. When women have more education than their partner, they are more likely to experience spousal violence in India (Ackerson, Kawachi, Barbeau, & Subramanian, 2008), whereas Hindin, Kishor, and Ansara (2008) report no significant association for Bangladesh.

It has been also found that violence rises when women are isolated from their biological family and close friends (Ellsberg et al., 1999; Heise, 1998). Those who can obtain support from their family members are less likely to face spousal violence (Clark et al, 2010; Naved & Persson, 2005). Moreover, in India, Egypt and Peru, women who come from the higher end of the wealth spectrum are more protected compared to women living in lower economic conditions (Kishor and Johnson, 2004).

There is an ambiguous relationship between violence and the employment status of women. Rao (1997), for example, suggest that the personal income of a woman has a noticeable

negative influence on physical violence from her partner. Nevertheless, Krishnan et al. (2010) find that low-income women in Bangalore who were employed are more likely to experience domestic violence than women who were unemployed. Additionally, property ownership may offer women a choice outside of marriage as well as a security against labour market shocks. Panda and Agarwal (2005), in Indian context, use regression control strategies and find that if a woman's' ownership of land increases, the authority of women to make important decisions rises, and violence against women decreases. The behaviours of men might also be different towards their spouse because of differences in cultural values between urban and rural areas. For instance, in the Middle East, women who live in rural areas are at higher risk of violence than those in urban places (Boy & Kulczycki, 2008).

3. Institutional Background

Domestic violence against women is rather common in Turkey, with the likelihood that a woman will experience spousal violence closely related to her husband's level of education: 59.5 percent of women whose husbands have no or incomplete primary education experience domestic violence, compared to 47.1 percent of women whose husbands have completed secondary or higher education (Table 1).

Public education has been provided free of charge in Turkey since the foundation of the republic in October 1923. Until August 1997, compulsory education was 5 years. The compulsory education reform (CER) increased this to 8 years. By doing so, primary school (grade 1-5) and lower secondary school (grade 6-8) were combined. The CER has had little effect on the quality of education: Dulger (2004) concludes that the 1968 national education curriculum has been kept with minor alteration because of the time constraint during the implementation of the reform. Instead, the Ministry of National Education of Turkey (MONE)

was mainly concerned with the capacity of educational institutions. The government constructed new schools, employed new teachers and renovated old schools: 81,500 new primary-school classrooms were built during 1997-2002, which amounts to around 30% capacity increase (World Bank, 2005). After the reform, the gross primary school enrolment rate (grade 1-8) increased sharply (Figure 1).

The amendment in the education law went into effect in September 1997, immediately after the approval of the law. According to Turkey`s primary education law, school enrolment is determined according to calendar years. Therefore, children born in 1987, who started the 5th grade in September 1997 or later were exposed to the schooling reform and had to complete 8 years of compulsory education, whereas older individuals were not bound by the reform. However, those who were born in the last quarter of 1986 might be still affected by the reform as the implementation of age threshold was not strict. Because of this reason, we check the sensitivity of the results by dropping the 1986 birth cohort.

4. Data

The first nationally representative survey on domestic abuse against women, entitled the National Survey on Domestic Violence against Women (NSDVW), was carried out in 2008. The second wave of this cross section study was conducted in 2014 to measure the trends in the prevalence of violence against women. Our paper draws on the second wave of this survey.

The World Health Organization's ethical and safety guidelines were used in every phase of the research to ensure the safety of the interviewers and the interviewed women.[4] For example, instead of the word violence in the title of the survey, "Turkey Women and Family Survey" was used during the fieldwork. 8,960 women aged 15-59 were chosen for the face to face

[4] World Health Organization Department of Gender and Women's Health. (2001). *Putting Women First: Ethical and Safety Recommendations for Research on Domestic Violence against Women*. WHO/FCH/GWH/01.1. Geneva: WHO publications.

interview by means of the Kish method.[5] All interviews started after taking the consent of the respondent. The survey was conducted with 7,642 suitable women. Several survey questions identify acts of physical, sexual, emotional and economic violence women could experience from their spouses. These are the same questions used by WHO (see Garcia-Moreno et al., 2006). Women also answered questions about their educational and family background characteristics, marriages and how their marriages were formed. In addition, the survey includes a set of questions regarding the behaviour of their spouses towards them.

Women who have ever had at least one partner answered a question related to whether a specific type of violence has ever been inflicted on them by their partners. If the answer was affirmative, further questions addressed the frequency of the abuse . We combine these two questions into a single variable ranging from 0 (no experience of violence) to 8 (suffering frequent abuse).

a) Physical Violence index: Six variables are used: husband or intimate partner (i) slapped, or threw something that could cause injury at wife, (ii) pulled her hair, (iii) punched or hit her with things that could hurt her, (iv) kicked, dragged or beat her up, (v) burned or choked her, and (vi) threatened her with a gun, knife or any other weapons or actually used it. To form the index, these variables are added up and divided by the maximum possible value (48). The normalised index then always ranges between zero (no experience of violence) to one (the highest frequent experience of aggregated physical violence). The same procedure is used to construct the other indexes.

b) Sexual Violence index: 3 variables were used, reflecting whether the woman: (i) was ever forced to have sexual intercourse; (ii) had sexual intercourse because of the fear of her husband;

[5] If there are more than one eligible women in the households for the interview, the Kish method enables an unbiased random selection of one woman (Kish, 1949).

(iii) was forced to participate involuntarily in a sexual act with her husband/intimate partner that she finds humiliating and degrading. Again, the range is between zero and one.

c) Economic Violence index: A set of 3 variables were used capturing whether the husband: (i) prevented the woman from working or made her quit her job, (i) refused to give her money for household expenditures even though he had money, and (iii) took her income without her permission. The index again ranges from zero to one.

d) Emotional violence index: The emotional-violence-related variables measure whether the husband: (i) insulted, (ii) humiliated, (iii) scared, or (iv) threatened to hurt the woman. The index again ranges from zero to one.

f) Lifetime violence index: This index collects all 16 violence related variables into a single overall index showing the frequency of all types of violence experienced by the woman from her spouse during her lifetime. Again, the index ranges from zero to one.

Controlling behaviour index: A set of 9 binary variables, which take the value of one if the woman reports that she experienced a particular controlling behaviour from her husband and zero otherwise, are used to construct the index. These are: her husband (i) is trying to keep her away from her friends, (ii) is trying to restrict her contact with her birth family or close relatives, (iii) always insist on knowing where she is, (iv) overlooks and shows little interest in her, (v) gets annoyed when she speaks with other men, (vi) is frequently suspicious that she is unfaithful, (vii) expects her to seek his permission to go to health care service providers, (viii) requires her to dress as he asks, and (ix) interferes with her use of social media, such as Twitter or Facebook. To build the index, variables are added up. The resulting value is divided by the maximum frequency, 9. Hence, the index ranges from zero to one.

Socially unacceptable behaviour index: A set of 5 binary variables, which take the value of one if the woman reports a particular type of behaviour by her husband, is used to build the

socially unacceptable behaviour index. These variables are whether her husband: (i) often drinks alcohol, (ii) frequently gambles, (iii) uses drugs, (iv) argues with other men including engaging in physical violence, (v) cheats on her. Again, these are added up and normalised so that the index ranges from 0 to 1.

Unwanted marriage: A dummy variable which equals to one if the woman did not want the marriage and zero otherwise.

Blood relationship with husband: A dummy variable which equals to one if the woman has a blood relationship with the husband and zero otherwise.

Bride money paid: A dummy variable which equals to one if the husband`s family paid bride money to her family and zero otherwise.

Table 2 presents the summary statistics for the outcome and selected explanatory variables (the independent variables are described in detail in the Appendix).

5. Empirical Framework

The link between education and its non-market returns is captured by Equation (1) below, where Y stands for the non-market outcome of interest. This can be domestic violence and abuse, socially intolerable behaviour, man controlling behaviour, or marriage characteristics, such as whether the spouses have a blood relationship; the husband paid bride money; or the wife was forced into the marriage.

$$Y_i^{OLS} = \sigma + \theta X_i + \beta S_i + \varepsilon_i \qquad (1)$$

S_i represents the schooling of husband i measured by completing junior high school (i.e. completing 8 years of education). X_i consists of a vector of independent variables. Equation (1) also controls for dummies for the region of residence for 26 regions of Turkey and for living

in a rural neighbourhood.Robust standard errors are clustered at the 26 regions of residence of the country in all regressions.

However, the results can be biased by reverse causality between education and outcome variables or measurement error, yielding biased coefficients. To deal with this, we exploit the three-year exogenous variation in schooling attainment across cohorts induced by the timing of the Compulsory Education Reform as an instrument for education. A valid instrument should have no direct effects on the outcome of the interest other than its impact through education. Our instrument satisfies this condition. First, the CER was motivated by political events in 1997, so that it has no connection with the outcomes considered in this study. Specifically, the main purpose of the reform was to prevent the spread of religious education, and the law was enacted by the secular government, which came to the office just before the introduction of the education reform. Second, factors causing endogeneity of the schooling and reverse causality problems, such as ability bias and other background characteristics, are unlikely to be related to the birth year. For all these reasons, we are confident that the reform satisfies above-mentioned validity condition.

The first stage of the 2SLS estimation is given by equation 2:

$$\widehat{S_i} = \gamma + \rho X_i + \sigma T_i + \mu_i \quad (2)$$

where $\widehat{S_i}$ is the predicted value of schooling of men measured, alternatively, by the number of years of education and by completing junior high school (i.e. completing 8 years of education)[6]; X_i is the set of control variables defined above; T is a dummy variable equal to one for men

[6] Angrist (1991) and Angrist (2001) recommend using the Two Stage Least Square (2SLS) rather than IV-Probit or Logit when the instrument and dependent variables are dummies as in the case of this study (see also Cesur et al., 2014; Clark & Royer, 2013; Jürges, Reinhold, & Salm, 2011; Siles, 2009; Xie & Mo, 2014).

born in or after 1987, and zero for those who were born before 1986. Hence, men aged 23-27 in 2014 constitute the treated group, and older men aged 28-33 form the control group.

It is conventional in the literature to estimate the Linear Probability Model of Equation (1) without controls to test the validity of the treatment and control groups. To do this, the T dummy is replaced by dummies representing each age of the respondents (in years) at the time of the survey. Figure 2 plots the coefficients of these age dummies.[7] These are jointly significant for ages 23-27, and insignificant for men aged 28 to 32 (the p-values are 0.018 and 0.996, respectively).[8]

If the education reform has no direct impact on the outcomes other than its effect on schooling, the results of Equation (2) can be used as the first stage of the 2SLS estimation. More specifically, T serves as an instrument for schooling.

Therefore, unbiased effect of education can be obtained by estimating Equation 3:

$$Y_i^{2SLS} = \varphi + \delta X_i + \gamma \widehat{S_\iota} + \varepsilon_i \qquad (3)$$

where $\widehat{S_\iota}$ indicates the predicted value of schooling, as given by Equation (2), and Y_i^{2SLS} shows the outcome of interest. The remaining explanatory variables and clustering of robust standard errors are the same as in Equation (2).

Finally, both the OLS and 2SLS methodologies give structural estimates. By replacing $\widehat{S_\iota}$ in Equation (2) with the outcome of interests, we can obtain the reduced form (RF) estimates:

$$Y_i^{rf} = \beta + \mu X_i + \varphi T_i + e_i \quad (4)$$

[7] Unreported results of this unrestricted model are available upon request.
[8] Men aged 33 years is the omitted age dummy.

where φ indicates the RF effect of the compulsory education reform. The RF estimates measure the change in the outcome of interest induced by the exposure to the CER.

6. Regression Results and Discussion

6.1 First Stage Results of the 2SLS Estimation

Table 3 shows the effect of CER on various measures of educational attainment, which serve as the first stage of the 2SLS estimates. The F statistics, testing the validity of the excluded instrument, is very high for completing 8 years of education (JHS) while it is relatively low for the years of education. It is insignificant for completing senior high school (SHS) and obtaining a university degree (UEDC). This is not surprising, as the CER had no direct effect on these higher stages of education. These results are important since if the value of F statistics is less than 10, the weak instrument problem arises (Staiger & Stock, 1997). For this reason, completing 8 years of education variable will be considered as the sole measure of schooling in this study.

The reform has had a considerable effect on the probability of completing 8 years of schooling for individuals aged 23 to 27. More specifically, the results of column 2 in Table 3 suggest that the probability of completing at least 8 years of compulsory education increases by 18 percentage points, which corresponds to a 28.5 percent jump in the share of those completing 8 years of education, which was 63 percent before the reform. Moreover, these results do not change significantly when we exclude the individuals born in 1986 (these results are available upon request).

6.2 Second Stage Results

6.2.1 Effect of Education on Violence

Before presenting the OLS and 2SLS estimates on the effects of spouse`s schooling on spousal violence against women, we explore the effect of the CER on engaging in violent behaviour against one`s spouse, that is, the RF estimates (second row of Table 4). The coefficients of the instrument in RF regressions are significant for general, economic, emotional and physical violence but not for sexual violence. However, the magnitudes of the coefficients are quite small. Overall, considering the sizeable impact of the reform on the schooling of husbands given by Table 3, the RF estimates suggest that the effect of education on domestic violence is significant but small.

First and third rows of Table 4 display the OLS and 2SLS results for the returns to schooling, respectively. The OLS estimates of the return to completing 8 years of education are not statistically significant and the coefficients are close to zero for all measures of violence considered. The significance and magnitude of the 2SLS coefficients of return to an exogenous increase in schooling vary by the type of violence considered. The first column shows that completing junior high school lowers the incidence of overall spousal violence against women by 12.4 percentage points. Considering the sub-components, the negative effect is driven by economic, emotional and physical violence. In particular, husband`s education reduces the frequency of economic violence by 9.3, emotional violence by 19.1 and physical violence by 10.3 percentage points. In contrast, the impact of education on sexual violence is not significant. These findings are robust excluding the individuals born in 1986 (these results are available upon request).

The fact that males born post 1987 are less likely to be violent than those born prior to 1987 can be attributed to other changes, which are linked to the incidence of domestic violence

against women, happened post compulsory education reform. The data of this paper is a cross section and this would not allow separating out the impacts of these changes from the effects of the education reform through its effect on male`s education. To deal with this problem, three falsification tests are run. The expectation would be that the falsification tests would produce an insignificant link between education and the incidence of domestic violence. If it is not, the drops in the incidence of violence may be attributable to alternative factors, i.e. social trend. In each test, individuals are selected from participants who are one year older than the previous group. Specifically, three falsification tests are done for individuals aged 30-37 (people aged from 30 to 33 belong to the treatment group), 31-38 (people aged between 31 and 34 are in the treatment group), and 32-39 (people aged 32-35 are in the treatment group) separately. It is important to note that people in these particular samples are not exposed to the education reform and older individuals in each sample constitute control groups. To get the estimates, we use the IV models reported in the third row of Table 4. The findings of all falsification tests show an insignificant link between husbands` education and the incidence of spousal violence against women.[9] This suggests that presence of government policies aiming to combat violence against women and other changes in social norms can influence estimates, but falsification tests indicate that their effects are not significant.

6.2.2. Education Effect on Marriage Characteristics

Columns 1 to 3 of Table 5 present the effects of husbands' education on marriage characteristics[10]. The RF estimates are reported in the second row of Table 5. The estimates indicate that the reform caused a statistically significant drop in the share of women who had an unwanted marriage. However, the instrument has no significant impact on the incidence of paying bride money to the wife`s family and having a blood relationship with the husband.

[9]Also, the first stage F-statistics are between 6 and 8 for falsification tests. Results are available upon request.
[10] The findings are robust dropping people born in 1986 (unreported estimates are available upon request).

Similarly, the 2SLS estimates suggest that completing 8 years of formal schooling by the husband leads to a 60.7%-point reduction in the prevalence of having an unwanted marriage, whereas the effect on the other characteristics is insignificant. The OLS results also point to a negative effect on unwanted marriage, although the magnitude is substantially smaller, and also to negative effects on the probability of a blood relation between the spouses and on paying the bride price.

6.2.3. Education Effect on Controlling and Socially Unacceptable Behaviours

Columns 4 and 5 of Table 5 present the effects of education on the frequency of engaging in controlling behaviour against the wife and socially unacceptable behaviour of men. The OLS estimates in row 1 shows no statistically significant correlation between the husband`s education and these outcomes. However, the 2SLS estimates in row 3 indicate that completing 8 years of schooling does not improve the incidence of controlling behaviour, whereas it decreases the intensity of socially unacceptable behaviour by 7.8 percentage points. The RF estimates show that the reform has generated a reduction by 1.4 percentage points in the frequency of the socially unacceptable behaviour. However, the 2SLS and RF coefficients of this index are only statistically significant at the 10-percent level. Hence, it appears that the reform has had a negligible impact on controlling behaviour and socially unacceptable behaviour and the results are robust removing individuals born in 1986 from the data[11].

6.3 Effects of Other Explanatory Variables

Next, we examine the other determinants that can affect spousal violence against women, marriage characteristics or controlling and socially unacceptable behaviour of men. Table 6

[11] Unreported estimates are available upon request.

shows the impacts of the other factors. These correspond to the 2SLS regressions reported as the third row of Tables 4 and 5.

Personal abuse history of both spouses clearly plays an important role for the outcomes examined: The intensity of most violence types and the frequency of controlling behaviour are positively correlated with history of abuse experienced by the husband's or wife's mothers or by the husband himself. Hence, domestic violence, on either the husband's or wife's side, can have significant repercussions also in future generations.

The effects of the ethnicity of husband, a proxy for his cultural environment, indicates that Kurdish men are more likely to pay bride money than Turkish men, but the incidence of socially unacceptable behaviours, emotional and physical violence is lower for Kurdish compared to Turkish husbands.

Differences between the two spouses in education or age have a bearing for several marriage characteristics: women who are older or more educated than their husbands are more likely to find themselves in an unwanted marriage (a similar effect is also observed when the husband is more educated rather than both spouses having approximately the same education); a wife older than her husband is also more likely to be subjected to controlling behaviour, while her husband is less likely to have paid a bride price for her. When the husband is older by 2-4 years, the wife is more likely to experience violence, especially of the emotional kind (while the incidence of paying bride money falls); the husband being older by 5+ years increases the probability that the wife did not agree to the marriage. Finally, when the two spouses are of different ethnicity, the incidence of unwanted marriage and of paying bride money both fall.

A crucial determinant of the dependent variables explored in this study is "counting on family members for support". A woman who does not think her birth family would support her in an emergency experiences more physical violence. The husband of such a woman is also more

likely to pay a bride price, but she is less likely to have an unwanted marriage. If the woman`s birth family lives far from her, there is a higher likelihood of having a blood relationship with the husband. Moreover, if the woman lives in rural area, she is more likely to have an unwanted marriage, but the incidences of economic violence and socially unacceptable behaviours of men both fall.

Economic endowments and labor-market status of the two spouses are important as well. Higher family wealth index increases the probability of blood relationship with husband whereas having her own assets is decreases the intensity of physical violence. Finally, the intensity of socially unacceptable behaviour increases when the wife works and when the husband is unemployed.

6.4 Sensitivity Tests: Restricted Schooling Attainment Outcomes

The 2SLS estimates show the impact of education on compliers (LATE) only. As shown before, the education reform has no impact on graduating from senior high school (SHS) or university. If the reform does not have any spillover effects on completion of university and senior high school degrees, removing SHS and university graduates from the sample does not alter the composition of compliers. However, some members of the control group hold SHS and university degrees, and to some extent, their observed control variables should be dissimilar from others in the sample. Because of this, excluding them from the sample might have a significant impact on the estimated coefficients (e.g. Aydemir & Kirdar, 2015). To explore this in detail, in this section, we impose different restrictions on the highest educational attainment in the sample. Firstly, we remove the university graduates. Row B of Table 7 shows the results of the 2SLS estimates for people who hold at most a SHS degree.[12] It is apparent

[12] Model specifications of the third row of Tables 4 and 4 are used to the estimates reported in Table 7.

from the table that the results are robust to this.[13] Next, we exclude also SHS graduates. Now, the sub-sample includes only compliers, many of whom would complete only 5 years of schooling in the absence of the reform but were required to complete 8 years of compulsory schooling after the CER was implemented. As shown by Row C of Table 7, the education effect falls but remains significant after excluding senior high school graduates across the board: for general, economic, emotional, and physical violence, for unwanted marriage, and for socially unaccepted behaviour. Moreover, the OLS coefficients are still much lower than the 2SLS estimates, and including or excluding the birth cohort of 1986 does not change the estimates significantly.[14] The results with restricted education attainment are not surprising. One of the explanations for the drops in magnitude of the education coefficient could be that the causal link between education and its non-market returns exists but it does not appear on the low schooling margin. For instance, Cutler and Lleras-Muney (2010) find a more pronounced relationship between education and health when individuals are on the high schooling margin. Moreover, Aydemir and Kirdar (2015) also use the same schooling reform with a different data set to estimate wage effects of schooling and finds similar estimates with narrowed composition of education distribution.

6.5 Sensitivity Tests: Narrower Birth Year Window

We further test the sensitivity of the baseline results by employing a narrower window of birth years around the treatment year: individuals aged 24 to 31. The individuals aged 24 to 27 form the treatment group, whereas older individuals belong to the control group. By doing this, the two groups became more similar in terms of age; the downside is a much smaller sample size. As shown by Row D of Table 7, after narrowing the window around the treatment, the 2SLS

[13] In this restricted sample, the effects of the reform on completing 8 years of education, JHS, was also quite similar to the baseline estimates.
[14] The OLS results are available upon request.

estimates and their standard errors get larger for all outcome measures as expected so that the estimates become statistically insignificant for economic violence and socially unacceptable behaviour of men. Cesur et al. (2014) exploited the same education reform with a different data set to estimate health effects of education and reaches a similar conclusion with narrower age sample.

7. Conclusion

This paper constitutes, to the best of our knowledge, the first empirical investigation of the relationship between the husbands' education and violent and abusive behaviour against women, estimated in a way that is robust to endogeneity of education. Specifically, we take advantage of a natural experiment, a compulsory education reform in Turkey, which increased the legally mandated length of schooling from five to eight years. The results of our analysis suggest that increasing male education reduces the incidence of domestic violence for most types of abusive behaviour: physical, emotional, and economic, the only exception being sexual violence. Higher education also reduces the frequency of marriages concluded against the woman's wishes and makes men less prone to engage in socially unacceptable behaviour (drinking, gambling, drug abuse and the like), albeit this effect is somewhat less precisely estimated.

Education has important private and social returns, which are well documented in previous literature. Our analysis suggests a range of additional benefits. Given the widespread incidence of domestic abuse against women in developed and developing countries alike, and the adverse effects that it has on women, the effects identified by our analysis can lead to substantial improvements in women's wellbeing. Furthermore, our results show support for the cycle of violence hypothesis: the history of maternal domestic abuse, either on husband's or wife's side,

increases the incidence of domestic violence at present. Therefore, reducing violence against women today can lead to improvements both contemporaneously and in the future.

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Figure 1. Gross enrolment rate in 8-year primary school education by Academic Year

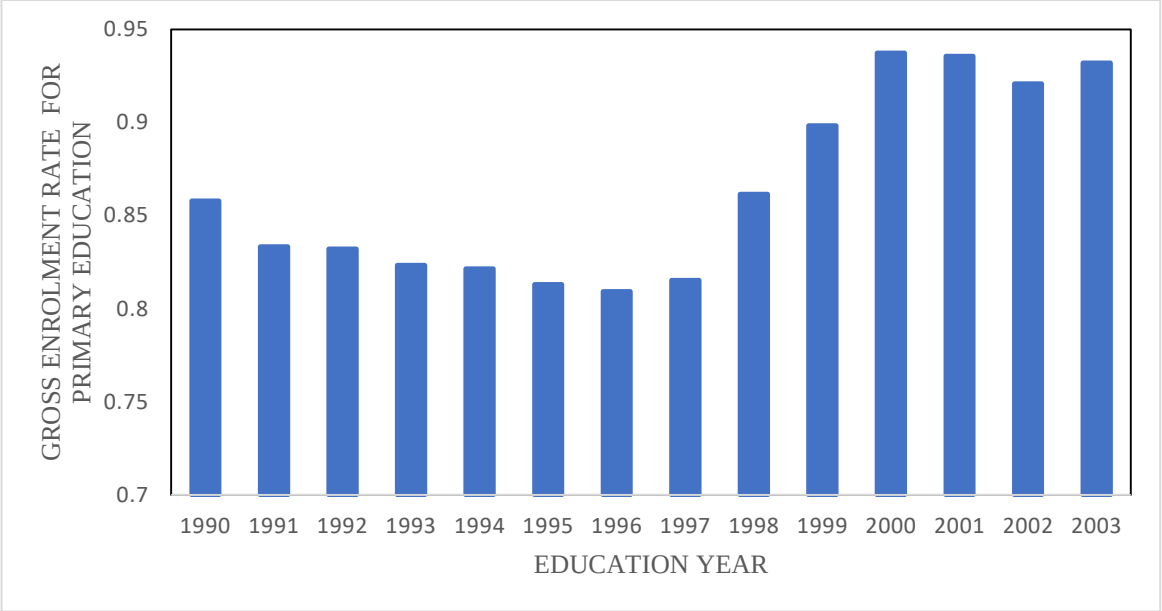

Figure 1: Gross enrolment rate in 8-year primary school education by academic year calculated as the number of students in grade 1 to 8 divided by the relevant population at that age group (i.e. aged 6-13). Enrolment rates during the 1990-97 period (prior to the CER) are calculated by adding the sum of the students in the primary school and junior high school. Own calculation based on MONE statistical data for 1990/91 to 2003/04 school years.

Figure 2. Coefficients of age dummies

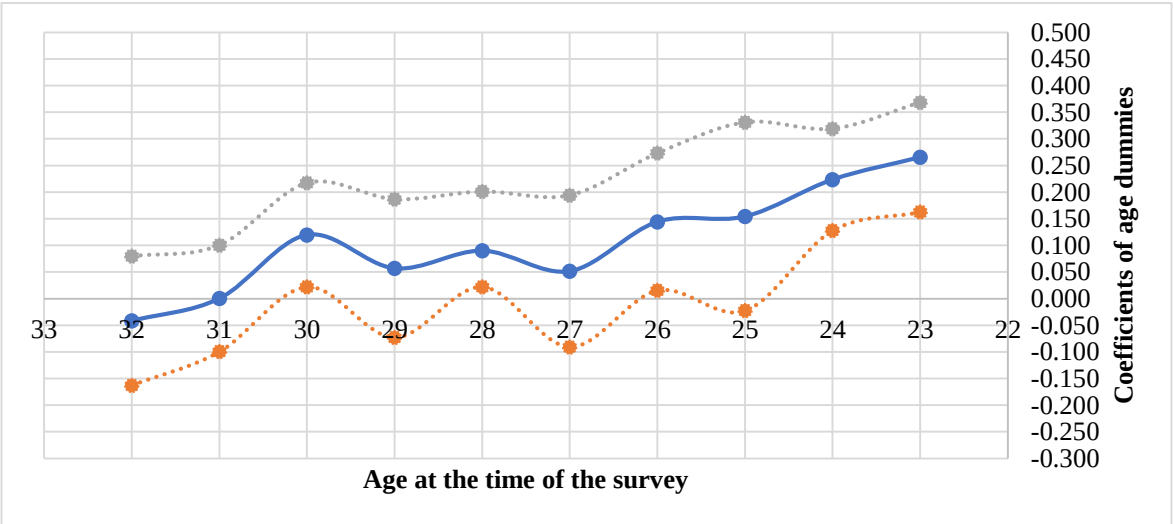

Figure 2 Coefficients of age dummies. *Notes: The sample covers all men aged of 23-33 at the time of the survey. Men aged 28 are the youngest unaffected birth cohort. Each point on the solid line shows the coefficients of each age dummies. Dashed lines show 95% confidence interval.*

Table 1. Violence against Woman by Spouse's Educational Attainment

Spouse`s Education	Violence	Economic	Emotional	Physical	Sexual
No education/Primary incomplete	0.595	0.317	0.405	0.366	0.121
8 Years Primary School complete	0.500	0.248	0.357	0.205	0.062
Secondary school or higher	0.471	0.218	0.349	0.175	0.055

Source: NRDVW 2014

Table 2. Descriptive Statistics for Dependent and Selected Independent Variables

Variables	Obs.	Mean	Std. Dev.	Min	Max
Dependent Variables					
Life time violence	1270	0.531	0.499	0	1
Life time economic violence	1291	0.270	0.444	0	1
Life time emotional violence	1294	0.373	0.484	0	1
Life time physical violence	1286	0.257	0.437	0	1
Life time sexual violence	1302	0.081	0.273	0	1
Unwanted marriage	1303	0.371	0.483	0	1
Blood relation with wife	1300	0.234	0.424	0	1
Husband paid bride money	1301	0.123	0.328	0	1
Man controlling behaviour	1292	0.835	0.371	0	1
Socially unacceptable behaviour	1299	0.208	0.406	0	1
Explanatory variables					
Completing Junior high school	1292	0.671	0.470	0	1
Years of education completed	1292	8.949	3.672	0	19
Man aged 23/27	1303	0.252	0.435	0	1
Husband`s mother experienced spouse violence	1302				
No[r]		0.520	0.500	0	1
Yes		0.252	0.434	0	1
Does not know		0.228	0.420	0	1
Husband experienced physical violence from his family during his childhood	1300				
No[r]		0.612	0.487	0	1
Yes		0.212	0.409	0	1
Does not know		0.175	0.380	0	1
Woman`s mother experienced violence from her spouse	1303				
No[r]		0.665	0.472	0	1
Yes		0.294	0.456	0	1
Does not know		0.041	0.198	0	1
Wealth index of the family	1303	0.588	0.268	0.2	1
Difference in ethnicity	1298	0.052	0.221	0	1
Educational difference	1292				
No difference in education [r]		0.318	0.466	0	1
Woman has more education		0.236	0.425	0	1
Husband has more education		0.445	0.497	0	1
Age difference	1303				
Almost the same age[r]		0.352	0.478	0	1
Women is older than man		0.088	0.284	0	1
Man is older than woman 2/4 years		0.290	0.454	0	1
Man is older than woman more than 5 years		0.270	0.444	0	1
Husband`s ethnicity	1299				
Turkish[r]		0.777	0.416	0	1
Kurdish		0.172	0.378	0	1
Other		0.051	0.219	0	1
Employed woman	1303	0.255	0.436	0	1

Unemployed husband	1303	0.061	0.240	0	1
Asset ownership of woman	1302	0.233	0.423	0	1
Woman family members live far away from her	1303	0.325	0.469	0	1
Woman counts on family support in case of a need	1301				
Yes[r]		0.814	0.389	0	1
No		0.160	0.367	0	1
Does not know		0.025	0.157	0	1
Lives in rural residence	1303	0.202	0.401	0	1

Notes: r denotes the reference category

Table 3. The Effect of CER on School Completion (First Stage Results)

VARIABLES	HGC	JHS	SHS	UEDC
Instrument	0.522**	0.176***	-0.000	-0.012
	(0.226)	(0.019)	(0.035)	(0.029)
F statistics	5.350	85.680	0.000	0.180
Observations	1,281	1,281	1,281	1,281

Notes: Robust standard errors clustered at the 26 regions of residence are reported in parenthesis. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. All regressions control for employment status of man and woman, difference in ethnicity between husband and wife, ethnicity of husband, asset ownership index, wealth index, rural residence, husband`s and wife`s maternal physical abuse history, differences in education and age, and fixed effects of 26 regions of residence.

Table 4. The Effect of Husband`s Education on Husband's Domestic Violence

	General	Economic	Emotional	Physical	Sexual
OLS	-0.013	-0.019	-0.004	-0.014	-0.016
	(0.013)	(0.013)	(0.016)	(0.010)	(0.010)
RF	-0.022***	-0.017***	-0.034***	-0.018***	0.001
	(*0.007)	(0.006)	(0.011)	(0.005)	(0.011)
IV	-0.124***	-0.093***	-0.191***	-0.103***	0.197
	(0.034)	(0.035)	(0.055)	(0.026)	(1.465)
Observations	1,250	1,271	1,272	1,264	1,280
	Unwanted marriage	Relationship with husband	Partner paid a bride price	Controlling behaviour	Socially unacceptable behaviour
OLS	-0.178***	-0.094**	-0.058*	-0.022	0
	(0.031)	(0.036)	(0.030)	(0.014)	(0.010)
RF	-0.107***	0.049	0.004	0.001	-0.014*
	(0.024)	(0.036)	(0.02)	(0.014)	(0.007)
IV	-0.607***	0.279	0.024	0.007	-0.078*
	(0.140)	(0.213)	(0.108)	(0.078)	(0.041)
Observations	1,281	1,279	1,279	1,270	1,278

Notes: Robust standard errors clustered at the 26 regions of residence are reported in parenthesis. Significance levels: *** p<0.01, ** p<0.05, * p<0.1. All regressions control for employment status of man and woman, difference in ethnicity between husband and wife, ethnicity of husband, asset ownership index, wealth index, rural residence, husband`s and wife`s maternal physical abuse history, differences in education and age, and fixed effects of 26 regions of residence.

Table 6. Effects of Other Control Variables

VARIABLES	General	Economic	Emotional	Physical	Sexual	Unwanted marriage	Relationship with husband	Husband paid a bride price	Controlling behaviour	Socially unacceptable behaviour
Husband`s mother abused	0.044***	0.048***	0.066***	0.020**	0.537**	0.044	0.097	0.011	0.047**	0.010
	(0.012)	(0.016)	(0.016)	(0.009)	(0.270)	(0.033)	(0.063)	(0.019)	(0.019)	(0.014)
Husband does not know	-0.016	-0.005	-0.019	0.020***	-0.158	-0.054	-0.053*	0.054**	0.005	-0.006
	(0.010)	(0.011)	(0.015)	(0.007)	(0.168)	(0.043)	(0.031)	(0.021)	(0.019)	(0.012)
Abused husband	0.037***	0.001	0.063***	0.034***	0.645**	-0.048*	-0.008	-0.019	0.044**	0.025
	(0.012)	(0.010)	(0.016)	(0.012)	(0.306)	(0.028)	(0.026)	(0.021)	(0.018)	(0.017)
Does not husband abused	0.019	0.003	0.039	0.016	0.014	0.010	0.003	0.023	0.033*	-0.014
	(0.014)	(0.011)	(0.024)	(0.010)	(0.181)	(0.066)	(0.044)	(0.028)	(0.018)	(0.013)
Abused mother	0.039***	0.021**	0.046***	0.036***	0.346	0.043	0.008	0.003	0.048***	0.016*
	(0.009)	(0.009)	(0.015)	(0.007)	(0.234)	(0.040)	(0.035)	(0.017)	(0.015)	(0.008)
Does not know mother abused	0.012	0.028	-0.000	0.018	-0.306	-0.133	-0.079	-0.045	0.037	0.055***
	(0.016)	(0.019)	(0.028)	(0.013)	(0.311)	(0.095)	(0.055)	(0.038)	(0.027)	(0.021)
Woman has more education	0.006	-0.002	0.007	0.001	0.086	0.120***	-0.057	0.008	0.015	0.007
	(0.012)	(0.011)	(0.020)	(0.011)	(0.239)	(0.034)	(0.041)	(0.022)	(0.023)	(0.015)
Man has more education	0.029**	0.029**	0.047**	0.018*	-0.097	0.205***	-0.066	0.004	0.017	0.004
	(0.013)	(0.012)	(0.022)	(0.010)	(0.370)	(0.056)	(0.061)	(0.035)	(0.027)	(0.014)
Woman is older than man	-0.019*	-0.025**	-0.022	-0.008	-0.289*	0.144**	0.055	-0.054**	0.057***	-0.023
	(0.011)	(0.012)	(0.019)	(0.011)	(0.173)	(0.070)	(0.043)	(0.024)	(0.018)	(0.014)
Man is older than woman 2/4 years	0.026***	0.012	0.052***	0.012	0.153	0.018	-0.011	-0.049**	0.001	0.005
	(0.009)	(0.013)	(0.011)	(0.008)	(0.360)	(0.036)	(0.038)	(0.021)	(0.016)	(0.012)
Man is older than woman more than 5 years	-0.006	-0.013	0.002	-0.006	-0.111	0.060*	-0.072	0.008	0.009	-0.006
	(0.007)	(0.008)	(0.012)	(0.005)	(0.186)	(0.035)	(0.047)	(0.018)	(0.019)	(0.013)
Husband`s ethnicity Kurdish	-0.033	-0.025	-0.053**	-0.035**	0.319	-0.072	0.183	0.220***	0.001	-0.025*
	(0.020)	(0.017)	(0.024)	(0.017)	(0.530)	(0.051)	(0.112)	(0.033)	(0.025)	(0.014)
Husband`s ethnicity others	0.066***	-0.038**	0.104***	0.043***	1.086***	0.023	0.153	0.413***	-0.058**	0.049***

	(0.016)	(0.018)	(0.027)	(0.016)	(0.384)	(0.076)	(0.122)	(0.070)	(0.024)	(0.011)
Woman`s birth family does not support woman in case of a need	0.015	0.008	0.002	0.018*	0.418	-0.061*	0.014	0.118***	0.026	0.005
	(0.012)	(0.015)	(0.020)	(0.010)	(0.340)	(0.037)	(0.054)	(0.033)	(0.021)	(0.015)
Woman is not sure about her birth family`s supports in case of a need	-0.001	-0.013	-0.014	0.019	1.110	0.076	-0.028	0.079	0.068	0.031
	(0.024)	(0.019)	(0.033)	(0.024)	(0.912)	(0.106)	(0.062)	(0.054)	(0.046)	(0.027)
Wealth index	0.008	0.001	0.028	0.013	-0.775	0.087	0.444***	-0.049	-0.076	0.035
	(0.028)	(0.027)	(0.046)	(0.023)	(0.742)	(0.098)	(0.116)	(0.107)	(0.057)	(0.029)
Difference in ethnicity	0.015	0.017	0.020	0.005	0.417	-0.104*	-0.078	0.122***	0.028	0.033
	(0.023)	(0.022)	(0.032)	(0.017)	(0.432)	(0.060)	(0.079)	(0.039)	(0.035)	(0.022)
Employed women	0.006	-0.002	0.013	0.005	-0.119	-0.009	-0.023	-0.014	-0.003	0.041***
	(0.008)	(0.008)	(0.012)	(0.008)	(0.242)	(0.023)	(0.046)	(0.026)	(0.014)	(0.012)
Unemployed husband	0.001	0.019	-0.007	-0.001	-0.224	-0.020	-0.011	-0.018	0.005	0.071***
	(0.013)	(0.021)	(0.020)	(0.011)	(0.241)	(0.084)	(0.061)	(0.049)	(0.024)	(0.026)
Asset ownership index	-0.028	-0.003	-0.043	-0.031**	-0.404	-0.095	-0.099	-0.054	-0.062	0.047
	(0.018)	(0.018)	(0.028)	(0.013)	(0.407)	(0.085)	(0.081)	(0.040)	(0.040)	(0.029)
Family lives far	0.002	-0.003	0.018	0.001	0.101	0.043	0.027	0.035**	-0.008	0.005
	(0.007)	(0.005)	(0.012)	(0.007)	(0.193)	(0.070)	(0.019)	(0.016)	(0.017)	(0.008)
Rural	-0.007	-0.014*	-0.014	-0.002	0.174	0.082**	0.005	0.082	0.018	-0.024**
	(0.008)	(0.008)	(0.009)	(0.009)	(0.216)	(0.034)	(0.051)	(0.056)	(0.013)	(0.010)
Observations	1,250	1,271	1,272	1,264	1,280	1,281	1,279	1,279	1,270	1,278

Notes: This table reports the coefficients explanatory variables of the 2SLS model specifications reported in the third row of Tables 4.4 and 4.5. Significance: *** p<0.01, ** p<0.05, * p<0.1 . Robust standard errors adjusted for clustering at the 26 regions of residence are reported in parenthesis. All models control for fixed effects of 26 regions of residence and include the instrumented schooling variable.

Table 7. Effects of the 2SLS Estimates by Imposing Various Restrictions

	General	Economic	Emotional	Physical	Sexual	Unwanted marriage	Relationship with husband	Husband paid a bride price	Controlling behaviour	Socially unacceptable behaviour
A. 2SLS full sample	-0.121***	-0.093***	-0.191***	-0.103***	0.197	-0.607***	0.279	0.024	0.007	-0.078*
	(0.034)	(0.035)	(0.055)	(0.026)	(1.465)	(0.140)	(0.213)	(0.108)	(0.078)	(0.041)
Observations	1,250	1,271	1,272	1,264	1,280	1,281	1,279	1,279	1,270	1,278
B. Less than University Education	-0.121***	-0.091***	-0.175***	-0.102***	0.076	-0.615***	0.250	0.058	0.035	-0.078**
	(0.034)	(0.033)	(0.054)	(0.025)	(1.468)	(0.138)	(0.165)	(0.106)	(0.074)	(0.038)
Observations	1,128	1,148	1,147	1,140	1,155	1,156	1,154	1,154	1,145	1,153
C. Less than SHS education	-0.094***	-0.071**	-0.161***	-0.074***	0.653	-0.465***	0.166	0.037	0.004	-0.05
	(0.034)	(0.031)	(0.047)	(0.024)	(1.535)	(0.157)	(0.132)	(0.087)	(0.062)	(0.037)
Observations	703	716	718	713	721	722	720	720	713	720
D. 4 years Date of Birth Window	-0.164***	-0.106	-0.252***	-0.139***	-0.420	-0.753***	0.530	0.100	-0.015	-0.094
	(0.059)	(0.068)	(0.094)	(0.046)	(2.413)	(0.264)	(0.373)	(0.157)	(0.096)	(0.074)
Observations	834	848	850	847	856	857	856	855	848	856

Notes: Robust standard errors clustered at the 26 region of residence are reported in parenthesis. Besides, I report the F statistics on the excluded instrument. *** p<0.01, ** p<0.05, * p<0.1 shows the significance of the coefficients at 1, 5 and 10 percent level respectively. All regressions control for working status of man and woman, difference in ethnicity husband and wife, ethnicity of husband, asset ownership index, wealth index, rural residence, husband`s and wife`s maternal physical abuse status, husband`s physical abuse status from their family, fixed effects of 26 regions of residence. In addition, the fixed effects of difference in education and age variables as well as whether woman has support from her family in case of emergency are controlled for.

Appendix (not for publication): Independent Variables

Asset ownership index of woman: Each variable equals one if the woman owns the assets either by herself or jointly with someone else, and zero otherwise. Ownership of land, house, company, vehicle and savings in a bank are included as assets. These are added up and normalised so that the index ranges from zero to one.

Wealth index: This index was calculated by considering the ownership of various assets by the households and specific features of the house to obtain a measurement of the socio-economic status of the households. The method has been previously applied by Filmer and Pritchett (2001). The wealth index ranges from 1 (poorest) to 5 (richest), or from 0.2 to 1 after normalisation, with the richest households taking the value of one.

HGC: Years of formal schooling completed by respondent`s husband

JHS: A dummy variable equals to one if the respondent`s husband completed 8 years or more formal education (junior high school), and zero otherwise.

HSE: A dummy variable equals to one if the respondent`s husband completed 11 years or more formal education, and zero otherwise.

UEDC: A dummy variable equal to one if the respondent`s husband completed 15 years or more formal education, and zero otherwise.

*Husband`s mother experience of domestic violence: Three* dummy variables were generated: (1) the husband`s mother was not abused by her partner, (2) she was abused, (3) the respondent does not know whether her mother in law has experienced violence or not.

*The respondent`s mother experience of domestic violence:* Three dummy variables were generated: (1) the respondent`s mother was not abused by her partner, (2) she was abused, (3) the respondent does not know whether her mother has experienced violence or not.

Husband`s experience of violence: Three dummy variables were generated: (1) her husband was not abused by family members, (2) he was abused, (3) the respondent does not know whether he has experienced violence or not.

Regional dummies: Dichotomous variables for each of the 26 regions where the respondent and her husband live.

Rural: A dichotomous variable was defined as one if the respondent lives in the rural location.

The ethnicity of husband: Three dummy variables were generated, one for each of the following ethnicity types. Turkish, Kurdish, and others.

The difference in ethnicity: A dummy variable equals to one if the husband and respondent have a different ethnicity, and zero otherwise.

The difference in education: Three dummy variables were generated for each of the following categories: (1) husband has more education than his wife, (2) no difference in education, and (3) woman has more education than her husband

The difference in age: Four dummy variables generated for each of the categories: (1) approximately the same age, i.e. maximum one-year age difference. (2) woman is older than her husband. (3) the man is older than his wife by 2 to 4 years. (4) husband is older than his wife by more than 5 years.

Employed woman: A dummy variable was coded as one if a woman works, zero otherwise.

Unemployed husband: A dummy variable coded as one if the husband is unemployed.

Family members of the respondent live far from her: A dichotomous variable which equals one if the respondent lives far from her family, and zero otherwise.

Woman can count on family members for support: Three dummy variables are generated for each category of the family support variable: (1) yes, (2) no, and (3) does not know.