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Domestic Violence Against Women

Its Determinants and Implications
for Gender Resource Allocation

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Abstract

Using data from a survey of Bangladeshi households, this paper explores the determinants of domestic violence against women as well as its implications for the resources allocated to women. The findings reveal that higher education of women and that of their husbands, and better socioeconomic status of households are crucial in reducing the risk of violence, while, contrary to general perceptions, women's involvement in income generating activities and participation in NGO programmes do not have any similar effects. When resources allocated to women with and without the experiences of domestic violence are compared, no statistically significant difference between the mean calories consumed by the two groups can be found. However, there is robust evidence of women subject to domestic violence receiving significantly lower calories from the preferred food items such as, fish, meat, eggs, drinks and dairy products. Furthermore, this group of women is allocated significantly lower amounts of household food and non-food expenses compared to their counterparts who do not report domestic violence against them.

Keywords: domestic violence, intra-household distribution, Bangladesh

JEL classification: D13, D63, J12, O53

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1   Introduction

Domestic violence (DV) is perhaps the most important element of the set of violence against women because of its far-reaching implications on their health, physical as well as psychological, and on overall relative gender status.[1] It is not only a matter of human rights but also a concern of public health (Heise et al. 2002; Bates et al. 2004). Attempts have been made in some countries to estimate the economic and social costs that domestic violence entails. For example, while Ribero and Sanchez's (2005) estimate of such indirect costs amount to at least 4.2 per cent of GDP in Colombia, for Chile and Nicaragua, the comparable figures are shown to be about 2 per cent each (Morrison and Orlando 1999). According to the World Bank (1993), 20 per cent of healthy days of life lost to reproductive-aged women result from gender-based victimization. From the period of the Roman Empire (Dobash and Dobash 1979) to modern-day America (Straus and Gelles 1986), violence against women has always characterized the 'civilized' world.

The exploration of the issue of within household violence against women in applied economics literature is relatively new in most countries and particularly in Bangladesh. Although a number of studies on a few countries have attempted to find out the possible determinants and risk factors, the outcomes of domestic violence are largely unaddressed, with most studies focusing only on the health outcomes. Currently, it is not known whether the women who are subject to domestic violence also suffer from their lower shares in household resources. In this paper, we use a random data set on Bangladesh, generated by a specialized survey investigating various intra-household matters, and make an endeavour at contributing to the existing literature on within household violence against women with regard to two issues. First, we identify a set of potential determinants, including individual, household and marital characteristics, of domestic violence against women in Bangladeshi households. And, more importantly, we examine whether women who report domestic violence against them tend to have lower household resources allocated in their favour in comparison with those who do not report such incidents.

The organization of the paper is as follows: this introductory section (Section 1) is followed by a brief review of the literature, highlighting the evidence of domestic violence across countries (Section 2); Section 3 presents the setting of the paper and describes the data used; Section 4 provides a comparative assessment of resource allocated to women subject to domestic violence vis-à-vis women without such experiences; Section 5 explores the factors influencing domestic violence; Section 6 shows the statistical relationship between domestic violence and resource allocated to women; Section 7 concludes.

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[1] See Heise et al. (2002), Díaz-Olavarrieta et al. (2002), Gomez and Meacham (2001), Heise and Ellsberg (2001) and Koenig et al. (2003).

2 Domestic violence against women: cross-country evidence

Domestic violence against women exists in every society, ranging from low income countries to the highly developed ones. Jayaraman (2004) reports that at least one-third of all women have experienced domestic violence (by their husbands/family members) in their lifetime. According to González-Brenes (2003), in rural Tanzania, at least 25 per cent of the surveyed women are beaten by their husbands. Following Coker and Richter (1998), two-thirds of the surveyed women were beaten by their husbands/partners and half were forced to have sexual intercourse against their will in Sierra Leone. In Egypt, one-third of the women were beaten since their marriage (El-Zanaty et al. 1996), 25 per cent of the surveyed women in Uganda reported to have been abused physically (Koenig et al. 2003). The presence of such spousal violence is also noteworthy in Cambodia (16 per cent), Colombia (21 per cent), South Korea (38 per cent) and Thailand (20 per cent).[2] In various socio-economic surveys on India between 22 and 48 per cent women have reported domestic violence against them.[3] Turning to the developed countries, amongst others, 29 per cent of all married women and 50 per cent of all divorced women in Canada reported to have been subject to violent behaviour by their husbands (Statistics Canada 1993a, b). Similarly, 28 per cent of women in the USA also report experiencing physical abuse in their homes Straus and Gelles (1986). The incidence of domestic violence in Bangladesh has also been demonstrated in a number of studies. In a 1996 study Schuler et al. reported that 47 per cent of the reproductive-aged women in rural Bangladesh were physically abused. Koenig et al. (2003), while considering two rural areas in separate districts, found the rate of domestic violence around 42 per cent. In Bates et al. (2004), 66 per cent of the rural married women were physically abused (slapped/pushed/hit) regularly during their married life, whereas 33 per cent were kicked/burned/hit by sticks. What is more, according to Fauveau et al. (1988) and Ronsmans and Khlat (1999), domestic violence also contributed markedly to the maternal mortality in Bangladesh.

Domestic violence has been linked to individual, household and demographic characteristics, socioeconomic status, adverse reproductive health outcomes, contextual considerations, etc. A number of studies revealed strong negative relations between the risk of domestic violence and household wealth and husband's education (Kim and Cho 1992; Jejeebhoy and Cook 1997; Martin et al. 1999; Hoffman et al. 1994, Mahajan 1990). Higher age (Kim and Cho 1992; Schuler et al. 1996), higher number of children (Schuler et al. 1996; Rao 1997) and woman's education (Schuler et al. 1996; Jewkes et al. 2002) are also found to reduce the risk of violence.[4] Koenig et al. (2003), in a survey of women of reproductive age in rural Uganda, found male partners' alcohol consumption and their perceived HIV risk as being two important factors of domestic violence against females. Some other studies (van der Straten et al. 1998; Watts et al. 1998; Rao 1997; Jewkes et al. 2002) also recognized a strong relationship between alcohol/drug consumption and domestic violence while others (van der Straten et al.

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[2] The sources of these findings are the 1995 Demographic and Health Survey for Columbia, Nelson and Zimmerman (1996), Hoffman et al. (1994) and Kim and Cho (1992) respectively.

[3] For example, see Jejeebhoy and Cook (1997), Jejeebhoy (1998), Martin et al. (1999), Rao (1997) and IIPS and ORC Marco (2000).

[4] There is no consensus about the effect of the variables identified by different authors. For example, in contrast to many studies, Jejeebhoy and Cook (1997) found no significant role of higher age.

1998; Maman et al. 2000; Coker and Richter 1998) explored the link between HIV status and domestic violence.

In Tauchen et al.'s (1991) non-cooperative bargaining framework men 'purchase' domestic violence from women with income transfers. Their empirical findings are – the influence of income on violence depends on the couple's income level, the association of violence with age difference and male age is positive and negative respectively, and for different ethnic groups the frequency of violence does not differ. According to Tauchen et al. (1995) past records of violence and man's current employment status significantly influence the current-period violence. In the context of a non-cooperative game, Farmer and Thiefenthaler (1997) showed that a woman's threat point is altered by improvements in her outside alternatives such as, income and other financial support from outside the marriage, and hence result in a reduced degree of violence. In another study, the same authors while explaining the recent decline in domestic violence in the USA, identified increased availability of legal services for victims, women's improved economic status, and demographic trends (especially, the ageing of the population) as the crucial factors. For three rural Indian villages Bloch and Rao (2002) investigated the connection between dowries and violence in the context of a non-cooperative bargaining and signaling model. They assert that violence, which may signal a husband's dissatisfaction with the marriage, is used as a bargaining apparatus to extort higher income transfers from the wife's family. However, Jejeebhoy and Cook (1997) extend support to the view that the impact of dowry is protective.

Violence is also affected by unavailability of equal economic opportunities for both sexes; degree of legal protection offered to the victim and the availability of other required institutional resources for the victim (Pagelow 1981). Reducing economic and social independence of the victim will raise the risk of violence (Walker 1984). Following Kalmuss and Straus (1990), women depending highly on marriage experience greater abuse, and male-dominated marriage also raise the risk of violence against females (Coleman and Straus 1986; Allen and Straus 1980). On the other hand, women's higher degree of autonomy and greater control over resources are thought to act as shields against violence (Jejeebhoy and Cook 1997; Jejeebhoy 1998; Levinson 1989). However, some argue that this association may be context-specific and in a relatively conservative milieu, higher degree of female autonomy may actually raise the risk of violence (Levinson 1989; Koenig et al. 2003). Using data from Northern India Koenig et al. (2006) show that although higher socioeconomic status was instrumental in reducing physical violence, it could not prevent sexual violence. Their findings also indicate the importance of contextual factors.

Jayaraman (2004), using data from India, showed that man's preferences over domestic violence are consonant with expressive and instrumental aggression. However the data produced mixed results when three alternative models of domestic violence were tested. Bowlus and Seitz (2006), using Canadian data, reveal considerable differences between the mean characteristics of individuals of violent marriage and those of non-violent marriage. Formulating a sequential model of employment, marriage, and abuse, they suggest that abuse is the primary factor of divorce-decision. They also find evidence in favour of inter-generational transmission of domestic violence. González-Brenes (2003), in a study of rural Tanzania detected a higher degree of vulnerability during childbearing period but no association between violence and the household wealth measures. Also relationships to female relatives were found to have a negative impact on violence.

In Bangladesh, a few attempts have been made to explain domestic violence. Bates et al. (2004) using data from six rural villages in three districts, examined the role of women's education, their participation in micro-credit lending programmes, contribution to household expenses, dowry arrangements and marriage registration as the potential determinants of women's right and vulnerability in marriage. Among them only education was found to diminish the likelihood of violence significantly. Dowry agreement or personal earnings (contributing more than nominally to the marital household) were raising the likelihood of violence. Based on a cross sectional survey of reproductive aged women, Koenig et al. (1999) indicates to the crucial role played by community and individual level factors such as, women's status and autonomy. Again those impacts, as the study suggests, may vary depending on the cultural and normative conditions. In a later study Koenig et al. (2003) found that the impact of female status on violence was highly context-specific, as it depended on the degree of cultural conservativeness of the area.

3   Setting and data

3.1 Setting: Bangladesh

Marriage, which is considered to be one of the most vital events of life in Bangladeshi society, has many socioeconomic and cultural implications. While around half of the married women fall in the 15-29 year age group, the same age category contains only a quarter of the married males.[5] This indicates that women are usually married to men belonging to a higher age group. In the last two decades, although the mean age at marriage for male has remained more or less unchanged, that for female has risen over time. The mean age at marriage is higher for urban residents compared to their rural counterparts. Marriage contracts and outcomes may differ across religions. However in Bangladesh about 90 per cent of the population are Muslims while the remaining are Hindus, Buddhists, Christians and the followers of other religions.

Often the prevailing social and religious norms are the main obstacles for women on their way to achieve a higher level of autonomy and independence. The more distressing fact is that, to many people wife-beating is an acceptable form of punishment if the wife is not performing household chores properly and/or if she is considered to be disobedient or is suspicious of committing any unacceptable thing (Abdullah and Zeidenstein 1982; Hartman and Boyce 1983; Schuler et al. 1996, 1998). For the same activity performed by men and women, most often the latter are held responsible by the community and the punitive measures taken only against the women. Domestic violence is often used to reinforce male dominance and nonegalitarian gender norms (Schuler et al. 1996, 1998; Bates et al. 2004) which will certainly have important implications for other marital outcomes including dowry, women empowerment and also for intra-household decision making. The minimum legal age at marriage is 18 years for females in Bangladesh and the practice of dowry was legally banned in the 1980s. The law regarding marriage registration was enacted in 1974. However, the overall situation has not changed largely due to lack of implementation of laws. The under-aged girls are

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5 This information comes from 'Population Census 2001, National Report (provisional)'. July 2003, Bangladesh Bureau of Statistics, Dhaka.

married overstating their age and the dowry has often taken the form of gifts. Therefore, here we are focusing on a country where (marriage) laws and their infringements co-exist.

3.2 Data and some basic descriptive statistics

The data used comes from a recent household survey conducted under a research project of the Bureau of Economic Research (BER) at Dhaka University, named *Capturing Intra-household Distribution and Poverty Incidence: A Study on Bangladesh*. The survey sample is made up of 1,039 households, drawn from 33 districts, with 704 households from rural areas and the remaining from urban areas. The sample is a random one unlike most studies in this field which are likely to suffer from the problem of selectivity bias because of the use of non-random sample. Like any other household surveys, the BER survey collected data on a wide variety of subjects, including household characteristics, demography, educational attainment and economic activities of household members, and consumption and expenditures on food and non-food items. However, there were three special features of this survey. First, unlike the most widely used technique of obtaining information on consumption through the 'recall method', the BER survey, by using specially trained enumerators, recorded the actual individual specific dietary intake by directly weighing the consumption of food items by household members. Second, the survey recorded the time spent by individual household members on different types of activities. And, another interesting dimension of the BER survey was to gather very detailed information on married women within the households in order to assess their relative economic status and bargaining power. All data corresponding to individual women's off-home income-earning works, within household income-earning activities, ability to make decisions on a wide variety of matters, assets brought at marriage, other unearned income, being subject to domestic violence, etc. were recorded by undertaking a quasi-participatory approach to information gathering. To a certain degree, because of the very sensitive nature of the issue, it is often difficult to conduct comprehensive research on domestic violence. In a conservative and male-dominated society like Bangladesh, the difficulties associated with data collection on domestic violence cannot be overstated. Taking this into consideration, the BER survey employed specially trained female enumerators, most of whom hailing from the same region where the survey was undertaken, with experiences of undertaking participatory research, who interviewed each married woman in person. The women were asked a wider range of questions regarding marriage, resources brought at marriage, participation in household income-expenditure activities, and their experiences of different types of domestic violence.

During the survey, information on five categories of domestic violence, as listed in Table 1, was gathered. Among these, the most prevalent form of violence is 'verbal abuse' which is followed by 'not allowed to meet parents' and 'physical abuse'. While 46.5 per cent of the married women experienced verbal abuse, 28 per cent reported experiencing physical abuse. Amongst the 1,232 women interviewed, 167 mentioned receiving threats of divorce and 146 reported threats of their husbands getting remarried. Henceforth, by the term domestic violence, we will indicate the occurrence of physical abuse and/or the threats of divorce and/or remarriage only.

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Table 1: Frequency of domestic violence

Type of domestic violence	Number of women reporting	Per cent of total women interviewed
Did not allow to meet parents	349	28.3
Threats of divorce	167	13.5
Threats of remarriage	146	11.8
Verbal abuse	573	46.5
Physical abuse	344	27.9
Total number of women interviewed	1,232*	-

Note: The column total will exceed the number of women interviewed because of multiple responses.

Figure 1: Age distribution of women reporting domestic violence
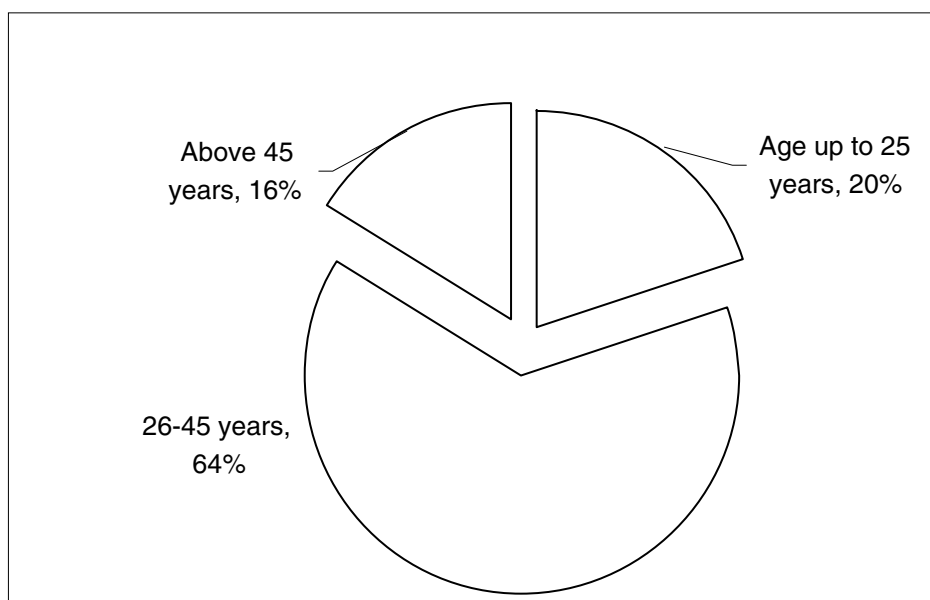
The highest number of women reporting domestic violence (Figure 1) fall in the 26-45 years age group (64 per cent), followed by up to 25 years (20 per cent) and above 45 years (16 per cent). Among the women aged at most 25 years, about 29 per cent are experiencing domestic violence. For 26-45 years and above 45 years age groups this rate is 35 per cent and 26 per cent, respectively.

Following Figure 2, more than half of the married women (a total of 655) have 1-10 years of education. About 41 per cent (500) are with no formal education, and only 6.25 per cent (77) have more than 10 years of education. Against this backdrop, it is found that, 54 per cent of the married women suffering domestic violence have no education, 44 per cent have 1-10 years of education and only about 2 per cent have more than 10 years of education. Among the married women experiencing no violence 34.2 per cent are with no education, 58 per cent have 1-10 years of education and about 8 per cent have more than 10 years of education.

Figure 2: Incidence of domestic violence and the level of female education

Frequency
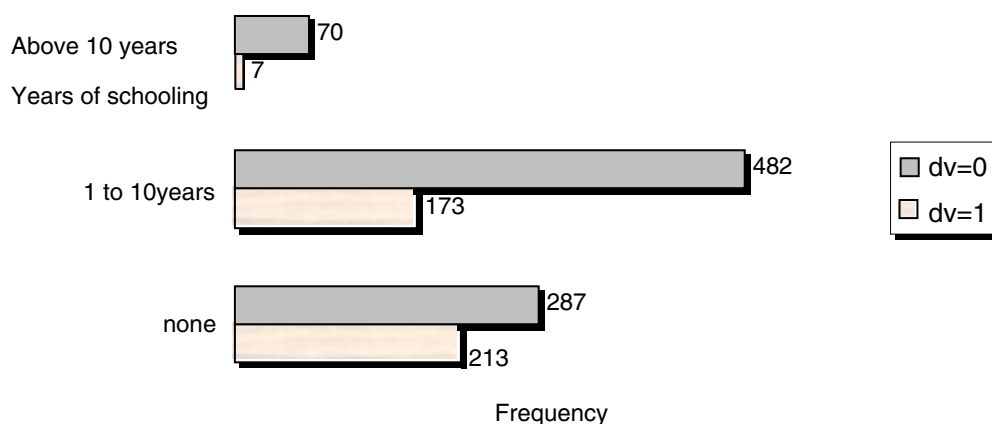
In terms of household income (monthly), as displayed in Figure 3, most of the married women (both subject to violence as well as not), fall in the lowest income group (i.e., less than Tk. 5,000). About 42 per cent of the women in this income group are being domestically abused. For the other income groups, the corresponding rates are much lower, ranging between 21 and 25 per cent.

Figure 3: Per cent of women subject to domestic violence by income groups

Per cent
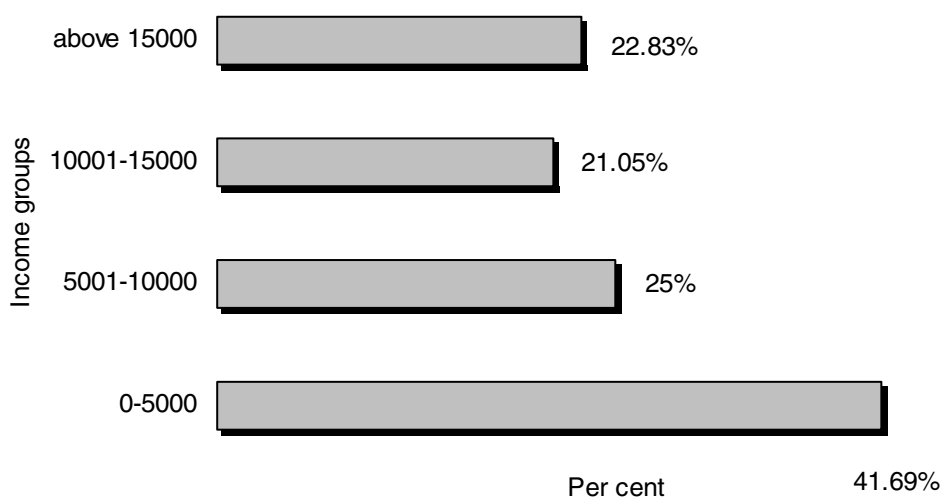
4 Domestic violence and resource allocated to women

4.1 Comparison of food consumption and non-food expenditure categories

So far we have been concerned only about the factors affecting the incidence of domestic violence. However, does a woman experiencing domestic violence get less food? Or, does the household, on the whole, spend a lesser amount of resources for her?

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These are the questions that have remained unanswered in the existing literature. These questions are important since they can reflect a broader picture, i.e. how domestic violence is related to the pattern of household resource allocation. There is now overwhelming evidence of relative bargaining power affecting the allocation of household resources, and in the light of these findings it is of interest to draw a comparative assessment of resources allocated to women who experience violence vis-à-vis their counterparts who do not. The dataset that is being used here gives us an opportunity to undertake such a comparative analysis. In Table 2 we compare women with and without the experiences of domestic violence in terms of their activity levels, food consumption, and non food expenditure. The level of activity is measured by an index which was calculated using individual level information of time allocation to various activities.[6]

Table 2 displays the mean differences and their *p*-values between the two groups of married women (with DV = 1 and DV = 0) across a number of food and expenditure categories which are worthy of consideration. The group of women reporting violence against them is, on average, not working less and when calorie intake is considered (within home, outside home and total), is found not consuming less compared to the group of woman experiencing no violence. These inferences are made on the basis of the finding of no significant mean difference between the two groups.[7] The difference in the calorie adequacy ratio, defined as the daily calorie intake divided by daily calorie requirement, for these two groups is also not significant at least at the 10 per cent level.[8] Since the quality of foods cannot be captured by merely looking at the calorie consumption, special attention is given to good foods (high quality food in terms taste and preference) such as, fish, meat, eggs, drinks and dairy products. Here, is now the hidden substance unveiled. The women experiencing domestic violence are obtaining significantly lower calories from various good food categories, as the mean differences are found to be significant at less than the one per cent level.

Personal expenses on eight expenditure categories, namely, cosmetics, transports, ready-made garments, cloth and sewing, footwear, health, entertainment and other personal items are also compared for the two groups. When all categories are combined, a significantly lesser amount of money is spent for women that are subject to domestic violence. These women have significantly lower expenses for cosmetics, ready-made garments, cloth and sewing, footwear and health care items. For the all eight expenditure categories reported, women subject to domestic violence have on average Tk. 170 lower monthly expenses.

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[6] For the construction of the activity index see the Annex (especially Annex Table A2).

[7] Small *p*-values (for example, less than 0.10) are an indication of statistically significant mean difference.

[8] Note that, although not significant, the mean difference for calorie intake is actually positive, implying that the mean calorie intake for women reporting domestic violence is actually greater than those of women not reporting such incidence.

Table 2: Comparison of mean activity index and expenditure on different Items (battered women vs. non-battered women)

Criteria	Mean difference (p-value)
Activity	0.012 (0.333)
Food consumption (in Kcal/day)	
Calorie intake at home	38.06 (0.276)
Calorie intake outside	6.08 (0.617)
Total calorie intake	44.14 (0.189)
Calorie adequacy ratio	0.0258 (0.112)
Fish consumption	-13.84 (0.000)
Meat and egg consumption	-6.88 (0.001)
Other good foods (drinks and dairy products)	-8.21 (0.000)
All good foods	-28.95 (0.000)
Non-food expenditure (in taka/month)	
Cosmetics	-2.33 (0.054)
Transport costs	-59.13 (0.117)
Ready made garments	-27.31 (0.000)
Cloth and sewing	-5.24 (0.02)
Footwear	-3.51 (0.000)
Health (including medical treatment)	-31.48 (0.054)
Entertainment	-0.741 (0.171)
Personal items	-40.36 (0.15)
Total (all eight expenditure categories)	-170.13 (0.001)

Note: The mean difference is computed as the mean for the women with domestic violence less the mean for the women without the experiences of domestic violence. The number of observations (including women in both groups) is between 1,222 and 1,230. p-values are in parentheses indicating the exact level of significance.

In the field of the relevant literature there exists a debate on whether the household is inequality averse or not in terms of food allocation to its members of different sex groups (e.g., see Pitt et al. 1990 and Rahman 2002). However, considering the quality of the food items, it has been shown that the intra-household inequality does exist and the discrimination is against females. Using the same BER data set, it has been shown that within the household, the prime age adult females, containing most of the married women, are in the most disadvantageous position (Razzaque and Toufique 2006). And, the above comparative assessment would suggest that, among these disadvantaged women, females experiencing domestic violence are in the worst position.

4.2 Impact of domestic violence across different income groups

From Figure 3 it is evident that the incidence of domestic violence is more prevalent in lower income groups, which essentially leads to the question: does the disparity between the two groups of women exist across all income groups? We divide all those

married women into 4 different groups, namely, monthly household income of up to Tk. 5,000, between Tk. 5,001 and Tk. 10,000, between Tk. 10,001 and Tk. 15,000, and above Tk. 15,000. Implicit here is the assumption that households falling in the same income bracket do not allocate significantly different amounts of food (measured in calories) and money to their members possessing comparable indicators. Based on this supposition, an average married woman of a particular income group experiencing domestic violence is compared with an average married woman of the same income group without such experiences.

Once again it is found that there is no statistically significant difference between the activity levels of the two groups of women across any of the income groups. Although total calorie intake yields similar evidence, the calorie adequacy ratio is significantly (at the 10 per cent level, however) higher for women reporting violence in the 10,000-15,000 income category. When calories generated from some preferred food items (fish, meat, eggs, milk, dairy products, etc.) are considered, except for the highest income group, the same group of women receive a significantly lesser amount of calories from a number of good foods. When non-food expenditure is considered, except for the third highest income category (where the two groups of women are not markedly different), significant differences in spending are evident, where the women are subject to domestic violence she is usually spending a lower amount. Hence, from Table 3 it can be inferred that within all the income groups there exist some disparity in favour of the women not experiencing domestic violence, either in terms of food consumption or in terms of non-food expenditure or both.

5 Determinants of domestic violence

5.1 Model-specification and the methodology

In this section an attempt is made to explain the probability of being subject to domestic violence. The dependent variable is then essentially dichotomous in nature. Based on the incidence of domestic violence (physical abuse) as well as intimidation (threats of divorce and remarriage), and without such incidence being reported by the married women interviewed, the set of married women is divided into two mutually exclusive subsets.

We first try to find out various factors that are perhaps responsible for physical abuse as well as intimidation of women. It is assumed that the incidence of domestic violence is influenced/determined jointly by the wife's and the husband's characteristics, marital characteristics, household's socioeconomic status and other household characteristics. Table 4 shows the variables considered followed by some description of the chosen variables.

Table 3: Comparison of food consumption and non-food expenditure across different income groups (women subject to domestic violence vs. women without such experiences)

	Monthly income up to Tk. 5,000	Monthly income: Tk. 5,001–10,000	Monthly income: Tk. 10,000–15,000	Monthly income above Tk. 15,000
Criteria	Mean difference (p-value)	Mean difference (p-value)	Mean difference (p-value)	Mean difference (p-value)
Activity	0.014 (0.514)	0.0007 (0.972)	-0.011 (0.708)	-0.016 (0.617)
Food consumption (in Kcal/day)				
Calorie intake home	68.89 (0.116)	13.84 (0.851)	191.25 (0.134)	37.48 (0.784)
Calorie intake outside	-9.04 (0.584)	24.95 (0.302)	-47.66 (0.089)	96.62 (0.106)
Total calorie intake	61.35 (0.149)	37.81 (0.584)	144.11 (0.255)	131.5 (0.26)
Calorie adequacy ratio	0.023 (0.285)	0.0133 (0.65)	0.0962 (0.077)	0.0951 (0.134)
Fish consumption	-9.05 (0.004)	-12.1 (0.027)	-6.76 (0.556)	-6.713 (0.418)
Meat and egg consumption	-1.42 (0.495)	-2.73 (0.542)	-9.62 (0.138)	-7.45 (0.282)
Other good foods	-3.26 (0.022)	-4.39 (0.159)	-16.10 (0.003)	-8.23 (0.484)
All good foods	-13.74 (0.001)	-19.29 (0.023)	-31.65 (0.033)	-22.40 (0.17)
Expenditure (in Tk./month)				
Cosmetics	1.48 (0.319)	-3.758 (0.133)	-3.31 (0.349)	-3.36 (0.572)
Transports	-2.97 (0.556)	-18.91 (0.008)	54.37 (0.126)	-348.68 (0.173)
Ready made garments	-7.04 (0.062)	-9.09 (0.238)	-12.29 (0.526)	-76.38 (0.004)
Cloth and sewing	-2.26 (0.136)	-0.711 (0.859)	-3.10 (0.58)	-4.51 (0.764)
Footwear	-0.99 (0.101)	-1.97 (0.123)	0.502 (0.884)	-5.08 (0.414)
Health	7.77 (0.522)	-6.39 (0.784)	-38.36 (0.181)	-171.63 (0.064)
Entertainment	0.29 (0.077)	-0.506 (0.464)	0.331 (0.888)	-2.240 (0.494)
Personal items	-11.51 (0.064)	-7.02 (0.808)	49.47 (0.711)	-89.76 (0.608)
Total (all 8 categories)	-15.23 (0.377)	-48.37 (0.248)	120.34 (0.434)	-701.67 (0.036)

Note: There are 557–566 women in the income group up to Tk. 5,000, 346–352 in the group Tk. 5,001 – Tk. 10,000, 152 in the group Tk. 10,001–Tk. 15,000, and 160 in the group of above Tk. 15,000. P values in parentheses. P values indicate the exact level of significance. 1, 5 and 10 per cent level of significance can be determined by p-values either equal to or less than, respectively, 0.01, 0.05 and 0.10.

Domestic violence (DV) can be associated with the woman's own age and particularly younger women are likely to be more vulnerable. Hence we categorize female age into different groups to capture the differences in its impacts on DV. Higher level of female education has been widely shown to have reduced the risk of violence. Education can affect violence in a number of ways. It is usually associated with economic well being as well as a better match in the marriage market. Besides, educated women are likely to be more aware of their rights and status, which may raise their threat points and thus reduce the threat of violence. However, up to a certain level education may have no significant impact. Husband's education will also have some impact on DV.[9]

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[9] Because of marriage market match, there is often a strong and positive association between the wife's and husband's education levels.

Table 4: List of potential determinants of domestic violence against women

Variable name	Description
Dependent variables is domestic violence (DV)	Whether the woman is subject to domestic violence or not. DV = 1 if yes, and 0 otherwise
Wife's and husband's characteristics:	
AGE Less than or equal to 25 years 26-45 years Greater than 45 years	Age of the woman
Education (EDN) None 1-10 years More than 10 years	Education of the woman
Husband's education (HEDN)	Husband's education
Woman's height (HEIGHT)	Height of the woman (in inches)
Participation in NGO (NGO)	Whether the woman participates in NGO activities (yes/no)
WINCOME	If the woman is involved in income generating activities (both within and outside home) (WINCOME = 1 if yes, 0 otherwise)
IGAO	If the woman is involved in income generating activities (off home) (1 = yes)
IGAH	If the woman is involved in income generating activities (in-house) (1 = yes)
Marital characteristics:	
RM	Whether the marriage was registered (RM = 1 if yes, 0 otherwise)
WRM	Wife's resource brought at marriage (in Tk.)
DOP	Dependency on the wife's parents (in Tk., annually)
SOR	Strength of the woman's network-of-relatives (in taka)
JA	Job assistance provided by the woman's family (JA = 1 if yes, 0 otherwise)
CG	Number of children in the age group 12 years and above
MC	Number of male children
PREG	If the woman was pregnant (PREG = 1 if yes, 0 otherwise)
FML	If mother/father-in-law(s) is (are) present in the family (FML = 1 if yes, 0 otherwise)
MIL	If mother-in-law is present in the family (MIL = 1 if yes, 0 otherwise)
FIL	If her father-in-law is present in the family (FIL = 1 if yes, 0 otherwise)
Woman's autonomy:	
CER	An index of woman's control over economic resources
PA	Woman's index of political awareness
MI	Woman's mobility index
DMI	Woman's decision making index
SHELTER	If the woman has other places to stay for a long time (1 = yes, 0 otherwise)
Household's economic status:	
HAI	Household asset index
HSI	Household status index
HCI	An index of economic crisis facing the household
Other household characteristics:	
R	Religion (R = 1 if Muslim, 0 otherwise)
RU	Whether the household is in a rural or urban area (RU = 1 if urban, 0 otherwise)

Woman's height is used here as a proxy for both beauty as well as physical strength and hence an indicator of her productivity to a larger extent. Being a proxy for the woman's 'beauty and strength', it is expected to exert a negative influence on the risk of DV. Stronger women are also thought to be better able to perform many household activities (for example, corn threshing and husking, fetching water from a distant source, taking care of a big rural family, etc.), which could potentially reduce the risk of DV (also violence against husband is not a rare phenomenon).[10]

'Whether the woman participates in the NGO activities or not' may also have some influence on the level of DV. Here, the influence may depend on a number of factors. Her participation in savings and credits programmes adds to the level of economic well-being of the family, raising her within-household status and empowerment thereby contributing to the reduction of DV. On the contrary, intra-household conflicts arising out of the decisions regarding spending of loans and repayment can also increase the incidence of domestic violence.[11]

The employment status of the woman, i.e., participation in income generating activities may also influence the incidence of domestic violence. If a woman earns, her within household status is likely to be higher which in turn may imply a reduced risk of violence. We divide female earning activities into two categories, off-home income earning activities (such as, wage work and salaried employment) and in-house income generating activities (such as, raising livestocks, homestead gardening, etc).

If the marriage is registered, the legal provisions for solving the marital problems are more accessible. In the case of unregistered marriages, it is very difficult to receive adequate legal supports which mostly affect women. Therefore, in a registered marriage the woman is likely to be in a relatively secured position, at least legally, compared to the woman in an unregistered marriage. For Muslim women it could be possible to consider the 'den mohr' (dower) as the indicator of security, but most often a significant portion of the *mohr* is specified as paid at the time of marriage. In addition, the woman usually, unless deserted/divorced, does not claim the dower. We consider the wife's resources brought at marriage that include dowries and all other assets (gifts and cash). Its impact on DV may not be predicted a priori. While higher marital asset may protect the woman against DV by raising her status (or bargaining power) in the husband's family, it can also instigate the husband to demand more which may lead to threat and/or incidence of physical abuse.

The total value of gifts (including cash) that the wife received from her close relatives excluding the dowry, parental and own resources at the time of marriage may act as an indicator of the strength of her network-of-relatives. This may exert negative influence on DV since the stronger the network, the higher is the probability that the husband will face the consequences of his misdeeds. If the wife continues to receive gifts (such as, grains, food, clothes, and other gifts) and cash support from her parental home, it may influence her probability of becoming subject to DV. Again, if the husband or any of the

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[10] According to Koenig et al. (2003) verbal abuse against males was 18.7 per cent while the rate of physical threats or violence was 5.4 per cent (the study was for Uganda).

[11] See Kabeer (2001); Schuler et al. (1998, 1996); Rahman (1999).

woman's in-laws has received some other support and assistance (for example, job for the husband or for his kin or money for job searching/securing etc., which are known to common practices in Bangladesh's marriage market) from her family, the woman status in the husband's house is likely to rise substantially leading to a fall in the extent/incidence of DV.

Number of children in a family may also reduce the risk of violence, however in poor families the outcome may be the reverse.[12] Again in societies where male preference is the norm, presence of higher number of male-offspring may exert negative influence on DV. Additionally, in the presence of grown-up children, the husband may have to change his behaviour towards the wife, as the children can support their mother and thus help raise her bargaining power. We try to capture this by constructing a variable if the woman has children in the age group 12 years and above. Also, grown-up children would mean that the mother is more likely to be a woman of higher age with a stable marriage.

In a traditional Bangladeshi society, an ill-disposed relationship is usually assumed to exist between a woman and her mother-in-law which, if true, will certainly influence the woman's relation with her husband. To capture such influence we introduce a dummy variable indicating the presence or absence of the mother-in-law in the household. We also consider the impact, if any, of the presence of the wife's father-in-law in the household.

It is often hypothesized that women with a higher degree of autonomy will be less vulnerable to DV as their threat points/protective abilities are higher compared to other women. On the contrary, increased autonomy may raise intra-household discontents/conflicts which may actually accentuate the risk of DV. We construct several indices, given that autonomy is a multidimensional phenomenon, of female autonomy and examine what role they play in determining DV. The data set we used provides detailed information about women empowerment and status and thus has enabled us to construct the following indices.[13]

Index for control over economic resources: the control over economic resources can have some influence on DV. For this paper we construct an index of control over resources by combining the information on whether the woman in question owns land and if she has some money at her disposal. Amount of total land owned by the woman may symbolize her degree of control over economic resources to a large extent given the social context of Bangladesh, existing landholding patterns, and the importance of land as an asset. However, we consider only the incidence of land ownership for woman, not the actual amount of landholding because within a household the former is

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[12] For example see Schuler et al. (1996) and Rao (1997).

[13] Given the socio-cultural aspects of the setting, though these indicators may be useful, all are not entirely exogenous. However, the use of such indicators is not uncommon at all. Hashemi et al. (1996) and Razzaque (2005) used various indices for women empowerment. Besides, Jejeebhoy (1998) has formulated four indices to measure women's autonomy, namely, (1) decision making authority, (2) mobility, (3) women's access to economic resources and (4) women's control over economic resources.

the more meaningful one. For the second indicator of control over economic resources, we consider if the woman keeps some money on her own for self-expense and security purposes. In both instances (i.e. landholding and keeping money) we ascribe 1 for an affirmative answer and 0 for a no. Thus the index ranges from 0 to 2.

Decision making index: we consider 12 categories of expenditure and ask the married woman if she can take their purchasing decision independently.[14] We give 1 for each 'yes' and 0 for each 'no/joint decision'. Hence the value of this index ranges from 0 to 12.

Mobility: to construct the mobility index, the respondents were asked if they visited a number of seven places during the last 12 months without consulting with their husbands or relatives.[15] For each kind of place, the answer 'yes' is given a score of 1 and the 'otherwise' is awarded 0. The index of mobility thus ranges from 0 to 7 with the higher value indicating a greater mobility.

Political awareness: to measure the woman's political awareness we used 5 questions that included the name of some political figures and the way the woman exercised her voting power. Following the similar procedure we construct this index whose value lies between 0 and 5. One's political awareness may reflect her knowledge level regarding current issues and also may indicate her access to TV/radio and newspapers. Again if she exercises her voting power without consulting with or being influenced by others, this will indicate her ability to take independent decisions.

Shelter: we ask the woman if she has any place (except the husband's house) to stay for a long time (more than 6 months) without causing any pecuniary difficulties for the shelter provider. In our socio-cultural context of Bangladesh this may be important because many women are enduring within household oppression as they have no suitable place to go.

The household's socioeconomic status is likely to affect the incidence of domestic violence. Family income is often argued to be a good indicator of a family's socioeconomic status. However, the use of income will provoke the problem of endogeneity, as some other variables in the model will substantially explain the household income. In addition, there is no denying that, household incomes are subject to serious measurement errors. But here the problem is more severe as household income is a narrow indicator of household socioeconomic status in the sense that it cannot apprehend the various social and cultural aspects of the environment in which the woman resides.[16] To avoid these problems, we construct three indices to be used as proxies for household income as follows:

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[14] These are: (1) small purchases (food), (2) small purchases (personal items), (3) utensils, (4) apparels for children, (5) sarees (women's traditional wear), (6) apparel items for male, (7) education related expenses, (8) medical expenditures, (9) house repairing, (10) buying and selling cattle, (11) leasing land, and (12) purchasing such major items such as land, boat, rickshaw, etc.

[15] These include, (1) nearby relatives/friends, (2) haat/bazaar in the locality, (3) nearest hospital/clinic/doctor, (4) cinema/fair, (5) nearby banks/post office/public offices, (6) NGO offices/taining programmes, and (7) any other similar places reported by the interviewees.

[16] Using household expenditure would not certainly address these issues adequately.

Household asset index: an index of household asset is constructed based on 32 different types of household belongings (goods and chattels).[17] We ascribe 1 for the presence of each item and 0 for its absence and thus the index will assume a value between 0 and 32 for each household.

Household status index: we construct another index to reflect the household's status based on 4 indicators – whether the household has a separate kitchen, substance (brick/cement/rod/tin/wood/tiles/leaves) used to build the roof, if pucka latrine is used and whether supply/tube well water is the source of drinking water. The value of this index lies between 0 and 4.[18]

Crisis index: crisis/income loss may also affect the risk of violence. A husband facing pecuniary difficulties may force his wife to bring money from her parental home. As well he may maltreat her out of frustration and fury resulting from the income loss/crisis. We compute the total income loss (expressed in taka) considering 20 different kinds of crises and their impacts.[19]

Whether the household is in rural or urban area may also have some influence on the incidence of DV. Urban areas are usually characterized by higher income, higher education as well as greater cultural diversities relative to rural areas. To apprehend these locational impacts, we introduce a dummy representing the situation of the household. A dummy variable representing the religion of the household (inter-religion marriage is a *rara avis* in Bangladesh) is also included in the specification.

5.2 Estimation and the results

The logistic regression was used to estimate the model. At first we estimate a basic model which considers wife's and husband's individual characteristics, marital characteristics, and a few household characteristics. Then, the model is extended to include the several indices of female autonomy and household's socioeconomic status that were constructed above. While in the basic model we consider WINCOME and FML, in the extended model their segregated forms, IGAO and IGAH, and MIL and FIL are inserted separately.

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[17] The goods are: radio, cassette player, camera, bicycle, motor cycle/scooter, motor car, refrigerator, washing machine, fan, oven (electric/gas), toaster, heater, television, VCR/VCP, dish antenna/decoder, cell phone, pressure lamp, sewing machine, tube well, wrist watch, wall clock, power tiller, tractor, threshing-machine, power pump, shallow tube well, cattle, plough, insecticide spraying machine, generator, fishing materials (net, boat, trawler) and loom.

[18] A 'yes' answer related to three indicators was given a value of 1 each. In the materials used for roof, the use of brick, cement, and rod was given a value of 1, while for all other materials a value of 0 was assigned.

[19] These crises are: death of an earning member, crop damage, theft/robbery, income loss due to illness, loss of cattle, loss of land/home because of river erosion, flood/cyclone, large medical expenditure, money loss, eviction from land, landed property suit, subject to serious physical/psychological hazards, being kidnapped, being victims of acid throwing, snatching, terror threats etc., police harassment, court/police expenses, a family member is murdered, daughter's marriage, job loss, house being burnt, and family disputes.

The variables common to both the models, except the rural-urban dummy, have the same sign in both instances and the inferences about their significance do not change noticeably. The woman's age, self education and husband's education affect the likelihood of DV negatively and significantly. On the other hand the impacts of NGO participation and resources brought at marriage are positive. However, though the former impact is significant, the latter is not. If the woman participates in income generating activities (either off-home or in-house), the risk of violence rises markedly. To examine this impact more rigorously, in the extended model, we will separate women participating in in-house earning activities from those involved in off-home earning activities. The presence of mother or father in-law in the family does not affect the likelihood of violence significantly. In the extended model, the impact of the presence of father-in-law and that of the mother-in-law is considered separately.

Now the focus is mainly on the findings of the extended model. The age category 26-45 years was used as the base category of married women. Relative to them, the young married women, aged not more than 25 years, are less likely to experience domestic violence. But since the 95 per cent interval on the odds ratio includes the value of 1, by convention this variable is not a useful predictor.[20] However if a woman falls in the highest age category (greater than 45 years of age), her likelihood of being beaten/intimidated is significantly reduced with the odds decreasing by 38 per cent.

Education, in the model, in all its forms, exerts significant negative influence on the occurrence of domestic violence. In the extended model, married women with 1 to 10 years of education are 0.62 times likely (odds is 38 per cent lower) to suffer violence. For women having more than 10 years of education, the odds is reduced by 75 per cent. This indicates the pivotal role that higher education of women can play in combating domestic violence and raising the status of women. Again the estimated coefficient associated with HEDN is significantly negative, implying that, *ceteris paribus*, the higher the level of husband's education the less likely it is that the wife will experience domestic violence. Additionally since husband's education level can be an effective signal of economic status, economic reasons (if any) behind the incidence of domestic violence are weaker here. The height of the woman, used as a proxy for the woman's 'beauty and strength', though affects the woman's likelihood of suffering domestic violence negatively, the impact is not significant. The woman's participation in NGO activities is also unable to impact domestic violence in a desired way as the sign on the variable turns out to be positive.

If the woman earns from an outside-home-activity, her risk of violence, though reduced, the reduction is not statistically significant. But if her earning source is the within-household activities, the probability of DV is significantly increased. The latter finding though is in contrast to the usual perception; intra-household conflict may result from the dispute regarding the control over those informal earnings.

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20 The 95 per cent confidence interval is [0.5603936, 1.221389].

Table 5: Determinants of domestic violence against women

Variable	The basic model			Extended model		
	Odds	Log-odds	P-value	Odds	Log-odds	P-value
Age up to 25 years	0.926	-0.076	0.688	0.827	-0.189	0.340
Age greater than 45 years	0.572	-0.557	0.004	0.619	-0.479	0.018
Education (1-10 years)	0.497	-0.699	0.000	0.619	-0.480	0.003
Education (more than 10 years)	0.147	-1.92	0.000	0.243	-1.41	0.003
HEDN	0.962	-0.038	0.009	0.971	-0.028	0.061
HEIGHT	0.992	-0.008	0.701	0.999	-0.0005	0.981
NGO	1.29	0.259	0.078	1.34	0.298	0.049
WINCOME	1.31	0.273	0.052	-	-	-
IGAO	-	-	-	0.974	-0.026	0.882
IGAH	-	-	-	1.39	0.334	0.030
RM	1.07	0.068	0.653	1.15	0.143	0.357
WRM	1.02	0.016	0.476	1.02	0.019	0.414
DOP	1.01	0.006	0.768	1.00	0.007	0.724
SOR	0.974	-0.026	0.164	0.980	-0.020	0.307
JA	2.91	1.07	0.114	2.90	1.06	0.145
CG	0.910	-0.094	0.202	0.979	-0.020	0.797
MC	1.05	0.053	0.479	1.01	0.012	0.874
PREG	0.898	-0.107	0.779	0.800	-0.222	0.567
FML	0.717	-0.332	0.143	-	-	-
MIL	-	-	-	0.839	-0.175	0.457
FIL	-	-	-	0.239	-1.43	0.066
SHELTER	-	-	-	1.01	-0.013	0.926
CER	-	-	-	0.862	-0.148	0.246
PA	-	-	-	0.905	-0.099	0.057
MI	-	-	-	0.883	-0.123	0.091
DMI	-	-	-	1.02	0.023	0.388
HAI	-	-	-	0.730	-0.314	0.005
HSI	-	-	-	0.735	-0.306	0.123
HCI	-	-	-	1.01	0.016	0.313
R	0.697	-0.360	0.275	0.666	-0.407	0.224
RU	0.943	-0.058	0.695	1.09	0.089	0.575
Constant	-	0.588	0.642	-	0.978	0.442
Number of observations		1224			1224	
Pseudo R^2		0.0664			0.0849	

Note: Variables WRM, DOP, SOR, HAI, HSI and HCI are in logs. Log-odds ratios are the estimated parameters from the logit regression. *p*-values indicate the exact level of significance. 1, 5, and 10 per cent level of significance can be determined by *p*-values either equal to or less than, respectively, 0.01, 0.05, and 0.10.

The marital characteristics namely the registration of marriage, wife's resources at marriage, dependency on the wife's parents, strength of the wife's network of relatives and job assistance received from wife's parents are unable to influence the incidence of domestic violence markedly. But, it is important to note that assets or resources transferred or other types of assistance from the wife's family have not only been unable to protect the woman from intra-household violence but actually reinforces the likelihood of domestic violence, though the coefficients are insignificant individually. This might imply an ever increasing demand for resources from wife's family. The strength of the wife's network of relatives, notwithstanding, reduces (insignificantly) the likelihood of domestic violence.

The number of children greater than or equal to 12 years of age has negative influence on domestic violence. However the impact fails to register statistical significance. Also, the number of male children does not affect the outcome variable significantly. The pregnancy status of the woman is also unable to exert any significant influence. Both the presence of the mother-in-law and the father-in-law reduce the woman's likelihood of suffering violence. While the impact of the mother-in-law is insignificant, that of the father-in-law is significant implying that the presence of the father in the family may restrain the violent behaviour of the son.[21]

As regards the indicators of women's autonomy, the political awareness index and the index of mobility affect women's probability of being domestically abused significantly and negatively. The effects of other indicators – shelter, control over economic resources and the decision making index are not statistically significant.

All the indices of household economic status are with desired signs. If the household asset index is one unit higher, the odds-ratio is decreased by 27 per cent and this reduction is significant at less than the one per cent level. The household status index also influences domestic violence negatively and it is found that the bigger the crisis faced by the household the greater is the chance that the wife will be subject to violence. However, both the impacts of status and crisis are not significant. Both the religion and location dummies are found not to have any significant effect.

6   Domestic violence and resource allocated to women: regression results

Now we try to explain the disparity between the women of the two groups using standard regression analysis. The analysis will be undertaken with respect to four principal concerns, namely, calorie adequacy ratio (CAR),[22] proportion of individual energy due to good food (GFS), food expenditure allocated to the woman (FEX) and the woman's non food expenditure (NFEX). Essentially, four separate regression models will be employed to explain the indicators of our choice. First, a general model with respect to individual CAR is specified, which then can be applied to other cases with some necessary modifications.

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[21] This may reflect the influence of extended family. Koenig et al. (2003) using Bangladeshi data found negative impact of extended family on the risk of violence.

[22] For the procedure of calculating the calorie adequacy ratio see the Annex.

It is assumed that the CAR of a female will depend on the occurrence of domestic violence and on some individual as well as household characteristics. Among the individual characteristics, a woman's age, pregnancy status, participation in earning activities (both in-house and outside house) and health condition (i.e., whether suffering from any illness at the time of the survey) are included. For the household characteristics, per capita household expenditure, and the age-sex distribution of the household members and location are included. Briefly, the specification can be expressed as:

$$CAR_i = f [PCE, DV, Z]$$

Where PCE is per capita expenditure, DV is a dummy variable indicating the prevalence of domestic violence, as described earlier, and Z represents a set of individual and household characteristics.

Due to the limitations associated with income and expenditure in regressions involving calorie adequacy ratio, we use three constructed indices of socioeconomic status. On the other hand, the incidence of domestic violence, as has been determined earlier, will also depend on some of the explanatory variables like the woman's age, her earning status, etc. Applying OLS will therefore yield inconsistent estimates because of the perceived correlation between DV and the error term. Hence we will employ the 2SLS estimation procedure here using the variables that were previously used to model DV.

The consistent 2SLS estimation of female calorie adequacy ratio (column 2 in Table 6) seems to suggest that female calorie adequacy ratio is independent of the household's socioeconomic status. This might be due the fact that food is a basic necessity and even the relatively inexpensive and monotonous cereal-based diets can be calorie-rich. Woman's age (greater than 45 years) and the household age-sex composition are however crucial for her calorie adequacy ratio. Involvement in income earning activities, both in-house and outside-the-house, exert positive influences on CAR as expected, the impact of the former being statistically significant. The results show whether the woman is subject to domestic violence or not (DV) is unable to exercise any significant influence on CAR. The latter finding is consistent with our previous findings of Table 2 where neither the differences (between women subject to domestic violence and the women without such experiences) in the gross calorie measures nor the difference in calorie adequacy ratio was significant.

The taste of and the preference for food items are also important when investigating the disparity in food allocation. The regression results (column 3, Table 6) show that the indicators of socioeconomic status of the household are important determinants of a woman's good food consumption.[23] Involvements in income generating activities, whether it is in-house or off-home, are found to have no significant influence. Illness (exerting positive influence) and age-sex distribution of the household turn out to be important determinants.[24] Most importantly, domestic violence is found to be significantly reducing woman's share of energy coming from the preferred food items, supporting the previously shown mean difference results in Table 2.

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[23] In this case, both the asset index and status index are significant at less than 1 per cent level.

[24] The positive and significant coefficient on illness should not be considered as a surprise. As, in many households unwell people are better treated.

Table 6: Regression results (2SLS estimates)

(1)	(2) Individual calorie adequacy ratio of women	(3) Proportion of personal calorie generated by preferred foods	(4) Monthly food expenditure (individual)	(5) Monthly non-food expenditure (individual)
		Dependent variable		
DV	0.113 (0.184)	-0.038 (0.000)	-0.494 (0.001)	-1.86 (0.000)
HH asset index	0.020 (0.197)	0.007 (0.000)	0.082 (0.003)	0.388 (0.000)
HH status index	0.017 (0.679)	0.003 (0.003)	0.105 (0.024)	0.081 (0.497)
HH crisis index	0.002 (0.297)	0.0003 (0.189)	0.011 (0.001)	0.016 (0.057)
Age • 25 years	0.025 (0.269)	-0.001 (0.612)	-0.056 (0.169)	0.022 (0.833)
Age > 45 years	0.100 (0.000)	-0.002 (0.545)	-0.026 (0.539)	-0.399 (0.000)
Involved in off-home earning activities (1 if yes)	0.007 (0.724)	-0.002 (0.456)	-0.012 (0.733)	0.063 (0.494)
Involved in in-house earning activities (1 if yes)	0.031 (0.078)	-0.001 (0.651)	0.057 (0.081)	0.022 (0.789)
Illness (1 if yes)	0.014 (0.440)	0.004 (0.078)	0.049 (0.145)	0.563 (0.000)
Pregnant (1 if yes)	-0.044 (0.377)	-0.003 (0.645)	-0.047 (0.602)	0.155 (0.506)
Total male preschoolers	0.003 (0.828)	-0.002 (0.149)	0.009 (0.706)	-0.123 (0.069)
Total female preschoolers	0.043 (0.003)	-0.005 (0.004)	0.049 (0.063)	-0.063 (0.358)
Total male schoolers	0.004 (0.740)	-0.004 (0.003)	-0.029 (0.204)	-0.125 (0.034)
Total female schoolers	-0.002 (0.846)	-0.002 (0.180)	-0.016 (0.463)	-0.010 (0.859)
Total male young adults	0.022 (0.051)	-0.003 (0.007)	-0.016 (0.443)	-0.146 (0.007)
Total female young adults	-0.002 (0.827)	-0.002 (0.120)	-0.018 (0.410)	-0.077 (0.175)
Total male prime age adults	-0.006 (0.637)	-0.0005 (0.752)	0.007 (0.744)	-0.037 (0.554)
Total female prime age adults	-0.003 (0.870)	-0.00007 (0.971)	-0.087 (0.004)	-0.168 (0.033)
Total male elderly	-0.009 (0.677)	0.003 (0.253)	0.068 (0.091)	0.113 (0.279)
Total female elderly	0.009 (0.676)	-0.002 (0.480)	-0.123 (0.004)	-0.435 (0.000)
Location	-0.011 (0.550)	0.004 (0.105)	0.127 (0.000)	0.104 (0.233)
Constant	0.838 (0.000)	0.036 (0.000)	6.31 (0.000)	5.12 (0.000)
N	1198	1199	1199	1199
F	2.39 [p = 0.000]	10.87 [p = 0.000]	7.28 [p = 0.000]	12.2 [p = 0.000]

Note: HH asset index, HH status index, HH crisis index, food expenditure and nonfood expenditure are in logs. Endogenous variable DV is instrumented by the predictors listed in the table. p-values are in parentheses, indicating the exact level of significance.

In column (4) of Table 6, 2SLS estimates of food expenses allocated to women is reported. Both the asset and status indices of the household are again found to be exerting positive and significant influences, while the household crisis index is associated with the monthly food expenditure significantly.[25] In addition, woman's

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[25] By construction, this index captures a number of crises occurred in the past 12 months and there is a chance that many of them occurred a couple of months before the survey was undertaken. So there is a possibility that the household has come out of the crisis period at the time of the survey. More

income received from home-based activities appears to have significant positive effect. Also more expenses are allocated to urban women compared to their rural counterparts. The variable of our prime interest, DV, significantly reduces the food expenditure of the woman. In a similar fashion, the non-food expenses allocated to woman are explained in the last column of Table 6, where the impact of DV is also negative and statistically significant. Among other factors, household's socioeconomic status, her age and household age-sex composition are of greater importance. Higher non-food expenses are allocated if the woman is suffering from some kind of illness.

7   Conclusion

Although there are studies that have focused on the determinants of domestic violence and its health outcomes for the women undergoing such traumatic experiences, its implications for resources allocated to women have not been the subject matter of any serious scrutiny. This paper has made an attempt to fill this research gap by studying the factors contributing to domestic violence and by making a comparative assessment of resource allocated in favour of women reporting domestic violence against them vis-à-vis those who do not report such incidence, using a recent survey of Bangladeshi households with special emphasis on capturing intra-household dynamics.

One of the most important findings of the study is that women's own as well as husband's education reduce the risk of within household violence against women significantly. The socioeconomic status of the household is also found to have significant negative influence on the domestic violence. Contrary to the general perception, the findings, however, reveal that women's participation in NGO programmes and their involvement in home-based income generating activities do not reduce the likelihood of domestic violence.

When resources allocated to women with and without the experiences of domestic violence are considered, no statistically significant difference between the average calories consumed by women of both groups can be found. However, there was some robust evidence suggesting that women subject to domestic violence receive significantly lower calories from the preferred food items such as, fish, meat, eggs, drinks and dairy products. Furthermore, this group of women is allocated significantly lower within household food and non-food expenses compared to their counterparts who do not report such incidence. Regression analyses controlling for household socioeconomic conditions and various other factors and taking into consideration of simultaneous determination of the probability of being subject to such violence confirm this discriminatory (between the two groups of women) resource allocation behaviour. Therefore, the impact of domestic violence is not only limited to the immediate physical and psychological health impact, but is also transmitted to other spheres of a woman's life.

The importance of education in reducing domestic violence as suggested by the analysis in this paper underscores the need for investing in education, and especially in female

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importantly, this index includes a wide array of crises many of which require that the household keep/hold sufficient money/assets as a crisis coping strategy. In that case a good amount of that money is likely to be channeled to the food budget.

education in combating the problem of domestic violence. Husband's education also turns out to be an important deterrent of such violence against women. Assets at marriage (including dowry) and various current/previous monetary and non-monetary assistances from the wife's family cannot safeguard the wife against domestic violence.[26] Also, our results reveal that policies designed to raise female autonomy as well as the socioeconomic status of the household will also have some protective effects for women.

Some caveats of our study need to be taken into consideration, which may encourage future research on this subject. Because of the unavailability of data, it was not possible to consider other types of domestic violence (such as, sexual abuse, violence against women by other members apart from husbands, and violence against children). Since our focus was on married women with spouse present only, it might understate domestic violence. The findings regarding the role of different earning activities by women in reducing domestic violence and the somewhat counterintuitive effect of participation in NGO activities may need to be studied further. While previous research on Bangladesh has pointed out a possibility of adverse empowerment effect of participation in NGO activities due to a rise in tension with regard to use of resources, the results of this paper may need to be tested further.[27]

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[26] This is in contrast to findings of Jejeebhoy and Cook (1997), who reported a protective impact of dowry.

[27] In the present dataset, 326 women out of a total of 1,227 (i.e. 26.5 per cent) are participating in NGO activities.

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Annex

Calculating individual calorie requirements

It is desirable that an individual should get the expended energy per unit of time (per day for convenience) to maintain existing health. Broadly, total energy expenditure of an individual includes expenditure at rest and during physical activity. The values of these two components depend on individual-specific factors like age, sex, body weight and composition, physiologic state (e.g. growth, pregnancy, lactation) and on some natural factors. Resting energy expenditure (REE) is the starting point in measuring calorie requirements and is defined as the energy expended by an individual at rest under thermally neutral conditions. Basal metabolic rate (BMR) is defined to be the REE soon after awakening in the morning measured at least 12 hours from the last meal. In practice the variation in measured REE and BMR is very low and in literatures these two terms are used interchangeably.

Generally, REE is the largest component of calorie requirements if physical activity is not too great. It depends largely on physical characteristics like weight, height, sex and age. In the literature REE is measured using several empirically derived equations. In this paper we have used the equations from the WHO (1985), which are given below.

Annex Table A1: Equations for predicting resting energy expenditure from body weight[a]

Sex and age range (years)	Equation to derive REE in Kcal/day	R[b]	SD[b]
Males			
0-3	(60.9 x wt[c]) - 54	0.97	53
3-10	(22.7 x wt) + 495	0.86	62
10-18	(17.5 x wt) + 651	0.90	100
18-30	(15.3 x wt) + 679	0.65	151
30-60	(11.6 x wt) + 879	0.60	164
>60	(13.5 x wt) + 487	0.79	148
Females			
0-3	(61.9 x wt) - 51	0.97	61
3-10	(22.5 x wt) + 499	0.85	63
10-18	(12.2 x wt) + 746	0.75	117
18-30	(14.7 x wt) + 496	0.72	121
30-60	(8.7 x wt) + 829	0.70	108
>60	(10.5 x wt) + 596	0.74	109

Notes:

[a] From WHO (1985). These equations were derived from BMR data.

[b] Correlation coefficient (R) of reported BMRs and predicted values, and standard deviation (SD) of the differences between actual and computed values.

[c] wt is weight of person in kilograms.

Source: Adapted from WHO (1985).

The equations in the above table provide approximated values of REE that are widely accepted. This set of equations does not include height as this variable was found not to be statistically significant in determining REE.

Energy expenditure is largely influenced by the characteristics of physical activity, which can be of many sorts and of different intensities. Defining physical activity and its inclusion into the measurement of energy requirement is of immense importance as it is argued to be the second largest component of energy requirement (after rest). The traditional approach of defining physical activity by occupation categories is inadequate or not the closest approximation. This is because individuals perform different types of activities every day to fulfill the economic and social responsibilities and allocate time to maximize utility out of those activities. Different types of activity require different levels of energy expenditure and energy expenditure of a particular activity is an increasing function of time allocated to the activity. Thus, in measuring energy requirement one should incorporate not only activities but also the time allocation. As a result we have used a weighted average of activity factor where the categorization of activities and also the values of activity factor associated with each category are taken from NRC (1989) and the weights are the allocated time in each activity per day, which comes from the survey data. A total of 31 types of activities are considered in our study and they are then categorized into five categories namely resting, very light, light, moderate, and heavy according the intensity of energy expenditure as the names suggest. Table A1 is reproduced from NRC (1989) report with the activity types considered in each category in our study.

Annex Table A2: Approximate energy expenditure for various activities in relation to resting needs for males and females of average size

Activity category	Activity	Representative value for factor per unit of activity
Resting	Sleeping, eating, drinking	REE × 1.0
Very light	Office work, work in own business, looking after crops, looking after poultry and livestock, social and political activity, others	REE × 1.5
Light	Collecting firewood, fishing, masonary, carpentry, weaving, handicrafts, walking, transportation, work at school, shopping, cooking, domestic work, washing clothes and dishes, looking after the children and elderly, playing games, religious activity	REE × 2.5
Moderate	Ploughing, weeding, fetching water, riding bicycle, boating, harvesting crops, leveling crop lands, throwing fertilizers in the fields, non-mechanical irrigation	REE × 5.0
Heavy	Earth digging, brick-breaking, carrying loads, rickshaw-van pulling	REE × 7.0

Source: NRC (1989).

To make the time allocation representative an average of three days is taken for each individual. The weighted average of the activity factor is then used as multiple of REE to get to the approximate value of energy requirement.