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Are Effects of Violence on Life Satisfaction Gendered? A Case Study of Indigenous Australians

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Are effects of violence on life satisfaction gendered?

A case study of indigenous Australians

Draft

Abstract

Violence related Australian statistics reveal a higher prevalence of violence among indigenous Australians than non-indigenous Australians. Using the latest National Aboriginal and Torres Strait Islander Social Survey (NATSISS) (2014/15) available from the Australian Bureau of Statistics, this study investigates the socio-economic and demographic factors that influence the likelihood of physical violence among indigenous Australians and the effects of physical violence on life satisfaction, with a special focus on gender differences in such effects. The results indicate that while gender is an important determinant of violence victimisation, homelessness, alcohol and substance consumption, a victim of the stolen generation and remote living increase the likelihood of physical violence victimisation. Our results also reveal that, while physical violence negatively affects the life satisfaction of both women and men, exposure to physical violence reduces the life satisfaction of indigenous women more than indigenous men.

Key words: physical violence, gender, life satisfaction, indigenous Australians

JEL Codes: D1, D6, Z10

1. Introduction

The high prevalence of violence in Australia and worldwide places a huge burden on communities, especially on women and children, and hence considered a critical social policy issue. According to the *Australian Bureau of Statistics* (ABS), in Australia, 2 in 5 people have experienced at least one incident of violence since the age of 15 (ABS 2017). Although both men and women could be victims of violence, the nature of violence that men and women face are quite different. While men are more likely to experience violence from strangers and in a public place, women are more likely to experience violence from a known person and in their home. Family, domestic and sexual violence is considered as the most pervasive forms of violence experienced by women and children (Council of Australian Governments 2011). World Health Organisation (WHO) estimated that about 1 in 3 (35%) women worldwide have experienced either physical and/or sexual intimate partner violence or non-partner violence in their lifetime (WHO 2017). It is identified that indigenous women, young women, pregnant women, women separating from their partners, women with disabilities and women experiencing financial hardship are at greater risk of violence in Australia (Bryant 2009; Council of Australian Governments 2011; Willis 2011).

Studies have shown that indigenous Australians experience violence at rates that are higher than non-indigenous Australians (Bolger 1991; Bryant 2009). It is a general belief that indigenous Australians are less likely to disclose violence by a family member (Willis 2011), and hence the actual figures of indigenous family violence could be even higher and the broad spectrum of experiences may not be accurately captured. In relation to Aboriginal and Torres Strait Islander communities, family violence is the preferred term for violence as they possess complex and extended family and kinship relationships in which violence can occur. Many authors have linked family violence among indigenous Australians to the social disadvantage,

intergenerational trauma and the breakdown of traditional social control due to the imposition of structures and ideas of non-Aboriginal culture. For example, Atkinson (1994) and Robertson (2000) discuss that many Aboriginal people have had to suppress and/or deny their feelings of distress and despair. This distress has become internalised within the family, resulting in destructive behaviours, such as family violence, alcohol and drug abuse and suicide. According to Read (1999), the large-scale removal of indigenous children from their families is a major contributor to the experience of trauma. Cunneen and Libesman (2000), Robertson (2000), and Edwards and Madden (2001) reveal that there is an association between violence in indigenous Australians and their social disadvantages, such as lower incomes, higher rates of unemployment, poorer educational outcomes, lower rates of homeownership, homelessness and overcrowded living conditions. Robertson (2000) highlights the necessity of further research to enhance a detailed understanding of this association.

Violence has a direct impact on the health, safety, and wellbeing of individuals and communities, particularly for women and children. For many women, the psychological effects of violence are even more serious than its physical effects. The experience of abuse often erodes women's self-esteem and puts them at greater risk of a variety of mental health problems, such as depression, anxiety, phobia, post-traumatic stress disorder (Asadi et al. 2017; Tavoli et al. 2016).

In addition to the effects of violence on victims' physical, psychological, and sexual health, the effects of violence are also reflected in victims' subjective well-being (Poutiainen and Holma 2013). According to Friedman et al. (2010), subjective well-being implies the psychological well-being of a person and how satisfying a person believes his or her life is. In other words, subjective well-being is a person's assessment of the quality of life as a whole, measured in terms of an individual's personal perspective.

We have identified three distinctive gaps in the existing literature on the effects of violence on subjective well-being. Firstly, while there is a significant amount of literature available concerning the effects of violence on health and safety, the question of how violence affects subjective measures of well-being, such as those defined in terms of self-reported life satisfaction remains underexplored (Poutiainen and Holma 2013).

Secondly, little is known about the gender differences in effects of violence on self-perceived life satisfaction, as only a limited number of studies have investigated this matter (see, for example, Poutiainen and Holma 2013; Santos 2013). However, the current study differs from Poutiainen and Holma (2013) in two ways; (1) Poutiainen and Holma (2013) use qualitative data analysis techniques to investigate the gender aspect of violence and life satisfaction, whereas our study undertakes rigorous data analysis using advanced econometric techniques, such as heterogeneous choice model in combination with ordered logit model, (2) Poutiainen and Holma (2013) is based on a small sample ($n=61$) and the comparison between gender was done for even smaller subgroups. The authors have also noted this as a limitation of their study. Our study addresses this limitation by using a large sample ($n=6,823$). Our study also differs from another study by Santos (2013) in two ways; (1) Santos (2013) analyses gender difference in domestic violence on life satisfaction, while in this paper we analyse gender differences in domestic violence, as well as violence by any perpetrator on life satisfaction, (2) the gender comparison in Santos (2013) does not take into account the effects of unobserved heterogeneity in the samples of men and women models as the models have been estimated separately for men and women. The current study addresses this limitation by using a heterogeneous choice model approach that allows residual variability to differ by gender. More importantly, this paper discusses how these gendered effects vary between rich and poor men and women and between those who have household bargaining power because of the economic participation and those who do not have.

Thirdly, there is a dearth of literature available on the understanding of socio-economic and demographic drivers of life satisfaction among the indigenous Australians, indicating that the discussion of subjective well-being is largely missing from the indigenous policy domain. In recent years, there has been increasing interest among researchers on the well-being of indigenous Australians (Biddle 2014a; Biddle 2014b, Manning et al. 2016; Shields et al. 2009; Tomynt et al. 2013). However, none of these studies investigates how violence affects the life satisfaction of indigenous Australians and the potential gender differences in such effects. Given that violence is a critical social issue, particularly among the indigenous Australians, as Stiglitz et al. (2009) highlight, an in-depth examination of differences in the effects of violence on subjective well-being in a comprehensive manner across groups, such as men and women, will provide important insights for policy development and evaluations.

This study fills the gap in the existing literature by examining the gender differences in the link between physical violence victimisation and the life satisfaction of indigenous Australians. To the best of our knowledge, the current study represents the first attempt at analysing gender differences in the effects of violence using advanced econometric techniques, such as the heterogeneous choice model in conjunction with ordered logit approach. Hence, this paper makes a unique and significant contribution to the existing literature.

To this end, this study (1) investigates the factors that affect the likelihood of physical violence by any perpetrator and by a family member among indigenous Australians; (2) identifies how physical violence affects life satisfaction of indigenous Australians; and (3) examines how the effects of physical violence (by any perpetrator or by a family member) on life satisfaction differ across indigenous men and women in Australia. In doing so, this paper tests 3 hypothesis, namely H₁: women are more likely to experience violence than men, H₂: violence has a negative impact on life satisfaction, and H₃: violence reduces the life satisfaction

of women than that of men. Hereafter, in this study, ‘violence’ refers to physical violence and ‘family violence’ refers to physical violence by a family member -partner (current or previous), parent, or other family members.

This paper is organised as follows. Section 2 presents a review of literature. Section 3 describes the data used in this study. Section 4 presents the econometric model, estimated results and discussion relating to the factors affecting the likelihood of violence. Section 5 discusses the (gendered) impact of violence on life satisfaction. Section 6 briefly discusses the existing violence prevention policies and future directions. Section 7 discusses the limitations of the study and Section 8 presents concluding comments.

2. Review of Literature

2.1. Factors that affect the likelihood of violence

The existing literature has identified several demographic and socio-economic characteristics of victims of violence. These include (1) gender (2) age (3) marital status (4) substance use (5) alcohol use (6) homelessness (7) strength of community networks (8) employment status and (9) whether the person or a relative belongs to the stolen generation (see, for example, Bolger 1991; Bryant 2009; Rose et al. 2000; Snowball and Weatherburn 2008).

Gender and age have been widely accepted as important determinants of violence victimisation. In 2015-16, 5% of men and 4.5% of women aged 15 years and over had experienced assault or threatened assault in the previous 12 months in Australia (ABS 2017). Snowball and Weatherburn (2008) have reported a greater risk of victimisation among young people and the likelihood of victimisation to decrease with age. Concerning marital status, Felson and Cohen (1980) and Sampson (1987) found that single/divorced people face a higher

risk of stranger victimisation. This is because those who live alone are more likely to be out alone for various reasons than married persons and are, therefore, more vulnerable to violence from strangers.

Al-Yaman et al. (2006) and Snowball and Weatherburn (2008) found that alcohol and substance consumption of the victim is positively associated with violence victimisation among indigenous Australians. Homelessness has been identified as another important factor that causes violence victimisation in many societies. Jasinski (2010) and Murray (2011), for example, found that while both homeless men and homeless women are at a higher risk of being victims of violence, homeless women are more vulnerable to violence than homeless men. El-Bassel et al. (2001); Gondolf (1998); Rose et al. (2000) found that informal social networks play a critical role in promoting the safety and well-being of the survivors. The survivors, in fact, actively sought assistance from their informal social networks, even before seeking formal sources of assistance to help cope with or extricate themselves from the abuse. Employment status has also been recognised as an important factor that affects the likelihood of being a victim of violence among indigenous Australians. For example, ABS (2002) reported that unemployed indigenous Australians are more likely to be victims of violence compared to employed indigenous Australians.

Mow (1992) pointed out that violence among indigenous Australians cannot be seen in isolation from the context of colonisation, disadvantage, oppression, and marginalisation experienced by indigenous Australians. For many indigenous Australians, the experience of dispossession, cultural dislocation, and dislocation of families through removal have been identified as underlying factors that explain the extent of violence occurs in this population today (Cripps and McGlade 2008). The ABS (2006) reported that indigenous Australians who were removed from their family were almost twice as likely to be victims of violence.

2.2. Gender, violence and life satisfaction

There is a growing interest in subjective well-being as an important aspect of life and hence in social and economic policy design and evaluation (Kahneman and Sugden 2005; Layard 2006; Dolan and White 2007). Several studies have envisaged that life events have a significant impact on subjective well-being. While positive events tend to increase one's subjective well-being, negative events, such as violence victimisation seem to reduce subjective well-being (Lee and Browne 2008). Some studies have suggested that men and women have different perceptions towards the consequences of violence (Dobash and Dobash 2004). Furthermore, studies have found that the psychological impact of violence on women to be more severe than that of men (Saunders 2002). Nevertheless, the impact of violence on subjectively evaluated well-being of men and women remains underexplored in the literature (Poutiainen and Holma 2013). In analysing the cost of domestic violence, Santos (2013) noted that domestic violence does not significantly reduce men's life satisfaction. Poutiainen and Holma (2013) found that consequences of domestic violence have an adverse impact on an individual's subjective well-being. However, no significant gender differences were found in Poutiainen and Holma (2013). The authors further noted that these results have been drawn from a small sample size, hence must be interpreted with caution. Moreover, an emerging body of literature discusses the impact of violence on the decision-making process and economic participation of women who belong to poor societies/countries, which may in turn have substantial influence on overall subjective well-being (see, for example, Vyas, Mbwambo and Heise (2015) and Sen (1999)).

A detailed review of the literature, however, revealed that the gendered impact of violence from any perpetrator on subjective well-being is not examined in the literature. Using advanced econometric techniques, this paper provides novel insights towards the impact of

violence (by any perpetrator and by a family member) on subjectively evaluated well-being of men and women. Additionally, our study further discuss how these gendered effects vary between rich and poor and between those who have household bargaining power and those who do not have, using employment status as a proxy.

3. Data Description

The data used in this study is based on the National Aboriginal and Torres Strait Islander Social Survey (NATSISS) (2014/15) conducted by the ABS from September 2014 to June 2015 from a sample of 11,178 Aboriginal and Torres Strait Islander people living across Australia (ABS 2015). In this survey, the data relating to physical violence has been collected from a sub-sample of 6,823 persons aged 15 years and above. The estimates in this study have been derived using person weight to ensure that individual-level estimates conform to an independently estimated distribution of the population.

Columns 2 and 3 of Table 1 present the summary statistics relating to the full sample used in this study, while and columns 4 and 5 presents summary statistics relating to the victims of physical violence during the last 12 months by gender of the respondent. As can be seen, the mean age of men and women who have experienced violence is about 32 years. Statistics in columns 4 and 5 reveal that a higher proportion of victims of violence, both men (62.4%) and women (77.8%), are unmarried. 12.4% of men and 13.8% of women reported violence by any perpetrator. About 4.4% of men and 8.9% of women have experienced violence by a family member in the last 12 months.

[Table 1 about here]

Most of the respondents in the sample (60.8% men and 70.1% women) communicated with their family and friends every day. A large proportion of both men (92%) and women

(91.4%) in the sample could obtain community support at a time of crisis. The proportion of employed persons among those who experienced violence is 34.2% for men and 33.4% for women. Women who experienced violence demonstrated more than double homeless rates (19%) of the men (8.4%). More than 50% of men and women who experienced violence faced unfair treatments because of their indigenous status. Among the victims of violence, about 13% of men and 18.4% of women are members of the stolen generation (self or a relative).

Figure 1 shows the percentage of life satisfaction corresponding to the two groups; all respondents and physical violence victims.

[Figure 1 about here]

4. Modelling the likelihood of violence

In this section, we discuss the econometric model we propose to estimate the effects of socio-economic and demographic factors on the likelihood of violence, followed by the discussion of estimated results. The hypothesis we are testing here is H_1 : women are more likely to experience violence than men.

4.1. Logit Model: likelihood of violence

To model the likelihood of violence, we use the variables identified in the literature as independent variables against a binary dependent variable 'VIOLENCE' (Y) with two possible outcomes: 1 if the respondent experienced violence and 0 if the respondent did not experience violence in the past 12 months. To model such a dummy dependent variable, one of the commonly used techniques is to use the logit model.

As discussed in Camaron and Trivedi (2010), in binary models, the binary outcome variable, y , takes one of the two values:

$$y = \begin{cases} 1 & \text{with probability } p \\ 0 & \text{with probability } 1 - p \end{cases}$$

The probability mass function for the observed outcome, y , is $p^y(1-p)^{1-y}$, with $E(y) = p$ and $\text{Var}(y) = p(1-p)$.

A regression model is formed by parametrizing p to depend on an index function $X'\beta$, where X is a $K \times 1$ regressor vector and β is a column vector of K unknown parameters. In a standard binary outcome model, the conditional probability takes the form

$$(1) \quad p_i = \text{Pr}(y_i = 1|x_i) = F(x_i'\beta)$$

where $F(\cdot)$ is a specified parametric function of $X'\beta$, usually a cumulative distribution function (c.d.f.). The input can take any value from $-\infty$ to $+\infty$, whereas the output is confined to values between 0 and 1.

In the logit model, the probability p that $y = 1$ can be written as

$$(2) \quad p = \frac{\exp(X'\beta)}{1 + \exp(X'\beta)}$$

The marginal effect of an independent variable on p is given by

$$\frac{\partial p}{\partial x_i} = \beta_i * \frac{\exp(X'\beta)}{[1 + \exp(X'\beta)]^2} = \beta_i p(1-p)$$

The resulting logit model specification used for the analysis of this paper is as follows.

Model (1)

$$\begin{aligned} \text{logit}(\text{VIOLENCE}) &= \beta_0 + \beta_1 \text{GENDER} + \beta_2 \text{AGE} + \beta_3 \text{SMS} + \beta_4 \text{SUBS} + \beta_5 \text{RISKYALCOHOL} \\ &+ \beta_6 \text{REMOVED} + \beta_7 \text{REMOTE} + \beta_8 \text{NETWORK} + \beta_9 \text{EMP} + \beta_{10} \text{HMLESS} + \end{aligned}$$

where *VIOLENCE*: whether experienced violence in the last 12 months by any perpetrator (including violence by a family member) (yes=1, no=0), *GENDER*: gender of the respondent (woman=1, man=0), *AGE*: age of the respondent (years), *SMS*: social marital status (married=1, not-married=0), *SUBS*: whether used substance in last 12 months (yes=1, no=0), *RISKYALCOHOL*: risky alcohol consumption in 12-months 02/08 comparison using 2001 NHMRC long-term risk guide (drinks one day a year or less - no risk=0, low risk=1, medium risk=2 and high risk=3) where no risk is the base, *REMOVED*: whether self and/ or relatives ever removed from natural family (yes=1, no=0), *REMOTE*: living in a remote area based on ASGS 2011 categorisation (remote=1, non-remote=0), *NETWORK*: frequency of contact with family and friends outside household (no contact in last 3 months=0, once in three months=1, once a month=2, once a week=3, every day=4) where no contact is the base, *EMP*: labour force status (employed=1, unemployed=0), and *HMLESS*: whether ever experienced homelessness (yes=1, no=0).

To identify the factors affecting the likelihood of violence by a family member, we estimate a logit Model (2) with dummy dependent variable with two possible outcomes: 1 if the respondent experienced violence by a family member and 0 otherwise. The homelessness (*HMLESS*) variable that was included in Model (1) has not been included in Model (2) as it is not relevant when considering only violence by a family member. Instead, we include household size (*HHSIZE*) as an additional independent variable in Model (2). This is because, according to Bryant and Willis (2008) and Bryant (2009), the overcrowded household is an important factor that increases the risk of family violence among indigenous Australians.

Model (2):

$$\begin{aligned}
& \text{logit}(FAMVIOLENCE) \\
& = \beta_0 + \beta_1 FEMALE + \beta_2 AGE + \beta_3 SMS + \beta_4 SUBS + \beta_5 RISKYALCOHOL \\
& + \beta_6 REMOVED + \beta_7 REMOTE + \beta_8 NETWORK + \beta_9 EMP + \beta_{10} HHSIZE + \varepsilon
\end{aligned}$$

4.2. Estimation Results: likelihood of violence

Columns (2) and (3) of Table 2 present the coefficient estimates and the corresponding average marginal effects for Model (1), respectively, while columns (4) and (5) present the same for Model (2).

As can be seen, the coefficient estimates of the *GENDER* variable are positive (and statistically significant in the case of violence by a family member). This suggests that women are more likely to face violence than men, supporting our hypothesis H1. Marginal effects in column (3) reveal that indigenous women have 0.017 higher probability to face violence by any perpetrator compared to indigenous men and the corresponding column (5) results indicate that indigenous women have 0.051 higher probability (which is also statistically significant) than indigenous men to face violence by a family member. This observation is in line with the existing literature. For example, Ellsberg and Heise (2005) found that women are more likely to be physically assaulted by someone they know, often a family member or intimate partner than men.

The negative coefficients of the *AGE* variable in both cases suggest that the probability of violence declines with age. For example, as age increases, the likelihood of facing violence by any perpetrator and by a family member decreases by 0.002 and 0.001, respectively. Similar results have been found in (Snowball and Weatherburn 2008). The coefficient estimates and marginal effects for *SMS* is negative and statistically significant, suggesting that being married reduces the probability of violence victimisation. Similar results were found in Sampson (1987) and Felson and Cohen (1980).

The coefficients of *SUBS* and *RISKYALCOHOL* variables are positive and statistically significant in both models, suggesting that substance and alcohol use of the victim increases the probability of being a victim of violence. For example, substance consumption increases the probability of facing violence by any perpetrator by 0.069 and by a family member by 0.053. The estimated results on alcohol use reveal that the higher the risk of alcohol consumption, the greater the probability of being a victim of violence. For example, compared to indigenous Australians drinks one day a year or less, low-risk alcohol consumers face 0.036 higher probability, moderate-risk alcohol consumers face 0.071 higher probability and high-risk alcohol consumers face 0.123 higher probability of violence by any perpetrator. Similar results have been found in the literature. For example, Rees et al. (2011) found that women who had experienced gender-based violence had also experienced a substance use disorder over the lifetime. Bolger (1991) found similar results among Aboriginal Australians. Similar to the findings of Snowball and Weatherburn (2008), our results on *REMOVED* variable also reveal that being a member (or related to a member) of the stolen generation is associated with a significantly higher rate of violence victimisation both by any perpetrator (0.056) and by a family member (0.068).

Living in a remote area increases the probability of being a victim of violence by any perpetrator (statistically significant) and by a family member (not statistically significant). The coefficients of the *NETWORK* variable are negative and mostly statistically significant indicating that close social networks lower the probability of violence victimisation. This result is also in line with those found in the literature. For example, Trotter and Allen (2009) found that people, particularly women regard that social networks safeguard them from violence in the form of enhancing safety via direct and indirect interventions.

The employment status of the respondent reduces the probability of experiencing violence. Similar results have been found in the literature that there is a declining trend in physical violence among employed people (see, for example, Sambisa et al. 2011). The coefficient and marginal effects of the *HMLESS* variable are positive (and statistically significant) indicating that homelessness increases the probability of experiencing violence (by 0.092). Similar results were also reported in Jasinski (2010) and Murray (2011) that homeless people are at a higher risk of being victims of violence. Our results on household size indicate that larger household size increases the probability of violence by a family member. But as found in Snowball and Weatherburn (2008), this effect is not statistically significant.

[Table 2 about here]

5. Modelling the effects of violence on life satisfaction

In this section, we discuss the econometric model we propose to investigate the gender differences in the effects of violence on life satisfaction of indigenous Australians followed by the discussion of estimated results. The two hypotheses we are testing here is H₂: violence negatively impacts on life satisfaction and H₃: violence reduces the life satisfaction of women than that of men.

5.1. Ordered Logit Model: impact of violence on life satisfaction

To examine the impact of violence on overall life satisfaction, we use the variable ‘overall life satisfaction’ in the dataset, which assigns the value range 0 to 10 where 0 is for the least satisfied and 10 is for completely satisfied. The logit model can be extended to the ordered logit model when the choice is between more than two alternatives and these choices are inherently ordered. In ordered logit models, the ordered outcomes are modelled to arise sequentially as a latent variable, y^* , crosses progressively higher thresholds. In this study, y^* is an unobserved measure of overall life satisfaction. For an individual i , we specify

$$(3) \quad y_i^* = x_i' \beta + u_i$$

where a normalisation is that the regressors x_i 's do not include an intercept, because it would be exactly collinear with the threshold variables. For every low y^* (say $y^* < \alpha_1$), the overall life satisfaction (y_i) is 0; for $y^* > \alpha_1$, overall life satisfaction (y_i) improves to 1; for $y^* > \alpha_2$, it improves further to 2; and so on up to overall life satisfaction (y_i) reaches 10.

For an 11 -alternative ordered model, we define

$$(4) \quad y_i = j \quad \text{if } \alpha_j < y_i^* \leq \alpha_{j+1}, \quad j = 0, 1, \dots, 10$$

where $\alpha_0 = -\infty$ and $\alpha_{11} = \infty$. Then,

$$\begin{aligned} Pr(y_i = j) &= Pr(\alpha_j < y_i^* \leq \alpha_{j+1}) \\ &= Pr(\alpha_j < x_i' \beta + u_i \leq \alpha_{j+1}) \\ &= Pr(\alpha_j - x_i' \beta < u_i \leq \alpha_{j+1} - x_i' \beta) \\ &= F(\alpha_{j+1} - x_i' \beta) - F(\alpha_j - x_i' \beta) \end{aligned}$$

where F is the cumulative distribution function (c.d.f.) of u_i . The regression parameters β_j and the 10 threshold parameters, $\alpha_1, \dots, \alpha_{10}$, are obtained by maximising the log likelihood with $Pr(y_i = j)$ as defined above. The sign of the regressor parameters, β_j 's, can be interpreted as determining whether the latent variable, y^* , increases with the regressors. For example, if β_j is positive, then an increase in x_{ij} necessarily decreases the probability in the lowest category ($y_i = 0$) and increases the probability of being in the highest category ($y_i = 10$).

The ordered logit model we estimate to identify the effects of physical violence on the overall life satisfaction of indigenous people is specified as in Model (3) below.

Model (3)

$$\begin{aligned}
& \text{logit}(OLIFESAT^*) \\
& = \beta_0 + \beta_1 VOILENCE + \beta_2 FINSTRESS + \beta_3 SERACCPROBS + \beta_4 UNFTREAT \\
& + \beta_5 COMSUPPORT + \beta_6 HHINCOME + \varepsilon
\end{aligned}$$

where *OLIFESAT**: self-assessed life satisfaction - 0 (least satisfied) to 10 (highly satisfied), *VOILENCE*: whether experienced physical violence by any perpetrator in the last 12 months (yes=1, no=0), *FINSTRESS*: whether household members ran out of money for basic living expenses in the last 12 months (yes=1, no=0), *SERACCPROBS*: whether has problems accessing services, such as banking, health, financial, employment and family assistance services and other general services (yes=1, no=0), *UNFTREAT*: whether faced any unfair treatments, such as called names/ teased, heard racial comments or jokes, unfairly arrested or charged, left out or refused entry in last 12 months because Aboriginal and/or Torres Strait Islander (yes=1, no=0), *COMSUPPORT*: whether able to get support in time of crisis from outside household (yes=1, no=0) and *HHINCOME*: household gross weekly income.

In this study, we are particularly interested in comparing the differences in the effects of violence on life satisfaction for indigenous men and women. Traditionally, researchers estimate separate binary models for two or more groups to compare coefficients across groups (see, for example, Sekulic et al. 1994; Wright and Jacobs 1994; Santos 2013). Taking a similar approach, in this study, we also first estimate the ordered logit model (Model 3) for men and women, separately. In the actual estimation of Model (3), the violence variable is replaced by ‘physical violence by any perpetrator’ and ‘physical violence by a family member’ to estimate the effects of the respective types of violence on life satisfaction.

However, Allison (1999) alerts that there is a pitfall when comparing how the effects of variables (or coefficients) differ across groups – in this study, the effect of violence on life satisfaction for men and women – in binary models if the models have been estimated

separately for individual groups. This is because binary choice models are confounded with residual variation (unobserved heterogeneity). These differences in the degree of residual variation across groups can produce apparent differences in coefficients that are not indicative of true differences across groups. Allison (1999) proposes to fit a single model given by equation (5) for men and women that includes a new parameter which they called σ_i . The σ_i parameter adjusts the differences in residual variability between men and women. If we assume that the coefficients for men and women are constrained to be equal for the x variables, then the model can be written as

$$(5) \quad y_i = \alpha_0 + \alpha_1 G_i + \sum_{j>1} \alpha_j x_{ij} + \sigma_i \varepsilon_i$$

where G_i is a variable with a value of 1 for women and 0 for men ε_i has a standard logistic distribution and is independent of x . To make the disturbance variance differ by group, σ_i is defined as

$$(6) \quad \sigma_i = \frac{1}{1+\delta G_i}$$

with the $\delta > -1$, which is required for the variance to be positive. Equation (6) implies that $\sigma_m = 1$ for men and $\sigma_w = \frac{1}{1+\delta}$ for women.

If δ is positive, the disturbance variance $\sigma_w = \frac{1}{1+\delta} < 1 = \sigma_m$, meaning that the disturbance variance is smaller for women than men. If δ is negative, the disturbance variance larger for women than men since $\sigma_w = \frac{1}{1+\delta} > 1 = \sigma_m$. Using the fact that $\sigma_w = \frac{1}{1+\delta}$ and $\sigma_m = 1$, we can show that

$$100\delta = \frac{100(\sigma_m - \sigma_w)}{\sigma_m \sigma_w}$$

This means that 100δ can be interpreted as the percentage by which the disturbance standard deviation for men is greater or less than the standard deviation for women depending on whether δ is positive or negative. One other point worth noting is that specification (6) still allows the intercepts in (5) differ in the equations for men and women, even when the slopes are assumed to be the same.

Combining equations (5) and (6), an ordered logit model for men and women could be specified as

$$(7) \quad \log \left[\frac{p_i}{1-p_i} \right] = (\alpha_0^* + \alpha_1 G_i + \sum_{j>1} \alpha_j x_{ij})(1 + \delta G_i)$$

where $p_i = \Pr(y_i = j)$ and $\alpha_0^* = \alpha_0 - \mu$, where μ is the threshold value. After some algebraic manipulations, Allison (1999) derives

$$(8) \quad \log \left[\frac{p_i}{1-p_i} \right] = \alpha_0^* + (\alpha_1 + \alpha_0^* \delta + \alpha_1 \delta G_i) G_i + \sum_{j>1} \alpha_j x_{ij} + \sum_{j>1} \lambda_j (G_i * x_{ij})$$

If the coefficient of the interaction term ($\lambda_j = \alpha_j \delta$) is statistically significant, it means that the j^{th} interaction term ($G_i * x_{ij}$) significantly influences the dependent variable. The estimated coefficient, α_j associated with variable x_{ij} is the estimated effect of x_{ij} for men and $\alpha_j + \lambda_j$ is the estimated effect of x_{ij} variable for women.

Williams (2010) proposes a special case of heterogeneous choice model estimation as an alternative approach to Allison (1999). This approach allows residual variability to differ by groups (for example, by gender). The advantage of Williams' (2010) method is that it is particularly useful for ordinal dependent variables as in the case of the current study. In fact, ordinal variables are generally preferred in this method because they contain more information about the underlying latent variable. Following Williams' (2010) approach, we estimate a model similar to equation (8), taking the ordinal variable on life satisfaction as the dependent

variable to model the differences in the effect of violence on life satisfaction between indigenous men and women. The model can be written as follows.

Model (4)

$$OLIFESAT^* = \beta_0 + \beta_1 VIOLENCE + \beta_2 FINSTRESS + \beta_3 SERACCPROBS + \beta_4 UNFTREAT + \beta_5 COMSUPPORT + \beta_6 HHINCOME + \beta_7 GENDER + \beta_8 GENDER * VIOLENCE + \varepsilon$$

where $GENDER * VIOLENCE$: interaction term between women and violence. The estimated coefficient, β_1 associated with variable $VIOLENCE$ is the effect of violence on life satisfaction of men and $\beta_1 + \beta_8$ is the effect of violence on life satisfaction of women. If the coefficient of the interaction term (β_8) is statistically significant, it means that the effect of violence on life satisfaction is significantly different between men and women.

We estimate Model (4) for violence by any perpetrator and by a family member, separately to measure the difference in the effect of the types of violence on life satisfaction between men and women. The coefficient estimates of Models (3) and (4) and the corresponding average marginal effects are presented in Tables 3-4 and discussed in Section 5.2. It is important to note that as the value of the interaction term does not change independently of the value of the component terms (violence and women), we cannot estimate a separate effect for the interaction term. Hence, we do not present marginal effects for the interaction term. We only use the statistical significance of the interaction term coefficient to comment on whether there are any gender differences in the effects of violence on life satisfaction.

5.2. Estimation results: impact of violence on life satisfaction

Columns (2) to (4) of Table 3 presents the Model (3) results of violence by any perpetrator (for the full sample as well as for women and men, separately). Columns (5) to (7)

of Table 3 presents the same for violence by a family member. As can be seen, the coefficients of experience of violence (both violence by any perpetrator and by a family member), financial stress, problems in access to various services, the experience of unfair treatment variables are all negative and are statistically significant, except one. This indicates that these factors increase the probability of being in the lowest category of latent overall life satisfaction variable and decreases the probability of being in the highest category of the overall life satisfaction variable, in general, for both men and women. This result supports our hypothesis H2: violence has a negative impact on life satisfaction. Among the selected independent variables, financial stress generates the highest reduction in life satisfaction, followed by violence (except for the column 7 results). The coefficients attached to *COMSUPPORT* and *HHINCOME* variables are positive, indicating that strong community support and higher household incomes result in a greater score of life satisfaction.

As can be seen from column 3 in Table 3, the coefficient estimates corresponding to the *VOILENCE* (by any perpetrator) variable for women (-0.490) is larger in absolute value compared to that for men in (-0.256) in column 4. This indicates that the negative effect of violence on life satisfaction is larger for women than for men. The coefficients of violence (by a family member) variable for men and women (in columns (6) and (7)) indicate that family violence has a significantly higher negative effect on the life satisfaction of women (-0.474), while that of men is very small (-0.058) and not statistically significant. As a robustness test, the same models have been estimated using ordered probit approach and the results are found to be similar to those of the ordered logit model results.

[Table 3 about here]

Tables 4 presents the marginal effects corresponding to the ordered logit model results in columns (3) and (4) of Table 3. For example, for women (men) who have experienced

violence by any perpetrator, the likelihood of being in the lowest category of overall life satisfaction is 0.006 (0.002) higher, while the likelihood of being in the highest category of overall life satisfaction is 0.073 (0.035) lower than those who did not experience violence.

[Table 4 about here]

[Table 5 about here]

[Table 6 about here]

[Table 7 about here]

Table 5 presents a further disaggregation of life satisfaction outcomes of men and women due to violence by employment status. We have selected ‘employment status’ for further disaggregation due to two reasons; (a) employment status provides an indication on whether a particular individual is rich or poor and (b) whether a particular individual is economically independent and hence have bargaining power particularly within the household (Vyas, Mbwambo and Heise 2015). Our results indicate that the magnitude of the adverse impact of violence on life satisfaction is higher for unemployed women compared to employed women. While in general, there is no significant impact of family violence on the life satisfaction of men, violence by any perpetrator has a significant negative impact on the life satisfaction of unemployed men.

As discussed in Section 5.1, there may be differences in the degree of residual variation (unobserved heterogeneity) in the models estimated separately for men and women. To overcome this problem, following William (2010), we estimate Model (4), which allows residuals to differ by gender. The results are given in Table 6 and the corresponding marginal effects (excluding those of the interaction term and women variable) are given in Table 7. According to the heteroscedasticity corrected version (Model 4), $\beta_1 = -0.262$ is the estimated

effect of violence by any perpetrator on life satisfaction for men, and $\beta_1 + \beta_8 = (-0.262 + (-0.264)) = -0.526$ is the estimated effect of violence by any perpetrator on life satisfaction for women (see column 2 of Table 6). The results also suggest that the standard deviation of the residuals is $\exp(0.070) = 1.07$ times larger for women than men. These results confirm that physical violence by any perpetrator has a greater adverse impact on the life satisfaction of indigenous women than that of indigenous men.¹

Column (3) of Table 7 presents coefficient estimates of Model (4) where violence is committed by a family member. The results indicate that $\beta_1 = 0.046$ is the estimated effect of family violence on life satisfaction for men. But this effect is not statistically significant. $\beta_1 + \beta_8 = (0.046 + (-0.555)) = -0.509$ is the estimated effect of family violence on life satisfaction for women. The adverse effect is considerably large and statistically significant for women. Overall, the results of both models indicate that violence (by any perpetrator or by a family member) significantly reduces the life satisfaction of indigenous women than that of indigenous men, supporting our hypothesis H₃. Similar results have been found in the literature. Santos (2013) indicates that men and women use different sets of information to assess their satisfaction with life as a whole, and as a result, violence by a family member may not significantly decrease men's life satisfaction as it does for women.

6. Violence prevention policies and future directions

A significant number of interventions and programs have been implemented in Australia to prevent violence, particularly violence against women and children. These programs have been implemented at the national level, state and territory level and specific community level. Some of the initiatives that are especially implemented for indigenous

¹ None of the interaction between any other variable and gender dummy other than the interaction between violence and gender dummy was statistically significant.

Australians include Stronger Futures Policy, The Aboriginal Family and Community Healing Program, The Cross Borders Indigenous Family Violence and Aboriginal Women Against Violence Project. Some programs provide support to victims of violence in the form of counselling, legal aid, or protection. Other programs target the perpetrators of violence, such as offender rehabilitation, community policing, justice or behavioural reform, or safe house programs (Closing the Gap Clearinghouse (AIHW & AIFS) 2016). In addition to these interventions, there are some important laws, regulations and licensing in place to prevent family violence and other forms of violence.²

In general, based on our estimation results, the above programs appear to be an effective and appropriate method to break barriers to education about violence and mainstream support services and have strengthened the determination of indigenous Australians to address violence in their communities. Despite these programs, violence continues to remain as a major social and welfare policy concern. This is partly because these programs lack of integration and coordination in service delivery, operate with a lack of cultural awareness and apply a simplistic approach to policy development to deal with deep-rooted issues. Practitioners have identified a number of practice principles that are important for the successful implementation of violence prevention interventions among indigenous Australians. These include community involvement and engagement in violence prevention programs, consideration of cultural factors when implementing programs and adoption of holistic and flexible approach in designing and implementing these programs (Day and Fernandez 2015, Closing the Gap Clearinghouse 2016).

The adverse impact of violence on overall life satisfaction of indigenous Australians, especially that of women found in this study further highlights the need of affirmative actions

² For more details, please refer to The National Council to Reduce Violence against Women and their Children (2009). Domestic Violence Laws in Australia. Canberra, Commonwealth of Australia.

on policies and programs directed towards enhancing public education about violence, early intervention for young adults at risk, strengthening legal and policing responses addressing trauma in specific situations, addressing community inequality and disadvantage, reducing early and heavy youth alcohol use, and nurturing social and cultural capital in indigenous communities to create behavioural change of people towards a violence-free society.

7. Limitations of the study

The analysis of this paper is subjected to four main limitations. Firstly, the NATSIS provides data on respondent's experience of physical violence. Therefore, the findings of this study are limited to physical violence and its impact on overall life satisfaction. Secondly, the NATSIS excludes the homeless and those who are in hospitals and prisons at the time of surveys are conducted. Thirdly, the NATSIS data on marital status identifies whether the respondent is married or not. Other complexities associated with marital status, such as divorced or separated, are, therefore, not incorporated in the analysis of this study. However, NATSIS has the advantage of a much larger sample size of indigenous people compared to any other survey. Fourthly, while we acknowledge that there could be a possibility of having a causal relationship running from life satisfaction to violence, particularly committing violence, in this paper, we assume the direction of causality running from violence victimisation to life satisfaction.

8. Concluding comments

This study investigated the factors that affect the prevalence of physical violence and family violence and the gender differences in effects of violence (physical violence by any perpetrator and by a family member) on the life satisfaction of indigenous Australians. Our results revealed that there is a higher probability for indigenous women to experience violence (by any perpetrator and by a family member) than indigenous men. While younger age,

remoteness, removal from the family, homelessness, alcohol and substance consumption increase the likelihood of victimisation of violence, strong community networks, and married status reduce the likelihood of victimisation of violence. Our results also revealed that strong community networks and high incomes enhance the life satisfaction of indigenous Australians, while experience of violence, financial stress, problems in access to various services, and experience of unfair treatment negatively affect life satisfaction. We also observed significant gender differences in the effects of violence on life satisfaction, where we find that women experience a greater reduction in life satisfaction due to violence than men. In summary, our results support the three hypotheses, namely H₁: women are more likely to experience violence than men, H₂: violence has a negative impact on life satisfaction, and H₃: violence reduces the life satisfaction of women than that of men. Our findings imply that violence creates a significantly pervasive impact on life satisfaction of women and therefore, suggest affirmative actions on policies and programs directed towards the prevention of violence.

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Table 1: Summary statistics of the sample by gender

Characteristic (1)	All respondents		Physical violence victims	
	Men (2)	Women (3)	Men (4)	Women (5)
Average Age (yrs)	35.5	36.24	31.6	32.2
Average Number of household members	3.7	3.8	3.8	3.9
Social marital status (%)				
Married	45.5	39.3	37.6	22.2
Unmarried	54.5	60.7	62.4	77.8
Remote (%)	22.1	22.4	27.4	21.0
Faced violence by any perpetrator within the last 12 months (%)	12.4	13.8	-	-
Faced violence by family member within the last 12 months (%)	4.4	8.9	35.4	65.0
Risky alcohol consumption (%)				
Drinks one day a year or less	30.7	48.2	25.2	35.8
Low risk	57.3	43.6	57.4	45.8
Medium risk	5.8	4.5	7.2	7.2
High risk	6.2	3.6	10.1	11.1
Substance use (%)	30.5	25.1	48.4	46.8
Frequency of communication with family and friends (%)				
No contact	1.8	1.0	4.0	1.0
Once in three months	1.0	0.5	0.5	0.3
Once a month	4.3	2.5	3.5	2.5
Once a week	32.3	25.5	24.9	24.5
Every day	60.8	70.1	67.1	71.7
Have community support in a crisis (%)	92.0	91.4	90.0	86.4
Employed (%)	50.9	40.4	34.2	33.4
Experienced homelessness (%)	4.4	8.1	8.4	19.0
Experienced unfair treatment (%)	31.2	34.9	55.3	54.4
Person or relative of the stolen generation (%)	8.2	10.9	12.9	18.4
Experienced financial stress (%)	26.6	28.9	43.1	42.1

Source: ABS (2015)

Table 2: Logit model estimation results: Factors affecting violence victimisation

Variable	<i>Model (1)</i>		<i>Model (2)</i>	
	Violence by any perpetrator		Violence by family member	
	Coefficient estimate	Marginal effect	Coefficient estimate	Marginal effect
(1)	(2)	(3)	(4)	(5)
Constant	-1.094*		-2.800*	
	(0.028)		(0.000)	
Gender (woman=1)	0.166	0.017	0.853*	0.051**
	(0.182)	(0.182)	(0.000)	(0.000)
Age	-0.020*	-0.002*	-0.007*	-0.001
	(0.000)	(0.000)	(0.019)	(0.194)
Social marital status (married=1)	-0.472*	-0.049*	-0.542*	-0.032*
	(0.000)	(0.000)	(0.002)	(0.002)
Substance use (yes=1)	0.672*	0.069*	0.886*	0.053*
	(0.000)	(0.000)	(0.000)	(0.000)
Risky alcohol consumption				
No risk vs. low risk	0.366*	0.036*	0.570*	0.032*
	(0.017)	(0.014)	(0.002)	(0.001)
No risk vs. moderate risk	0.656*	0.071*	0.568**	0.031**
	(0.010)	(0.021)	(0.050)	(0.098)
No risk vs. high risk	1.021*	0.123*	1.067*	0.073*
	(0.000)	(0.000)	(0.000)	(0.001)
Person or family member of stolen generation (Base=No)				
Yes	0.481*	0.056*	0.892*	0.068*
	(0.007)	(0.015)	(0.000)	(0.000)
Refusal	0.117	0.012	0.718**	0.051
	(0.713)	(0.722)	(0.060)	(0.140)
Remote (yes=1)	0.339*	0.035*	0.250	0.015
	(0.004)	(0.003)	(0.116)	(0.104)
Social network (Base: No contact)				
Once in 3 months	-1.383**	-0.159**	-3.263*	-0.130**
	(0.073)	(0.063)	(0.008)	(0.059)
Once a month	-0.884**	-0.116	-0.831	-0.068
	(0.097)	(0.138)	(0.272)	(0.345)
Once a week	-0.955*	-0.123**	-1.084**	-0.082
	(0.039)	(0.094)	(0.096)	(0.232)
Every day	-0.826**	-0.110	-0.77	-0.065
	(0.071)	(0.134)	(0.232)	(0.346)
Employed (yes=1)	-0.423*	-0.044*	-0.261	-0.016
	(0.002)	(0.002)	(0.109)	(0.108)
Experienced homelessness (yes=1)	0.893*	0.092*		
	(0.000)	(0.000)		
Overcrowded household			0.031	0.002
			(0.467)	(0.472)
Number of observations	6823		6823	

Note: *statistically significant at the 5% level**statistically significant at the 10% level. P-values are in parentheses.

Table 3: Ordered logit Model (3) estimations: Impact of violence on life satisfaction

Variable	Violence by any perpetrator			Violence by family member		
	Both men and women	Women	Men	Both men and women	Women	Men
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Violence (yes=1)	-0.392* (0.000)	-0.490* (0.000)	-0.256* (0.000)	-0.306* (0.001)	-0.474* (0.000)	-0.058 (0.730)
Financial stress (yes=1)	-0.637* (0.000)	-0.582* (0.000)	-0.717* (0.000)	-0.655* (0.000)	-0.594* (0.000)	-0.744* (0.000)
Problems in accessing services (yes=1)	-0.300* (0.000)	-0.360* (0.000)	-0.200* (0.006)	-0.309* (0.000)	-0.371* (0.000)	-0.204* (0.020)
Unfair treatment (yes=1)	-0.303* (0.000)	-0.290* (0.000)	-0.322* (0.000)	-0.330* (0.000)	-0.314* (0.000)	-0.353* (0.000)
Ability to access community support (yes=1)	0.423* (0.000)	0.413* (0.000)	0.431* (0.000)	0.427* (0.000)	0.411* (0.001)	0.442* (0.000)
Household income (log of)	0.234* (0.000)	0.224* (0.000)	0.251* (0.000)	0.240* (0.000)	0.231* (0.000)	0.257* (0.000)
Number of observations	5407	3112	2295	5407	3112	2295

Note: *statistically significant at the 5% level. *p*-values are in parentheses.

Table 4: Marginal effects: Impact of physical violence by any perpetrator on life satisfaction

Overall Life satisfaction	Women						Men					
	Violence (yes=1)	Financial stress (yes=1)	Problems in accessing services (yes=1)	Unfair treatments (yes=1)	Access to community support (yes=1)	Log of household income	Violence (yes=1)	Financial stress (yes=1)	Problems in accessing services (yes=1)	Unfair treatments (yes=1)	Access to community support (yes=1)	Log of household income
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
0	0.006 (0.000)	0.007 (0.000)	0.004 (0.000)	0.003 (0.001)	-0.005 (0.003)	-0.003 (0.000)	0.002 (0.043)	0.005 (0.000)	0.001 (0.045)	0.002 (0.004)	-0.003 (0.010)	-0.002 (0.001)
1	0.004 (0.000)	0.005 (0.000)	0.003 (0.000)	0.002 (0.001)	-0.003 (0.005)	-0.002 (0.000)	0.002 (0.045)	0.005 (0.000)	0.001 (0.047)	0.002 (0.005)	-0.003 (0.011)	-0.002 (0.002)
2	0.005 (0.000)	0.006 (0.000)	0.004 (0.000)	0.003 (0.001)	-0.005 (0.003)	-0.003 (0.000)	0.003 (0.033)	0.009 (0.000)	0.002 (0.035)	0.004 (0.001)	-0.005 (0.005)	-0.003 (0.000)
3	0.010 (0.000)	0.012 (0.000)	0.007 (0.000)	0.006 (0.000)	-0.008 (0.002)	-0.005 (0.000)	0.005 (0.027)	0.014 (0.000)	0.004 (0.029)	0.006 (0.000)	-0.008 (0.003)	-0.005 (0.000)
4	0.016 (0.000)	0.019 (0.000)	0.012 (0.000)	0.010 (0.000)	-0.014 (0.001)	-0.007 (0.000)	0.009 (0.024)	0.024 (0.000)	0.007 (0.026)	0.011 (0.000)	-0.015 (0.002)	-0.008 (0.000)
5	0.041 (0.000)	0.049 (0.000)	0.030 (0.000)	0.024 (0.000)	-0.035 (0.001)	-0.019 (0.000)	0.019 (0.021)	0.053 (0.000)	0.015 (0.023)	0.023 (0.000)	-0.032 (0.001)	-0.019 (0.000)
6	0.018 (0.000)	0.021 (0.000)	0.013 (0.000)	0.010 (0.000)	-0.015 (0.001)	-0.009 (0.000)	0.012 (0.021)	0.033 (0.000)	0.009 (0.023)	0.015 (0.000)	-0.020 (0.001)	-0.010 (0.000)
7	0.015 (0.000)	0.018 (0.000)	0.011 (0.000)	0.009 (0.000)	-0.013 (0.001)	-0.007 (0.000)	0.009 (0.023)	0.025 (0.000)	0.007 (0.024)	0.011 (0.000)	-0.015 (0.002)	-0.008 (0.000)
8	-0.016 (0.000)	-0.019 (0.000)	-0.012 (0.000)	-0.010 (0.000)	0.014 (0.001)	0.007 (0.000)	-0.009 (0.023)	-0.027 (0.000)	-0.007 (0.026)	-0.012 (0.000)	0.016 (0.002)	0.008 (0.000)
9	-0.026 (0.000)	-0.031 (0.000)	-0.019 (0.000)	-0.015 (0.000)	0.022 (0.001)	0.012 (0.000)	-0.014 (0.021)	-0.041 (0.000)	-0.012 (0.023)	-0.019 (0.000)	0.024 (0.001)	0.013 (0.000)
10	-0.073 (0.000)	-0.087 (0.000)	-0.054 (0.000)	-0.043 (0.000)	0.062 (0.001)	0.034 (0.000)	-0.035 (0.021)	-0.100 (0.000)	-0.028 (0.023)	-0.045 (0.000)	0.060 (0.001)	0.035 (0.000)

Note: Marginal effects corresponding to ordered logit model results given in Columns (3) and (4) in Table 3 is given here.

Table 5: Ordered logit Model (3) estimations: Impact of violence on life satisfaction by employment status

Variable	Violence by any perpetrator				Violence by family member			
	Employed		Unemployed		Employed		Unemployed	
	Women	Men	Women	Men	Women	Men	Women	Men
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Violence (yes=1)	-0.398*	0.152	-0.494*	-0.393*	-0.317	0.058	-0.508*	0.026
	(0.030)	(0.931)	(0.000)	(0.006)	(0.157)	(0.815)	(0.000)	(0.730)
Financial stress (yes=1)	-0.628*	-0.792*	-0.532*	-0.615*	-0.634*	-0.793*	-0.546*	-0.663*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Problems in accessing services (yes=1)	-0.038*	-0.080	-0.357*	-0.307*	-0.381*	-0.079	-0.373*	-0.293*
	(0.002)	(0.544)	(0.000)	(0.010)	(0.002)	(0.545)	(0.000)	(0.013)
Unfair treatment (yes=1)	-0.235*	-0.382*	-0.340*	-0.288*	-0.245*	-0.384*	-0.374*	-0.349*
	(0.032)	(0.001)	(0.000)	(0.013)	(0.026)	(0.001)	(0.000)	(0.002)
Ability to access community support (yes=1)	0.038	0.553*	0.510*	0.320*	0.037	0.555*	0.506*	0.337*
	(0.876)	(0.013)	(0.000)	(0.049)	(0.877)	(0.013)	(0.001)	(0.038)
Household income (log of)	0.027	0.197*	0.223*	0.122	0.035	0.197*	0.227*	0.128**
	(0.760)	(0.033)	(0.000)	(0.104)	(0.686)	(0.032)	(0.000)	(0.088)
Number of observations	1,196	1,105	1916	1190	1,196	1,105	1916	1,190

Note: *statistically significant at the 5% level**statistically significant at the 10% level. P-values are in parentheses.

Table 6: Ordered logit Model (4) results adjusted for heterogeneity across gender

Variable	Violence by any perpetrator	Violence by family member
(1)	(2)	(3)
Violence (yes=1)	-0.262* (0.016)	0.046 (0.779)
Financial stress (yes=1)	-0.666* (0.000)	-0.685* (0.000)
Problems in accessing services (yes=1)	-0.305* (0.000)	-0.313* (0.000)
Unfair treatment (yes=1)	-0.316* (0.000)	-0.344* (0.000)
Ability to access community support (yes=1)	0.440* (0.000)	0.445* (0.000)
Household income (log of)	0.245* (0.000)	0.252* (0.000)
Gender (woman=1)	0.056 (0.295)	0.071 (0.168)
Gender*Violence	-0.264** (0.076)	-0.555* (0.007)
Ln(sigma)		
Gender	0.070* (0.007)	0.068* (0.006)
Number of observations	5407	5407

Note: *statistically significant at the 5% level. p-values are in parentheses.

Table 7: Marginal effects: Impact of violence on life satisfaction

Overall Life satisfaction	Violence by any perpetrator						Violence by a family member					
	Violence (yes=1)	Financial stress (yes=1)	Problems in accessing services (yes=1)	Unfair treatments (yes=1)	Access to community support (yes=1)	Log of household income	Violence (yes=1)	Financial stress (yes=1)	Problems in accessing services (yes=1)	Unfair treatments (yes=1)	Access to community support (yes=1)	Log of household income
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
0	0.002 (0.022)	0.006 (0.000)	0.003 (0.001)	0.003 (0.001)	-0.004 (0.001)	-0.002 (0.001)	-0.000 (0.779)	0.006 (0.000)	0.003 (0.013)	0.003 (0.002)	-0.004 (0.000)	-0.002 (0.001)
1	0.002 (0.024)	0.005 (0.000)	0.002 (0.001)	0.002 (0.001)	-0.003 (0.002)	-0.002 (0.002)	-0.000 (0.779)	0.005 (0.000)	0.002 (0.017)	0.002 (0.004)	-0.003 (0.000)	-0.002 (0.001)
2	0.003 (0.021)	0.007 (0.000)	0.003 (0.001)	0.003 (0.001)	-0.005 (0.001)	-0.003 (0.001)	-0.001 (0.779)	0.008 (0.000)	0.004 (0.012)	0.004 (0.002)	-0.005 (0.000)	-0.003 (0.000)
3	0.005 (0.019)	0.013 (0.000)	0.006 (0.000)	0.006 (0.000)	-0.008 (0.000)	-0.005 (0.000)	-0.001 (0.779)	0.013 (0.000)	0.006 (0.008)	0.007 (0.002)	-0.009 (0.000)	-0.005 (0.000)
4	0.008 (0.017)	0.021 (0.000)	0.010 (0.000)	0.010 (0.000)	-0.014 (0.000)	-0.008 (0.000)	-0.002 (0.779)	0.022 (0.000)	0.010 (0.007)	0.010 (0.001)	-0.014 (0.000)	-0.009 (0.000)
5	0.020 (0.016)	0.051 (0.000)	0.023 (0.000)	0.024 (0.000)	-0.034 (0.000)	-0.019 (0.000)	-0.004 (0.779)	0.053 (0.000)	0.024 (0.006)	0.027 (0.000)	-0.034 (0.000)	-0.019 (0.000)
6	0.010 (0.017)	0.026 (0.000)	0.012 (0.000)	0.012 (0.000)	-0.017 (0.000)	-0.010 (0.000)	-0.002 (0.779)	0.027 (0.000)	0.012 (0.007)	0.013 (0.000)	-0.017 (0.000)	-0.012 (0.000)
7	0.008 (0.017)	0.021 (0.000)	0.010 (0.000)	0.010 (0.000)	-0.014 (0.000)	-0.008 (0.000)	-0.001 (0.779)	0.022 (0.000)	0.010 (0.006)	0.011 (0.001)	-0.014 (0.000)	-0.009 (0.000)
8	-0.009 (0.017)	-0.022 (0.000)	-0.010 (0.000)	-0.011 (0.000)	0.015 (0.000)	0.008 (0.000)	0.002 (0.779)	-0.023 (0.000)	-0.011 (0.008)	-0.012 (0.001)	0.015 (0.000)	0.010 (0.000)
9	-0.014 (0.016)	-0.035 (0.000)	-0.016 (0.000)	-0.017 (0.000)	0.023 (0.000)	0.013 (0.000)	0.002 (0.779)	-0.036 (0.000)	-0.016 (0.006)	-0.018 (0.000)	0.023 (0.000)	0.015 (0.000)
10	-0.037 (0.016)	-0.092 (0.000)	-0.043 (0.000)	-0.044 (0.000)	0.062 (0.000)	0.034 (0.000)	0.007 (0.779)	-0.096 (0.000)	-0.043 (0.006)	-0.048 (0.000)	0.062 (0.000)	0.036 (0.000)

Note: *p*-values are in parentheses. Marginal effects corresponding to ordered logit model results given in Table 6, excluding those of the interaction term and women variable are given here.

Figure 1

