

Does Domestic Violence Decrease as Women Age? Understanding the Patterns of Domestic Violence in India

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ABSTRACT

In India, rates of domestic violence (DV) are extremely high. Wilson and Daly (1993) propose that DV varies according to a woman's reproductive value and a woman's risk of being a victim of DV declines steeply as they age. Here, we investigate the associations between demographic factors (age, residence type, and education level of women) and DV (occurrences of physical violence and trends in sexual violence, two common forms of DV) among women in India using publicly available data collected across four waves from the National Family Health Survey (NFHS), spanning 1998-2021. Analyses revealed that while physical violence decreased with women's age in the NFHS-2 (1998-99) and NFHS-3 (2005-06) waves, physical violence rates in older women instead increased in the later waves of data collection. Additionally, women living in rural areas experienced higher rates of physical violence compared to those living in urban areas, and less educated women experienced higher rates of physical violence compared to highly educated women. We discuss various economic (unemployment), cognitive (awareness of rights, intergenerational transfer of values), social (increased education level, migration), and evolutionary (income inequality, mate value discrepancies) explanations to understand these trends in the prevalence of DV among older women in India. Finally, we discuss the implications for the implementation of interventions targeted towards survivors of DV in India.

KEYWORDS

Domestic Violence, Demographic Factors, Violence Against Women, Physical Violence, Sexual Violence, Secondary Data

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INTRODUCTION

Thirty percent of women worldwide have been a victim of domestic violence (DV), which includes a striking 736 million women around the world (World Bank, 2022). DV refers to abuse or violence perpetrated by either or both individuals in a relationship that can have major negative consequences. This abusive behaviour can include physical, emotional/psychological, sexual, and economic violence (Jansen, 2016). Although DV can also be perpetrated by family members, such as in-laws and parents, it is most commonly perpetrated by those in a relationship. While DV can be bidirectional, male-to-female violence has a much higher prevalence rate compared to female-to-male violence and often has more severe consequences for victims who are women compared to victims who are men (Swan et al., 2008). According to data from the Office for National Statistics (England and Wales), one in four women is likely to be a victim of domestic abuse in their lifetime as compared to one in six to seven men (ManKind Initiative, 2023). Further, a report from the United Nations finds that nearly one in three women have been exposed to physical or sexual violence by intimate partners at least once in their lifetime (UN Women, 2023). Being exposed to DV can lead to both physical and psychological damage to an individual, including depression, post-traumatic stress disorder (PTSD), anxiety disorders, physical injuries, chronic pain, gynaecological problems, and in severe instances, death (Campbell, 2002; Levendosky et al., 2012).

Past research has demonstrated that among the many factors influencing one's risk of experiencing DV, younger women were at a greater risk of experiencing DV compared to older women (Wilson & Daly, 1993). The researchers hypothesized that younger women are at a greater risk of being victims of DV as compared to older women because they have a higher reproductive value than older women, who have a lower reproductive value (Wilson & Daily, 1993). In other words, the researchers hypothesized that as a woman's age increases, their chances of being a victim of DV decreases. While there has been support for this hypothesis within WEIRD (i.e., Western, Educated, Industrialized, Rich, and Democratic) populations (e.g., United States; Peters et al., 2002), to the authors' knowledge, there is no study that has investigated associations between age and occurrences of DV within non-WEIRD populations, in countries where rates of DV, along with factors associated with DV rates (e.g., income inequality, gender imbalance), are extremely high (Ghoshal et al., 2022). The lifetime intimate partner violence prevalence rate, which is a sub-form of DV, is the highest in the WHO South-East Asia Region and the WHO African region at 33%, compared to 22-25% in the WHO regions of the Americas and high-income countries (World Health Organization, 2021). As such, understanding the factors that influence rates of DV within cultures experiencing the highest rates of DV has the potential to have a large impact on policy and intervention strategies within these under-researched populations.

To address this gap, the following study investigated associations between demographic factors (primarily age, but also residence type and education level of women) and occurrences of physical violence and sexual violence among women in India, where the rates of DV are extremely high (Perappadan, 2019). For the purpose of our study, we assess reported physical violence and explore trends in sexual violence, using these factors together to estimate trends in the rates of DV in India.

Based on evolutionary theory and past research (Peters et al., 2002; Wilson & Daly, 1993) we expected that rates of DV would decrease in our sample as women's age increased. We further explored the impact of living in a rural vs. an urban environment and women's education levels on rates of DV in women in India. We utilized publicly available data from the four waves of the National Family Health Survey (NFHS 2: 1998-99, NFHS 3: 2005-06, NFHS 4: 2015-16, NFHS 5: 2019-21) to examine how both physical and sexual violence, vary based on women's age, residence type, and education level. Beyond exploring evolutionary explanations for the patterns of results we observed, we also discuss potential economic, cognitive, and social explanations for the trends that emerged.

Evolutionary Insights into Mating and Conflict Between the Sexes

Due, in part, to the sex differences in DV roles, with men more often being the perpetrator and women the victim of DV (D'Costa & Saklofske, 2022), understanding DV from an evolutionary perspective provides valuable insights into the causes and consequences of DV. Heterosexual, monogamous, pair-bonded mating has both costs and benefits for both individuals in a relationship. The benefits of these relationships include protection from ailments, increased reproductive success, and improved offspring survival (Buss, 2012). However, mating also comes with costs, with sex differences in these potential costs influencing the sex-differentiated threats to relationships and the strategies employed to overcome them. Below, we provide examples of some of the adaptive problems inherent to mating which cause conflict between the sexes.

Females Limit Male Reproductive Potential and Access to Novel Partners

Female biology limits the maximum number of offspring a woman can produce across her lifespan, with constraints on both the time period during which a woman is reproductively capable (puberty to menopause) and the rate at which she can produce offspring (about one offspring per year, typically). Human males, however, are able to reproduce from puberty until the end of their lives, with no limit to the number of offspring they could theoretically sire within a given timespan. As such, within the context of a heterosexual, monogamous, pair-bonded relationship, the woman limits the man's reproductive potential to that of her own (Bateman, 1948). Further, due to this discrepancy between the reproductive potential of men and women, men are found to have a higher desire for novel sexual partners than women (Jokela et al., 2010), as accessing novel sexual partners stands to increase men's reproductive success to a far greater degree than women's, who cannot conceive a child during the time in which she is pregnant. These discrepancies give rise to conflict between the sexes within relationships. To maintain the relationship, men pay costs in both their potential fitness and in their access to novel sexual partners. While women must forgo potential benefits (i.e., protection, resource access) she could receive from other males to maintain this relationship, evolutionarily, monogamous mating has the potential to pose larger fitness costs to men than to women. Following this, males have strong incentives to protect their relationships from potential threats.

Threats of Sexual Infidelity, Paternal Uncertainty, and Cuckoldry. From an evolutionary perspective, sexual infidelity is a larger threat for males than for females, as females are always certain that any offspring she produces is, in fact, hers. For men, however, there is no way to be certain that any offspring produced by their partner is theirs (Buss, 2004). As such, males risk inadvertently investing in a rival's offspring, investing resources in the rival's child as opposed to their own, thus contributing to their rival's overall fitness at a cost to their own if their partner commits sexual infidelity.

Mate Poaching. Mate poaching is a form of infidelity where an individual pursues a partnered romantic target with the aim of getting into a romantic or sexual relationship, which can be short- or long-term. This poses a threat to the partner of the target, as available mating resources (love, warmth, financial resources, protection, etc.) could be redirected to the mate poacher. There are sex differences in how and when men and women feel threatened by mate poachers, with men feeling insecure by potential mate poachers who have better financial resources, physical strength, and jobs than them (Buss et al., 2000), and women feeling threatened by those who might be more attractive than them (Buss & Duntley, 2011).

Resource Provisioning and Scarcity

The provision of resources by males to females, especially when pregnant or breastfeeding, has been an important aspect of the mating relationship throughout our evolutionary history (Buss & Duntley, 2011). Loss of access to resources, diversion of these resources, events that threaten the loss of those resources, and loss of benefits that come with both tangible and intangible resources in a relationship can cause relationship conflicts, whether due to economic hardship or infidelity (Buss & Duntley, 2011). Economic hardships, poverty, and income inequality may lead to female infidelity when women seek resources outside her relationship. However, conflict can also arise due to the psychological stress experienced by males when they are not able to provide sufficient resources, and may fear infidelity, even when it is not realistically suspected.

Mate Value Discrepancies

Mate value comprises one's self-perceived desirability and relative standing in the mating market for a potential romantic partner (Travers, 2019), and is a strong predictor of satisfaction in a relationship (Babaeizad, 2022). In their research, Buss and Duntley (2011) explain how mate value discrepancies can arise due to errors of selection through deceiving about false resource-holding potential, children from previous relationships, and aggressive or unstable personality dispositions. During the course of one's relationship, mate value discrepancies may also arise over time due to career growth, disease, and injury. Mate value discrepancies may lead to conflict, especially when a female has or gains a higher mate value than her male partner, which can cause a male to feel the relationship is in danger.

Adaptive Solutions: Romantic Jealousy and Domestic Violence

In the face of reoccurring threats to romantic relationships and adaptive problems stemming from conflict between the sexes, humans have evolved strategies to deter potential threats and promote the maintenance of their relationships, including the emotion of romantic jealousy. Romantic jealousy, arising from real or imagined threats to a romantic relationship or one's self-esteem, involves complex behaviours, thoughts, and feelings (White, 1981). An actual threat is not a prerequisite for the experience of romantic jealousy, often suspiciousness, insecurity, anxiety, and a lack of affection are sufficient to induce feelings of jealousy (Peretti & Pudowski, 1997). While colloquially, jealousy is associated with negative connotations, from an evolutionary viewpoint, its function is to motivate behaviours and cognitions that protect and safeguard important relationships in one's life (Yong & Li, 2018), often promoting mate retention behaviours (Degiuli et al., 2023; Nelson, 2014). Although both men and women express romantic jealousy, men have been found to express more jealousy when it is prompted by sexual infidelity and women have been found to express more jealousy when it is prompted by emotional infidelity (Larsen et al., 2017; Davis et al., 2018; Buss et al., 2013). However, despite its adaptive function, romantic jealousy, when triggered, can lead to mate retention and mate-guarding behaviours, with one of the major mate retention tactics being the use of violence towards a partner or rival. Thus, romantic jealousy can motivate violence, which may be used as a strategy to protect one's relationship from actual or perceived potential threats (Pichon et al., 2020). Indeed, research has shown that jealousy can be a strong predictor of partner violence for both men and women (Nelson, 2014).

Both sexes in a relationship may fear infidelity, however, men face the risk of cuckoldry and paternity uncertainty, while women face the risk of resource scarcity (Semchenko, 2021; Buss & Duntley, 2011). Daly and Wilson (1988) proposed male sexual proprietariness as a psychological response to the real or perceived threat of losing women to rivals or women's infidelity. Male sexual proprietariness includes feelings of romantic jealousy, possessiveness, and control which may lead to the use of violence to deal with these threats to their relationship. Violence, motivated by jealousy, is seen as a tool to control women's freedom and sexuality and limit their autonomy (Daly & Wilson, 1988; Buss & Duntley, 2011), which should function in this context to reduce the risk of cuckoldry and infidelity (Larsen, 2023). Having infidelity concerns, which is a specific form of jealousy, can become a trigger for violence between partners (Nemeth et al., 2012). Thus, when a male suspects infidelity or cuckoldry, DV represents one (abhorrent) solution to deal with adaptive problems of sexual infidelity and paternity uncertainty.

In the absence of infidelity, DV may also be used to deter potential rivals. While men may challenge a mate poacher with violence to deter the threat of mate poaching (Wilson & Daly, 1996), this violence has also been found to be directed towards a partner to discourage them from pursuing the mate poacher (Buss & Duntley, 2011). In this way, DV can be used to control a partner and ensure that they do not engage with a potential mate poacher. This kind of violence may deter the partner from other potential rivals and reduce women's self-esteem (Buss & Duntley 2011). Various studies have also found high rates of DV in situations of economic scarcity, poverty, and income inequality (Aizer, 2011; Rashada & Sharaf, 2016;

Renzetti, 2009), which likely arise, in part, due to threats associated with resource scarcity, or, potentially, shifts in mate value discrepancies. While DV may be used to attempt to “protect” a relationship, the use of violence within a relationship is also associated with the loss of various privileges and benefits in society and may only be used in instances where the threat is severe and there is a lack of protection for the victim.

Demographic Factors Influence Rates of Domestic Violence

Following evolutionary logic, women are at a higher risk of experiencing DV when they commit infidelity, if their partner believes they've committed or may commit infidelity (Nemeth et al., 2012), during times of economic hardship (Aizer, 2011; Rashada & Sharaf, 2016; Renzetti, 2009), and when her mate value is or shifts to become higher than her mate's (Buss & Duntley, 2011). Although these risk factors tend to be specific to certain dynamics within a relationship, there are many additional factors that influence a woman's risk of experiencing DV, which are evident more broadly. Wilson and Daly (1993) identified a woman's reproductive potential, proxied by her age, as one such factor. They posited that if DV is being used as a mate retention strategy, then violence should be more prevalent when men seek to control a more evolutionary “valuable” mate (i.e., one with a higher reproductive potential). Though not directly tested, their hypothesis has found support through various studies, including studies investigating uxoricide, which refers to the killing of a woman by her husband (Boughima et al., 2018; Mize et al., 2011; Rennison et al., 2003; Shackelford et al., 2000). For example, Daly and Wilson (1988) found that the risk of uxoricide was very high for younger spouses in North America, and lower for older spouses. Additionally, when investigating patterns in spousal violence and uxoricide by analysing large criminology datasets that assessed both homicide rates and violence against women in Canada, Wilson and colleagues (1995) found that, as a woman's age increased, the likelihood that she would experience DV and uxoricide decreased. Researchers later replicated Wilson and Daly's (1993) hypothesis, that younger reproductive-age women would be more likely to experience DV compared to older women with a declining reproductive value, in an American population as well, using data that contained 3,969 cases of partner abuse perpetrated by males which had been reported to a single police precinct in an urban area in America over 14 years (Peters et al., 2002).

In the present study, we sought to understand and test Wilson and Daly's (1993) hypothesis. First, we conceptually replicated the study done by Peters and colleagues (2002), with an Indian population using publicly available data on rates of DV. Based on these findings, we predicted that younger women would be more likely to experience physical violence compared to older women in India (*H1*).

Beyond age, we also explored associations between other demographic variables (residence type and education) and occurrences of DV (physical violence, and sexual violence as a secondary variable) in India. Research has shown that women in rural areas of India report higher rates of violence than women in urban areas (George et al., 2016; Ram et al., 2019; Richardson et al., 2019). Further, previously published research using the later waves of data we analysed (International Institute of Population Sciences, 2007; 2017) has found that women

living in rural environments experience higher rates of physical violence compared to those from urban environments. This is likely to be due to gaps in levels of literacy, education, poverty, and awareness about DV among rural and urban areas around the world (Ayala, 2020; Suttie, 2020), with rural areas likely to have lesser access to resources and more norms and attitudes supporting or normalizing DV (Deyessa et al., 2010; Strand et al., 2018). Contextual factors such as poverty, unemployment, and low literacy rates, which accompany residence type, are likely to have a large influence on rates of violence against women in rural areas (Das & Roy, 2020). As has been reported in the later waves of data we analysed, we predicted that women living in rural areas would be more likely to experience physical violence compared to women living in urban areas in India across all waves of NFHS (H2).

Finally, we explored how educational attainment influenced rates of violence in women in India. At the individual level, some find that an increase in the education level of women can work as a protective factor for them, decreasing their risk of DV (Deyessa et al., 2010), as higher educational attainment allows for increased autonomy and empowerment. However, evolutionary research has shown that an increase in educational hypergamy (i.e., an increase in the education level of women in comparison to their partner) could increase rates of violence against them as this is likely to increase female mate value and autonomy, which could threaten the dominant status of men in the household (Lin et al., 2020). Although this likely arises in some contexts, broadly, we expected educational attainment to be protective for women in our sample. As such, we predicted that in India, more educated women would be less likely to experience physical violence compared to less educated women (H3).

METHOD

For the purpose of this study, a secondary data analysis was conducted using publicly available data on DV rates in India. Data were examined from four waves of the NFHS which is a large-scale, multi-round survey conducted throughout India in representative samples of households and provides information about fertility, women empowerment, infant and child mortality, reproductive health, and violence against women, among other topics. The survey has been conducted six times to date, with the first survey in 1992-93 (NFHS-1), and the subsequent five waves being as follows: NFHS-2 (1998-99), NFHS-3 (2005-06), NFHS-4 (2015-16), and NFHS-5 (2019-21) and the latest one being NFHS-6 (2023-24), although data were not available from NFHS-6 at the time of our analysis. The following study makes use of data from the middle four waves of NFHS, concerning DV (physical and sexual violence faced by women in India). For our study, we chose physical and sexual violence as indexes of DV, primarily for two reasons. First, physical and sexual violence are two common forms of DV in India with a high prevalence rate (Kalokhe et al., 2016; Richardson et al., 2019; Sharma et al., 2019). Second, only NFHS-3, 4 and 5 explored and measured emotional violence alongside physical and sexual violence, and NFHS-2 only measured physical violence. Thus, to standardise our comparisons across the waves (1998-2021), we chose to explore reported physical violence and trends in

sexual violence to explore any potential similarities that might be indicative of similar trends in DV as a whole in India.

Participants

The sample of women included those in the age groups of 15-49 from both rural and urban areas and included both working women, housewives, ever-married, and never-married women (NFHS-2: 1998-99, $N = 89,199$; NFHS-3: 2005-06, $N = 83,703$; NFHS-4: 2015-16, $N = 79,729$; NFHS-5: 2019-21, $N = 72,056$). See Tables 1 and 2 for the total number of women for each category in the four waves of NFHS-2, -3, -4, and -5 broken down by key demographic categories for physical and sexual violence.

Table 1. Demographic categorization of the total number of women surveyed for physical violence in the last 12 months

Category		Total Number of Women			
		NFHS-2 (N= 89,199)	NFHS-3 (N= 83,703)	NFHS-4 (N= 79,729)	NFHS-5 (N=72,056)
Age	15-19	8,182	16,617	13,592	4907
	20-29	34,134	29,259	27,101	24,230
	30-39	28,183	22,542	21,613	23,613
	40-49	18,701	15,286	17,423	19,306
Residence	Urban	23,370	27,371	28,320	23,280
	Rural	65,829	56,332	51,409	48,776
Education	Illiterate	51,871	34,138	21,199	18,294
	Literate; < middle school complete	17,270	6,600	4,559	4,807
	Middle school complete	7,328	12,557	11,529	10,267
	High school + complete	12,719	30,406	42,443	38,688

Note: Table 1 depicts the total number of women who were surveyed for physical violence in the past 12 months for each category of age, residence, and education level in the middle four waves of NFHS.

Table 2. Demographic categorization of the total number of women surveyed for experience of sexual violence

Category	Total Number of Women			
		NFHS-3 (N= 83,703)	NFHS-4 (N= 79,729)	NFHS-5 (N=72,056)
Age	15-19	16,617	13,592	4,907
	20-24	15,427	13,990	12,190
	25-29	13,832	13,111	12,040
	30-39	22,542	21,613	23,613
	40-49	15,286	17,423	19,306
Residence	Urban	27,371	28,320	23,280
	Rural	56,332	51,409	48,776
Education	No education	34,138	21,999	18,294
	<5 years complete	6,600	4,559	4,807
	5-7 years complete	12,557	11,529	10,267
	8-9 years complete	11,700	13,447	10,643
	10-11 years complete	8,683	11,441	9,818
	12+ years complete	10,023	17,555	18,227

Note: Table 2 depicts the total number of women who were surveyed to understand their experience of sexual violence ever for each category of age, residence, and education level in the four waves of NFHS. Data on sexual violence was not available for NFHS 2.

Procedures

All NFHS surveys conducted from 1998-2021 have been developed and implemented with an objective of providing state and national-level information on important parameters of family planning, fertility, family welfare, and violence against women.

NFHS-2. The NFHS sample covered more than 99% of the Indian population in all 26 states. This was a household survey with around 90,000 ever-married women participants between the ages of 15-49. The NFHS-2 was conducted in two phases, November 1998 and March 1999, through field work and interviewing women within eligible households.

NFHS-3. The fieldwork of NFHS-3 was organised and conducted from December 2005 to August 2006. Eighteen research organisations conducted interviews with women between the ages of 15-49 in eligible households across India.

NFHS-4 and NFHS-5. Data for NFHS-4 was collected using Computer Assisted Personal Interviewing (CAPI) on mini notebook computers from all men and women between the ages of 15-54 from eligible households in 29 Indian states and 6 union territories. The fieldwork for NFHS-4 was organised and conducted from January 2015 to December 2016, and for NFHS-5, the data collection was conducted

in two phases: June 2019 to January 2020 (Phase 1) and January 2020 to April 2021 (Phase 2)

Measures

Different questionnaires were used for collecting information about DV rates in all the NFHS. For the purpose of this study, the analysis is based on the assumption that measurement of different forms of physical violence experienced over the last year would not overlap between and within the waves, even if the same women were interviewed across the waves of data collection. This assumption cannot be met for sexual violence, based on differences in interview question methodology. Below, we describe the questionnaires we analysed, and how they differed between waves of data collection.

NFHS-2 and NFHS-3. In the NFHS-2 and 3 conducted in 1998-99 and 2005-06, questions on violence against women, including physical and sexual violence were collected through the Woman's Questionnaire. This questionnaire mainly assessed information from ever-married women between the ages of 15-49, who were usual residents of the sample households. These questionnaires were developed after thorough research by the Ministry of Health and Family Welfare and were available in both the regional language as well as English (International Institute for Population Sciences, 2000; 2007).

The methodology for collecting data on DV was different in both NFHS-2 and NFHS-3, with NFHS-3 being much more comprehensive (Golder, 2016). NFHS-2 included three specific questions on DV in the 'status of woman' section of Women's questionnaire, but for our analysis, we used the following question to assess rates of women who had experienced physical DV in the last year, "How often have you been beaten or mistreated physically in the last 12 months?" (Once/A few times/Many times/Not at all). The sexual violence statistics were not measured in NFHS-2 but were measured from NFHS-3 onwards.

NFHS-3 included a module of questions on DV in the Woman's questionnaire, which was used to gather information on various forms of DV such as physical, sexual, and emotional violence by husbands against their wives. To assess rates of physical violence in the last 12 months and sexual violence ever among ever married women, we used responses to the question "(Does/did) your (last) husband ever do any of the following things to you: a) Slap you? b) Twist your arm or pull your hair? c) Push you, shake you, or throw something at you? d) Punch you with his fist or with something that could hurt you? e) Kick you, drag you or beat you up? f) Try to choke you or burn you on purpose? g) Threaten or attack you with a knife, gun, or any other weapon? h) Physically force you to have sexual intercourse with him even when you did not want to? i) Force you to perform any sexual acts you did not want to?" with the response range of 'yes' or 'no' for every item followed by a question on "how often did this happen?" (often/sometimes/not at all). A 'yes' to one or more items from (a) to (g) constituted evidence of physical violence and a 'yes' response to items (h) or (i) constituted evidence of sexual violence. Additionally, question on physical violence committed by anyone since they were age of 15 by being hit, slapped, or kicked to physically hurt were asked from all women, both married and unmarried to understand rates of physical violence in the last 12 months.

NFHS-4 and NFHS-5. The NFHS-4 and -5, which were conducted in 2015-16 and 2019-21, utilised a similar type of questionnaire to the previous waves, using the Computer Assisted Personal Interviewing (CAPI) in 17 local languages for NFHS-4 and 18 local languages for NFHS-5. CAPI is a technique for data collection on a portable device. It is cost-effective, provides immediate availability of data and is easy to use (Brahme et al., 2018). Questions on DV, including physical and sexual violence were collected through the Woman's Questionnaire. This questionnaire mainly covered information from ever-married and never-married women in the age group of 15-49 for NFHS-4 and 18-49 for NFHS-5, who were usual residents of the sample households. For DV, only one eligible woman was randomly selected per household to share answers on their experience of DV. This was done to comply with ethical requirements and protect potential victims (International Institute for Population Sciences, 2017; 2021). Questions on physical violence committed by anyone since they were age of 15 by being hit, slapped, or kicked to physically hurt were asked from all women, both married and unmarried. For the purpose of this study to assess rates of physical violence and sexual violence, we used responses to the same questions as in NFHS-3. For our analysis of reported physical violence, we utilised data from the "often or sometimes" category of percentages of women who had experienced violence in the last 12 months for NFHS-3, 4 and 5.

Data Analysis

To investigate how women's age, residence type, and education level were related to rates of reporting being physically abused in the past 12 months across the waves of data collection, we used a series of chi-square Goodness of Fit analyses. Prior to conducting data analysis, the number of women in each category (including age group, education level, and residence type) reporting on having been the victim of physical violence in the last year, or sexual violence ever, were calculated from the given percentages for all the waves, which span over a period of more than 20 years. We then investigated if age predicted differences in rates of reported physical violence within each wave of data by comparing the rates of women reporting violence within each of the four age categories to what would be expected by chance within the full sample for the wave (i.e., if age did not influence the likelihood of reporting physical violence). For example, for age, expected values were computed by multiplying the sum of women reporting abuse by the sum of women in a given age category, divided by the total sum of the sample. After investigating the impact of age on rates of reported physical violence, we investigated the impact of residence type (urban vs. rural) and level of educational attainment. For physical violence, we conducted four chi-square tests for age, four for residence types, and four for education levels. Here, we report if rates of physical violence are significantly higher or lower for each group than would be expected by chance, with expected values being those that would occur if demographic influences (age, residence type, and education levels) do not influence rates of physical violence. We used Bonferroni adjustments to correct for multiple comparisons, adjusting our cut-off p -value from ($\alpha \leq .050$) to ($\alpha \leq .004$). Only p values $\leq .004$ were interpreted as significant.

We also report trends of rates of sexual violence reported during the same time periods. Because the sexual violence questions were asked for lifetime

experience as opposed to experience within the last year, we did not conduct chi-square analyses to explore rates of sexual violence over time. This difference in survey techniques resulted in data that may violate assumptions of independence required for a chi-square goodness of fit test. These data were, however, graphed to visualize the trends and understand the changes in these trends across the waves of data collection.

RESULTS

Physical Violence

Physical violence for all the waves of NFHS were measured as percentage of women who were physically abused in the past 12 months. These data were used to calculate the number of women in each category of age group, residence type, and education level who reported being a victim of physical violence in the last year.

Age

Four chi-square analyses, one per wave, were performed age-wise to determine if experiencing physical violence varied as a function of age in women in India (see Table 3) within each wave of data collection.

NFHS-2. Age was a significant predictor of rates of physical violence in NFHS-2, $X^2(3, N = 89,200) = 294.89, p \leq .001, V = 0.06$. Specifically, women between the ages of 20-29 experienced significantly higher rates of physical violence, $X^2(1, n = 4,233) = 72.21, p \leq .001$, than would be expected if age did not influence rates of physical violence. Additionally, women between the ages of 40-49 reported significantly lower rates of physical violence than would be expected if age did not influence rates of physical violence, $X^2(1, n = 1421) = 216.99, p \leq .001$. Results did not reveal an impact of age on rates of physical violence in women who were between the ages of 15-19 or 30-39 within this wave, $ps \geq .071$.

NFHS-3. Age was a significant predictor of rates of physical violence in NFHS-3, $X^2(3, N = 83,704) = 529.34, p \leq .001, V = 1.07$. Here, we found significantly higher rates of physical violence in women between the ages of 20-29, $X^2(1, n = 6320) = 137.63, p \leq .001$, and 30-39, $X^2(1, n = 4734) = 63.99, p \leq .001$, than what would be expected if age did not influence rates of physical violence. Additionally, we found significantly lower rates of physical violence in women ages 15-19, $X^2(1, n = 2409) = 211.39, p \leq .001$, and 40-49, $X^2(1, n = 2369) = 116.33, p \leq .001$, than what would be expected if age did not influence rates of physical violence.

NFHS-4. In NFHS-4, age was a significant predictor of rates of physical violence, $X^2(3, N = 79,729) = 802.49, p \leq .001, V = 1.64$. Here, we found that women between the ages of 15-19, $X^2(1, n = 1726) = 584.99, p \leq .001$, reported lower rates of physical violence than what would be expected if age did not influence rates of physical violence, while women in the older age groups [30-39: $X^2(1, n = 5360) = 170.22, p \leq .001$; 40-49: $X^2(1, n = 4060) = 47.28, p \leq .001$] reported higher rates of physical violence than what would be expected if age did not influence rates of physical violence. Results did not reveal an impact of age on rates of physical violence

in women who were between the ages 20-29, $X^2(1, n = 5736) = 0$, $ps \geq .097$, within this wave.

NFHS-5. In NFHS-5, age was a significant predictor of rates of physical violence, $X^2(3, N = 72,056) = 495.12$, $p \leq .001$, $V = 1.07$. Within age groups, we found that women in the youngest age groups [15-19: $X^2(1, n = 564) = 321.44$, $p \leq .001$; 20-29, $X^2(1, n = 4915) = 47.17$, $p \leq .001$] reported lower rates of physical violence than what would be expected if age did not influence rates of physical violence, while women in the older age groups [30-39: $X^2(1, n = 5785) = 77.85$, $p \leq .001$; 40-49: $X^2(1, n = 4672) = 48.66$, $p \leq .001$] reported higher rates of physical violence than what would be expected if age did not influence rates of physical violence.

Interim Summary of Results: Age and Physical Violence

Across analyses, we see that rates of physical violence reported by women aged 15-19 remain low, with lower rates than what would be expected if age did not influence the likelihood of reporting physical violence in the later three waves. In partial support of our predictions, women between the ages of 20-29 reported higher levels of physical violence than would be expected if age did not influence the likelihood of reporting physical violence in the first two waves of data collection, however, they also reported lower rates of physical violence in the final wave of data collection than would be expected if age did not influence the likelihood of reporting physical violence. Across the three later waves of data collection, women between the ages of 30-39 reported higher rates of DV than would be expected if age did not influence the likelihood of reporting physical violence. Finally, while in the first two waves, women in the age group of 40-49 reported lower levels of physical violence than would be expected if age did not influence the likelihood of reporting physical violence, they reported higher rates of physical violence than would be expected if age did not influence the likelihood of reporting physical violence in the latter two waves of data collection. While we expected to see consistently high rates of physical violence reported by younger women across waves of data collection, we instead saw this pattern shifting, with older women reporting increasing rates of physical violence in the later waves of data collection.

Table 3. Chi-square analysis of women in different age groups who experienced physical violence in the last year

Year	Age	Observed <i>n</i>	Expected <i>n</i>	Chi-Square	Direction of Effect	<i>p</i> value
NFHS-2	15-19	941	897	2.41	↑	.120
	20-29	4233	3742	72.21*	↑	≤ .001
	30-39	3185	3090	3.28	↑	.071
	40-49	1421	2050	216.99*	↓	≤ .001
NFHS-3	15-19	2409	3143	211.39*	↓	≤ .001
	20-29	6320	5535	137.63*	↑	≤ .001
	30-39	4734	4264	63.99*	↑	≤ .001

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	40-49	2369	2891	116.33*	↓	≤ .001
NFHS-4	15-19	1726	2878	584.99*	↓	≤ .001
	20-29	5736	5738	0	=	.970
	30-39	5360	4576	170.22*	↑	≤ .001
	40-49	4060	3689	47.28*	↑	≤ .001
	15-19	564	1085	321.44*	↓	≤ .001
NFHS-5	20-29	4915	5359	47.17*	↓	≤ .001
	30-39	5785	5222	77.85*	↑	≤ .001
	40-49	4672	4270	48.66*	↑	≤ .001

Note: * $p < .004$; ↑ higher than expected by chance; ↓ lower than expected by chance; = the same as what would be expected by chance. Expected values calculated from full sample within each wave if age did not influence rates of physical violence.

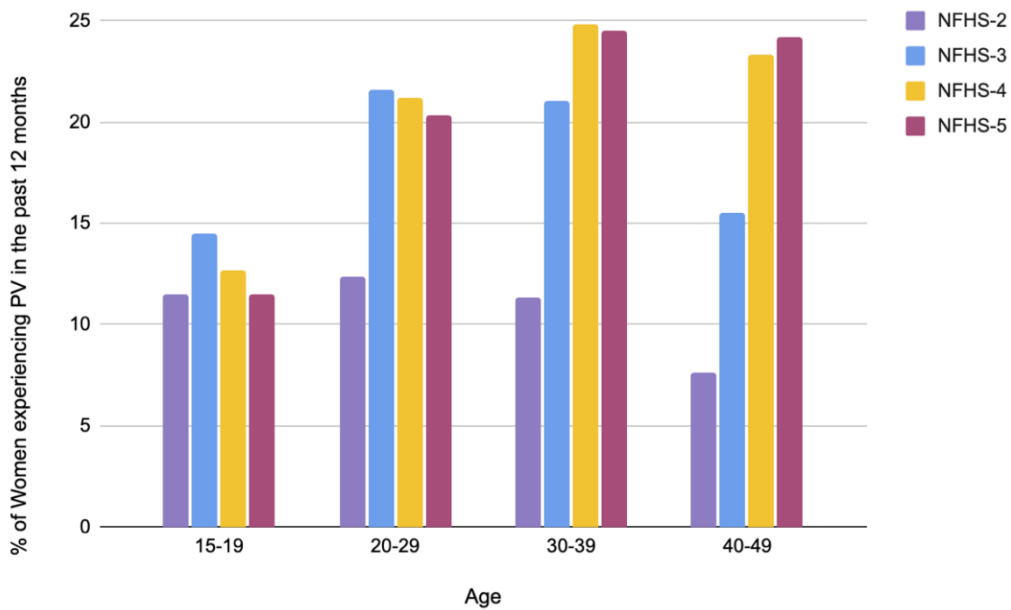


Figure 1. Percentage of women in different age groups who experienced physical violence (PV) in the last year.

Residence Type

Four chi-square analyses, one per wave, were performed to determine if experiencing physical violence varied as a function of residence type in women in India (see Table 4) within each wave of data collection.

NFHS-2. Residence type was a significant predictor of rates of physical violence in NFHS-2, $X^2(1, N = 89,199) = 356.46, p \leq .001, V = 1.19$. Women in rural areas experienced significantly higher rates of physical violence, $X^2(1, n = 8031) = 93.39, p \leq .001$, than would be expected if residence type did not influence rates of physical violence. Women in urban areas, however, reported significantly lower rates of physical violence, $X^2(1, n = 1799) = 263.07, p \leq .001$, than would be expected if residence type did not influence rates of physical violence.

NFHS-3. Residence type was a significant predictor of rates of physical violence in NFHS-3 as well, $X^2(1, N = 83,703) = 432.03, p \leq .001, V = 1.49$. Within residence types, women in rural areas experienced significantly higher rates of physical violence, $X^2(1, n = 11773) = 141.27, p \leq .001$, than would be expected if residence type did not influence rates of physical violence. As in NFHS-2, women in urban areas reported significantly lower rates of physical violence, $X^2(1, n = 4078) = 290.76, p \leq .001$, than would be expected if residence type did not influence rates of physical violence.

NFHS-4. In NFHS-4, the same patterns emerged, with residence type predicting rates of physical violence, $X^2(1, N = 79,729) = 296.03, p \leq .001, V = 1.05$. Women in rural areas reported experiencing significantly higher rates of physical violence, $X^2(1, n = 11824) = 105.15, p \leq .001$, and women residing in urban areas however reported significantly lower rates of physical violence, $X^2(1, n = 5041) = 190.88, p \leq .001$, than would be expected if residence type did not influence rates of physical violence.

NFHS-5. Once again, residence type influenced rates of physical violence in NFHS-5, $X^2(1, N = 72,056) = 397.72, p \leq .001, V = 1.48$. As found in previous waves of data, women in rural areas experienced significantly higher rates of physical violence, $X^2(1, n = 11853) = 128.5, p \leq .001$, and in urban areas, women reported significantly lower rates of physical violence, $X^2(1, n = 4121) = 269.22, p \leq .001$, than would be expected if residence type did not influence rates of physical violence.

Interim Summary of Results: Residence Type and Physical Violence

Throughout the four waves of data collection, we found that women in rural areas reported higher rates of physical violence than what would be expected if the residence type of women did not influence the likelihood of reporting physical violence, and that women in urban areas reported lower rates of physical violence than what would be expected if the residence type of women did not influence the likelihood of reporting physical violence. These results support our prediction that women in rural areas would report higher rates of physical violence than women in urban areas of India across the different waves of data collection. Additionally, despite decreasing total sample sizes from NFHS-2 to NFHS-5, overall, the number of women reporting physical violence in both rural and urban areas increased through NFHS-4, with only a small decrease from NFHS-4 to NFHS-5 in urban areas.

Table 4. Chi-Square analysis of women living in urban vs. rural residence types who experienced physical violence in the last year

Year	Residence	Observed <i>n</i>	Expected <i>n</i>	Chi-Square	Direction of Effect	<i>p</i> value
NFHS-2	Urban	1799	2575	263.07*	↓	≤ .001
	Rural	8031	7255	93.39*	↑	≤ .001
NFHS-3	Urban	4078	5183	290.76*	↓	≤ .001
	Rural	11773	10668	141.27*	↑	≤ .001
NFHS-4	Urban	5041	5991	190.88*	↓	≤ .001
	Rural	11824	10874	105.15*	↑	≤ .001
NFHS-5	Urban	4121	5161	269.22*	↓	≤ .001
	Rural	11853	10813	128.5*	↑	≤ .001

Note: * $p < .004$; ↑ higher than expected by chance; ↓ lower than expected by chance; = the same as what would be expected by chance. Expected values were calculated from the full sample within each wave if age did not influence rates of physical violence.

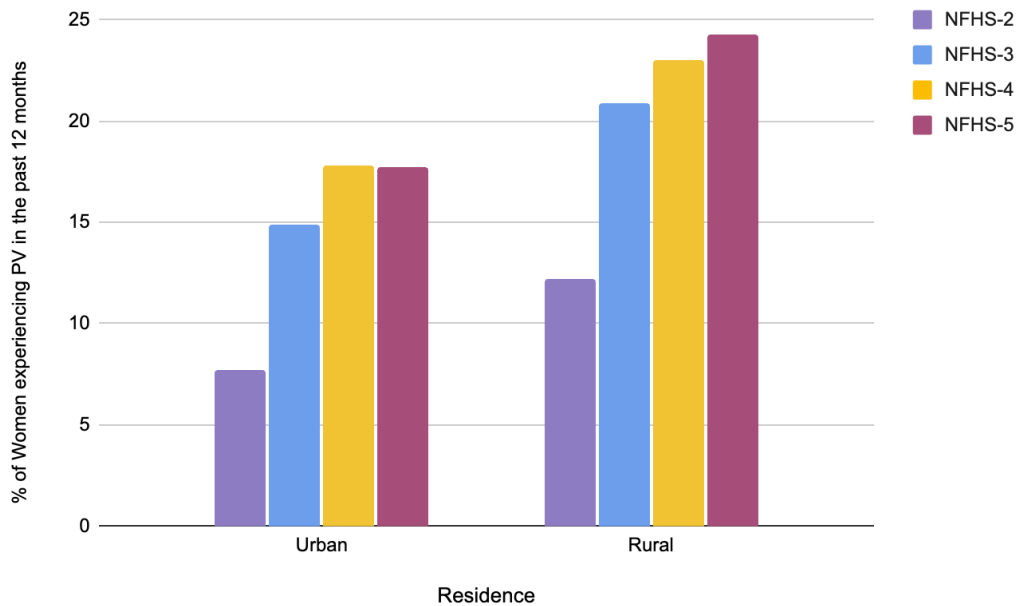


Figure 2. Percentage of women in different residence types who experienced physical violence (PV) in the past year.

Education Level

Four chi-square analyses, one per wave, were performed to determine if experiencing physical violence varied as a function of education type in women in India (see Table 5) within each wave of data collection.

NFHS-2. Education level was a significant predictor of rates of physical violence in NFHS-2, $X^2(3, N = 89,188) = 1426.28, p \leq .001, V = 2.76$. Results revealed that illiterate women reported significantly higher rates of physical violence, $X^2(1, n = 7314) = 511.65, p \leq .001$, than would be expected if education level did not influence rates of physical violence. Further, women in the literate, < middle school complete category, $X^2(1, n = 1520) = 84.82, p \leq .001$, those who completed middle school, $X^2(1, n = 513) = 119.41, p \leq .001$, and those who completed high school and above, $X^2(1, n = 458) = 710.4, p \leq .001$, experienced significantly lower rates of physical violence than would be expected if education level did not influence rates of physical violence.

NFHS-3. The education level of women was a significant predictor of rates of physical violence in NFHS-3 as well, $X^2(1, N = 83,701) = 2321.5, p \leq .001, V = 4.63$. Illiterate women, $X^2(1, n = 8739) = 994.44, p \leq .001$, and women in the literate, < middle school complete category of educational attainment, $X^2(1, n = 1445) = 38.19, p \leq .001$, reported significantly higher rates of physical violence than would be expected if education level did not influence rates of physical violence. However, women who had completed high school and above the level of education, $X^2(1, n = 3300) = 1288.49, p \leq .001$, reported lower rates of physical violence than would be expected if education level did not influence rates of physical violence. Results did not reveal an impact of education level on rates of physical violence in women who had completed middle school level of education, $X^2(1, n = 2348) = 0.38, p \geq 0.536$.

NFHS-4. Within this wave, the education level of women was again a significant predictor of rates of physical violence, $X^2(3, N = 79,730) = 2270.66, p \leq .001, V = 4.64$. Results revealed that illiterate women, $X^2(1, n = 6508) = 1156.01, p \leq .001$, women in the literate, < middle school complete category of education level, $X^2(1, n = 1213) = 81.03, p \leq .001$, and those who completed middle school, $X^2(1, n = 2790) = 63.8, p \leq .001$, reported higher rates of physical violence than would be expected if education level did not influence rates of physical violence. However, women who completed high school and above level of education, $X^2(1, n = 6361) = 969.82, p \leq .001$, reported significantly lower rates of physical violence than would be expected if education level did not influence rates of physical violence.

NFHS-5. For the latest wave of data collection, the education level of women was again a significant predictor of physical violence, $X^2(1, N = 72,056) = 1730.33, p \leq .001, V = 3.72$. Results revealed similar trends as NFHS-4, wherein illiterate women, $X^2(1, n = 5736) = 932.15, p \leq .001$, those who were in the literate, < middle school complete level of education, $X^2(1, n = 1173) = 14.38, p \leq .001$, and those who completed middle school education, $X^2(1, n = 2628) = 71.53, p \leq .001$, reported significantly higher rates of physical violence than would be expected if education level did not influence rates of physical violence. However, women who completed high school and above level of education, $X^2(1, n = 6383) = 712.27, p \leq .001$, reported significantly lower rates of physical violence than would be expected if education level did not influence rates of physical violence.

Interim Summary of Results: Education Levels and Physical Violence

Here, we found that education level predicted physical violence in India. The least educated women across the four waves of NFHS reported significantly higher rates of violence than would be expected if education level did not influence rates of physical violence. Further supporting our prediction that more educated women would be less likely to experience physical violence compared to less educated women, we found that highly educated women (high school and above) reported significantly lower rates of physical violence than would be expected if education level did not influence rates of physical violence across all waves of data collection. Across the waves of data collection, we also note a shift wherein women with some level of education (up to middle school), who had lower than expected rates of physical violence in NFHS-2 and expected rates of physical violence in NFHS-3, also reported significantly higher rates of physical violence in NFHS-4 and -5 than would be expected if education levels did not influence rates of physical violence. These results suggest a shift over the years, with women with mid-level educational attainment becoming more likely to experience physical violence across time.

Table 5. *Chi-Square analysis of women with different education levels who experienced physical violence in the last year*

Year	Education Level	Observed <i>n</i>	Expected <i>n</i>	Chi-Square	Direction of Effect	<i>p</i> value
NFHS-2	Illiterate	7314	5703	511.65*	↑	≤ .001
	Literate, < middle school complete	1520	1899	84.82*	↓	≤ .001
	Middle school complete	513	806	119.41*	↓	≤ .001
	High school complete and above	458	1398	710.4*	↓	≤ .001
NFHS-3	Illiterate	8739	6458	994.44*	↑	≤ .001
	Literate, < middle school complete	1445	1248	38.19*	↑	≤ .001
	Middle school complete	2348	2375	0.38	=	0.536
	High school complete and above	3300	5752	1288.49*	↓	≤ .001
NFHS-4	Illiterate	6508	4486	1156.01*	↑	≤ .001

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	Literate, < middle school complete	1213	965	81.03*	↑	≤ .001
	Middle school complete	2790	2440	63.8*	↑	≤ .001
	High school complete and above	6361	8981	969.82*	↓	≤ .001
	Illiterate	5763	4049	932.15*	↑	≤ .001
	Literate, < middle school complete	1173	1064	14.38*	↑	≤ .001
NFHS-5	Middle school complete	2628	2272	71.53*	↑	≤ .001
	High school complete and above	6383	8562	712.27*	↓	≤ .001

Note: * $p < .004$; ↑ higher than expected by chance; ↓ lower than expected by chance; = the same as what would be expected by chance. Expected values were calculated from the full sample within each wave if education level did not influence rates of physical violence.

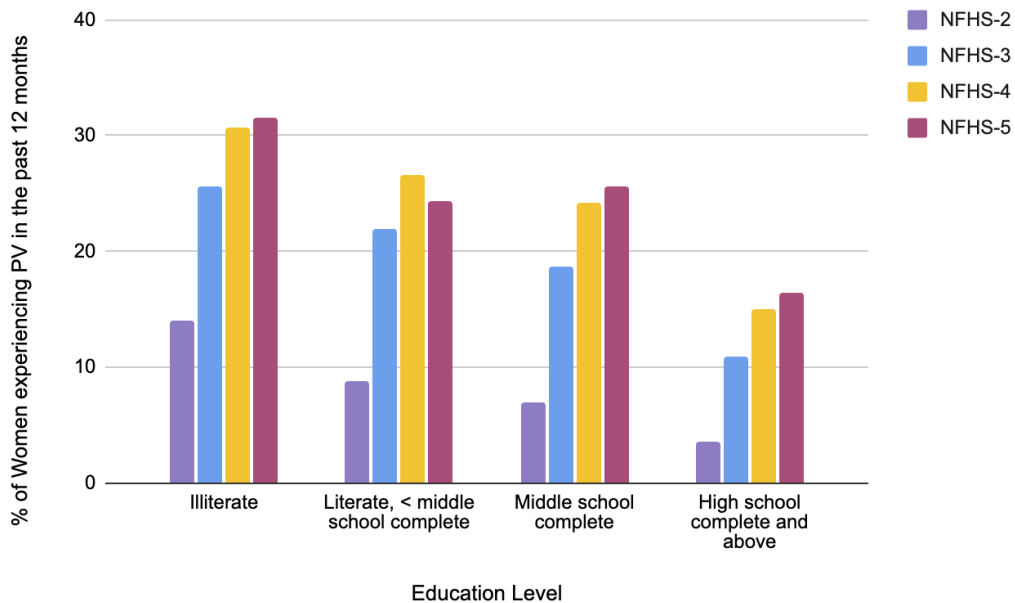


Figure 3. Percentage of women across education levels who experienced physical violence (PV) in the past year.

Sexual Violence

Sexual violence for all the waves of NFHS was measured as the percentage of women who have ever experienced sexual violence in their lives. This data was used to calculate the number of women in each category of age group, residence type, and education level who reported being victim of sexual violence. No chi-square analyses were conducted for sexual violence as it was not measured over the past 12 months but as an experience over a lifetime. Instead, general trends are reported. See Table 6 for percentage of women who reported having ever experienced sexual violence within each age, residence type, and education level category for each wave and Figures 4-6 for a graphical depiction of the data.

Table 6. *Percentage of women who have experienced sexual violence by age, residence type, and education level*

Category		Total Number of Women		
		NFHS-3 (N= 83,703)	NFHS-4 (N= 79,729)	NFHS-5 (N=72,056)
Age	15-19	4.5%	2.8%	3.5%
	20-24	8.6%	4.6%	4.2%
	25-29	10.2%	6.8%	6.2%
	30-39	10.2%	7.1%	7.0%
	40-49	8.5%	6.9%	6.5%
Residence	Urban	5.9%	4.7%	4.7%
	Rural	9.7%	6.4%	6.7%
Education	No education	12.1%	8.9%	8.8%
	<5 years complete	10.5%	7.6%	8.9%
	5-7 years complete	8.1%	6.1%	6.8%
	8-9 years complete	6.0%	5.1%	5.3%
	10-11 years complete	3.7%	4.1%	4.8%
	12+ years complete	2.3%	3.2%	3.2%

Domestic Violence and Age

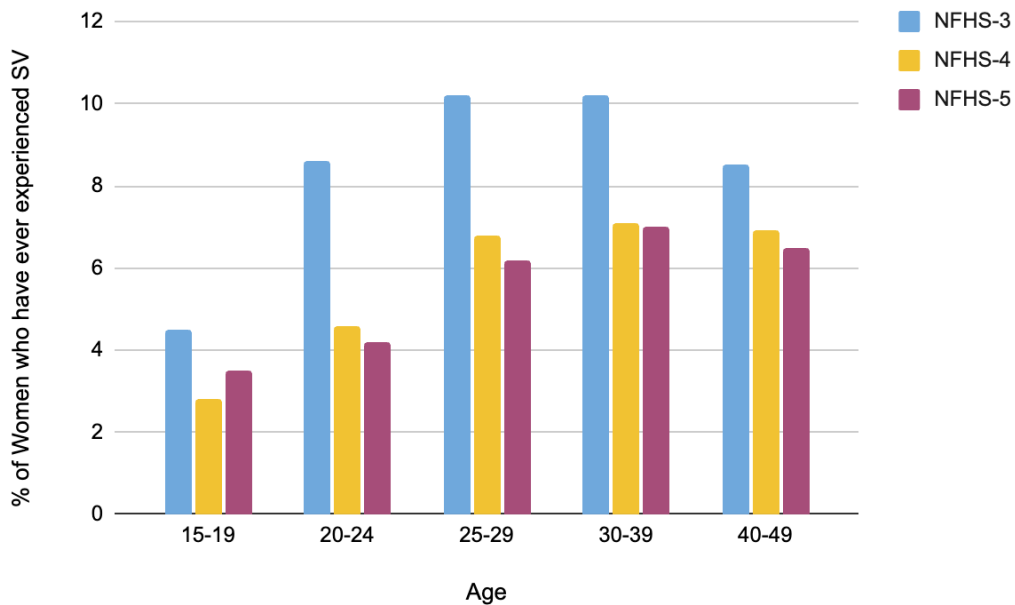


Figure 4. Percentage of women in different age groups who have experienced sexual violence.

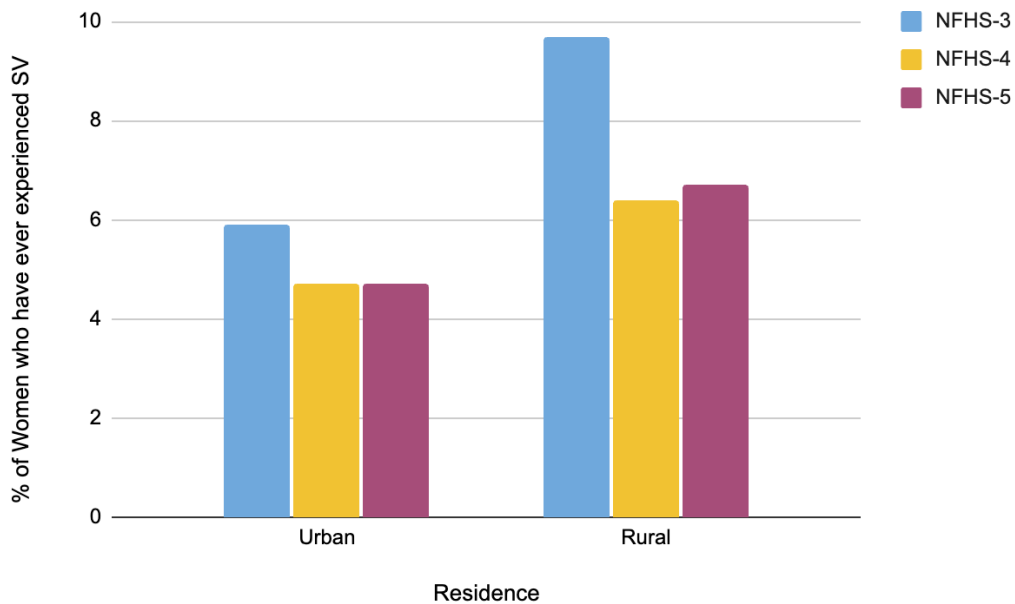


Figure 5. Percentage of women living in different residence types who have experienced sexual violence.

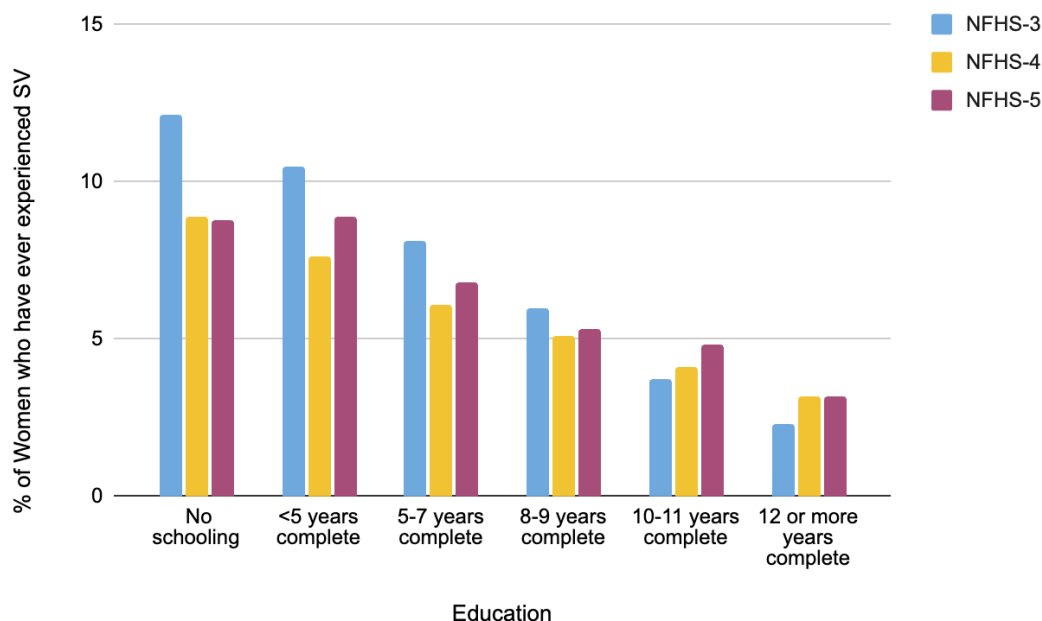


Figure 6. Percentage of women across education levels who have experienced sexual violence

Interim Summary of Results: Trends in Sexual Violence

In NFHS-3, women in the age group of 25-29 (10.2%) and 30-39 (10.2%) reported a higher rate of sexual violence compared to women in other age groups. Although in NFHS-4 and NFHS-5, older women in the age groups of 30-39 (7.1%; 7.0%) and 40-49 (6.9%; 6.5%) reported higher levels of sexual violence compared to women in younger age groups, rates in women in the age group of 25-29 remained elevated across later waves as well (6.8%; 6.2%). Generally, women in rural areas reported higher rates of sexual violence compared to women in urban areas, although this difference was smaller in NFHS-4 and NFHS-5 than in NFHS-3. Finally, women in the no schooling category experienced the highest rate of sexual violence compared to women in higher categories of educational attainment.

DISCUSSION

DV (i.e., aggressive behaviour by either or both individuals in a close relationship) can have severe physical, psychological, and economic consequences for its victims, including physical injuries, depression, anxiety, suicidal ideation, and death (Campbell, 2002; Levendosky et al., 2012). Thus, studying and understanding DV from multiple lenses becomes important to understand its implications and impact on women. Past research on DV has found that age can be an important determinant of whether an individual is a victim of DV or not along with their susceptibility to

becoming one (Peterman, 2015). Wilson and Daly (1993) proposed that younger women with a high reproductive value are at a greater risk of becoming victims of DV as compared to older women with a lower reproductive value. This hypothesis has found support within WEIRD populations (e.g., Peters et al., 2002), however, to the authors' knowledge, there is no extant research assessing associations between age and other demographic factors (such as residence type and education level of women) and prevalence of DV in India, where rates of DV are extremely high.

To address this research gap, this study was conducted to explore associations between demographic factors (primarily age, but also residence type and education level of women) and DV in India using publicly available data from four waves of the NFHS (1998-2021). For our study, we assessed reported physical violence and explored trends in sexual violence, utilising these factors together to estimate and discuss trends in the rates of DV in India. We predicted that (*H1*) younger women would be more likely to experience physical violence compared to older women in India, (*H2*) women living in rural areas would be more likely to experience physical violence compared to women living in urban areas in India, and (*H3*) more educated women would be less likely to experience physical violence compared to less educated women in India.

Results partially supported our first hypothesis that younger women would be more likely to experience physical violence compared to older women in India. We found that in the earlier waves of data collection (NFHS-2 and NFHS-3) younger women in the age groups of 20-29 reported significantly higher rates of physical violence than would be expected if age did not influence rates of physical violence, a pattern not found in women in other age groups. However, in the later waves of data collection (NFHS-4 and NFHS-5), we found older women (i.e., women in the age groups of 30-39 and 40-49) reported higher rates of physical violence than would be expected if age did not influence rates of physical violence, which was not the case with women from other age groups. We found a somewhat similar trend in sexual violence as well. In NFHS-3, rates of sexual violence were high from age 20-49, whereas in the later waves of data collection (NFHS-4 and NFHS-5), the percentage of women in the age groups of 30-39 and 40-49 who had experienced sexual violence ever was relatively higher compared to rates in younger age groups. Rates of sexual violence for women aged 25-29 remained somewhat elevated across the waves.

Our findings are not wholly consistent with previous research (Peters et al., 2002; Wilson & Daly, 1995). That is, while we found some support for our first hypothesis in the earlier two waves of data collection on physical violence, these patterns shifted in the later waves of data we analysed. Some of these differences are likely attributable to the effects of time, others to differences in survey methodology, and others still attributable to the interplay of various social, cultural, and cognitive factors that differ between the populations assessed. To disentangle the effects of time from those relating to cultural differences, future research should investigate if the patterns reported in past work (Peters et al., 2002; Wilson & Daly, 1995) are consistent across time, or if shifts in the associations between age and rates of DV in WEIRD countries are occurring, similar to those we have observed in Indian women in the current study.

We were surprised to find that older women in India in NFHS-4 and NFHS-5 reported relatively high rates of DV compared to the previous waves and compared

to younger women. Studies have shown that coming from an abusive family can increase an individual's chances of becoming a victim or perpetrator of DV, as acceptance of violent behaviour is often elevated (Huecker et al., 2023; Hyde-Nolan & Juliao, 2012). Older women may come from families where DV was more prevalent and were taught to compromise, not stand against violence, and stay in an abusive relationship. Thus, DV may be more acceptable to older women, whereas younger women with more education and awareness today may not accept these behaviours, which might explain our unexpected results. Increased awareness of women's rights and female empowerment in more recent years is more prevalent in modern generations, who may no longer be accepting the patriarchal status quo. This could result in younger women with greater autonomy over their lives being less willing to tolerate DV compared to older women in the more recent waves of data collection.

Results supported our second hypothesis that women living in rural areas would be more likely to experience physical violence compared to women living in urban areas. In general, through all four waves of data collection, we found that women in rural areas reported higher rates of physical violence in the last 12 months than what would be expected if the residence type of women did not influence physical violence, and women in urban areas reported lower rates of physical violence than what would be expected if the residence type of women did not influence physical violence. In rural areas, a constant increase in rates of physical violence has emerged as a trend from 1998-2021, whereas this is not the case in urban areas. In the case of sexual violence, a similar trend emerged with high rates of sexual violence in rural areas as compared to urban areas, and sexual violence has generally decreased over the years. Our findings are consistent with previous research which has found that women in rural areas experience significantly higher rates of DV compared to women in urban areas (Ajah et al., 2014; Peek-Asa et al., 2011; Sabri et al., 2022). This increase in sexual violence in rural areas over the years may be the result of more migration of younger women to urban areas and women becoming more autonomous and breaking traditional gender norms, while older women who may be uneducated stay back in rural areas, hence the greater acceptance of violence in the community. With younger women challenging the status quo, those who do remain in more rural areas may experience more DV if families are more violent towards them for defying expectations of gender roles and cultural norms.

Results generally supported our third hypothesis that more educated women would be less likely to experience physical violence compared to less educated women. In the case of physical violence, we observed that as the education level of women increased, violence decreased. We found that illiterate women across the four waves of NFHS reported significantly higher rates of violence than would be expected if education level did not influence rates of physical violence. Highly educated women (high school and above) reported significantly lower rates of physical violence than would be expected if education level did not influence rates of physical violence across all waves of data collection. However, within each educational category, an interesting trend emerged where we observed an increase in the percentage of women experiencing violence over time. This helps to explain that even though the rates of violence decrease as women become more highly educated, overall, the rates of violence have increased within all categories of educated women, but especially in those with a moderate level of education (i.e., up to high school level of education).

In the case of sexual violence, we observed similar patterns, whereby increases in the education level of women corresponded with decreases in the percentage of women experiencing sexual violence. In the most highly educated women, we observed an increase in the rates of sexual violence over the years, although it should be noted that the overall number of women becoming highly educated also increased substantially over this time period as well.

While illiterate women are still the most likely to experience DV, education may be less protective now than it has been in the past. In more recent waves of data collection, highly educated women in India are more likely than they were in the past to experience DV, although still far less likely than women who are illiterate. One possibility is that this small increase in DV in highly educated women is a result of violation of hypergamy, which is the process of engaging in a relationship with someone with a higher level of status and more resources (Esteve et al., 2016). Due to violation of educational hypergamy, wherein women are becoming more educated or equally educated to men, they might face or be facing increased DV, if they are thought of as threatening the dominant status of men in the household (Weitzman, 2014). Increasing awareness among women about their rights as they gain more education may also help explain this trend, as this has historically led to reduced rates of violence as the level of education increases, but could also be leading to increased *reporting* of physical and sexual violence in recent years, as awareness of women's rights rises. With an increase in the education attainment of women, there is often also an accompanying increase in their career progression (Islam & Mohammad, 2015). This career growth may lead to mate value discrepancies between a highly educated woman and her spouse, and, ultimately, DV (Buss & Duntley, 2011).

Besides these factors, various economic factors may help understand the increases and decreases in occurrences of DV associated with various demographic factors. Trend data from NFHS shows that women's employment has decreased over 16 years (2005-2021). Studies have shown that unemployment of both men and women creates stress of job loss, income insecurity, and staying at home, hence we might be observing higher physical and sexual violence rates as women's unemployment rates rise (Bhalotra, 2020; Krishnan et al., 2011), and perhaps this impacts women in the older age group more so than those in the younger age groups. In the later waves of NFHS data, unemployment was higher than in the earlier waves, which may help to explain the increase in the rates of DV among older women specifically. From a socio-evolutionary perspective, women who earn more than men may face violence because that may threaten the dominant status of men in the household. Indeed, researchers find that DV increases in such instances (Lin et al., 2020). Educated women with more resources in the older age groups might also experience this phenomenon more than younger, less educated women, although this explanation is speculative.

Strengths, Limitations, and Future Directions

To our knowledge, our study is the first to test Wilson and Daly's (1993) hypothesis on age and occurrences of DV with data in Indian women. While this was a secondary analysis, it provides an enhanced understanding of the trends and prevalence of DV in India over a span of more than 20 years. Understanding the

trends in rates of experiencing DV is vital to inform policy and law formulation and for developing resources, both for survivors and bystanders, to increase DV awareness. Another strength of our study is the large sample size that was collected for this nationwide survey, making these results highly representative of women in India from 1998-2021.

Besides these strengths, our study has some limitations as well. First, since this analysis was done on secondary data in India, the results cannot be generalised outside of this context. Second, we were unable to ask key questions about DV and its occurrence or ask questions in ways best suited to data analysis. For example, the item used to derive statistics on physical violence in NFHS-2, “How often have you been beaten or mistreated physically in the last 12 months?” may not only account for DV, but rather violence that could have been acted out by others including strangers as well. As such, with the data available from NFHS, we found that among ever-married women in NFHS-2, only a small percentage of violence was perpetrated by those outside the family (12.2%). The purpose of our study and analysis was not to explore the prevalence of violence by different perpetrators of the violence but rather to evaluate the estimates of DV for all women over the different waves of NFHS (1998-2021), however, inconsistencies in survey methodology between waves of NFHS data collection warrant caution when comparing results over time. Third, the women’s questionnaire in the NFHS only considered and interviewed one woman from every family who was a victim of DV due to ethical considerations. While this may present a holistic image of the number of households where DV may be occurring, there is most likely an underreporting of the actual number of women in the country who may be facing DV. This might be indicative of the fact that the percentage of women being abused may be higher than what is being reported in the public data, both due to the sampling technique employed, and due to women’s general tendency to underreport DV (International Institute for Population Sciences, 2007).

Fourth, the data on sexual violence was only collected from NFHS 3 onwards which prevents an accurate account of the prevalence of this form of DV before 2005 in India. The conceptualisation of both physical and sexual violence was not matched, which might have influenced our results. Physical violence was measured as being experienced over the last 12 months whereas sexual violence was measured as being experienced ever, which may be additive with every wave and experiences of sexual violence might have been counted multiple times if the same woman was interviewed across the waves. It should also be noted that phase 2 of the NFHS-5 was collected during the recent global pandemic, COVID-19, from January 2020 to April 2021. The pandemic and its associated restrictions and lockdowns around the world led to an increase in the instances of DV (Sharma et al., 2020; United Nations, 2020), which likely increased the rates of DV in India as well. Finally, as noted above, because the survey methodology, including the type of questions and women surveyed, varied between NFHS-2 and the subsequent waves, comparisons between NFHS-2 and other waves of NFHS should be interpreted with caution. For the current study, and for purposes of understanding trends over the years, we compared all the available NFHS waves to gain a general understanding of DV prevalence in India and to test Wilson & Daly’s hypothesis, however, differences in the survey methodology prevent direct comparisons of frequencies. As such, statistical analyses were conducted within each wave. Future studies should select datasets with more rigorous

methodology for more accurate analyses. Additionally, DV includes other forms of violence as well such as psychological and economic violence, and not just physical and sexual violence. Research in the future should comprehensively examine DV, including all its various forms. Finally, future research should also focus on investigating associations between demographic variables and DV in other non-WEIRD countries as this research would help to understand how the trends observed in the current study might be specific to Indian culture, or generalizable to other non-WEIRD cultural settings as well.

Conclusion

Here, we investigated if age, residence type, and education levels influenced rates of DV in women in India. Contrary to past evolutionary theory (Wilson & Daly, 1993) and evidence in WEIRD samples (Peters et al., 2002) we found only partial support for the theory that women would be less likely to be the victim of DV as their reproductive value decreases. Instead, we found that older women experienced higher rates of DV than would be expected if age did not influence rates of DV in the later waves of data collection (NFHS-4 and NFHS-5) which spanned from 2015-2021. Understanding the prevalence, causes, and consequences of DV is vital. Women face social, economic, and cultural costs and consequences of DV, including victim blaming, shaming, financial dependency, and ostracism which can impact their health and overall well-being. Understanding culturally relevant risk factors for DV will aid in creating knowledge intervention programs and inform policy decisions that are effectively targeted towards those who are in the greatest need. While this is true for women across the world, it is especially true for women in India, who suffer high rates of DV, poverty, income inequality, and high gender imbalance.

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