

Education and Domestic Violence: Evidence from a School Construction Program in India

Katja Bergonzoli¹

with Madhuri Agarwal², Vikram Bahure³ and Souparna Maji⁴

¹University of Lausanne

²University of Oxford

³King's College London

⁴University of Geneva

FROGEE 2024 Academic Conference
Stockholm School of Economics, 6th December 2024

Motivation (1)

27%

Women have ever suffered domestic violence in the world
(2018).

Motivation (1)

27%

Women have ever suffered domestic violence in the world (2018).

31%

Women in India ever suffered domestic violence according to NFHS4, 2015-16.

Motivation (1)

27%

Women have ever suffered domestic violence in the world (2018).

31%

Women in India ever suffered domestic violence according to NFHS4, 2015-16.

⇒ Essential to understand which policies can prevent domestic violence!

Motivation (2)

- Domestic violence is more prevalent in developing economies where women have weak intra-household bargaining power (WHO, 2013)
- 37% and 31% Indian women between the ages of 15-49 years faced domestic violence according to NFHS 3 (2005-06) and NFHS 4 (2015-16)
- Between 2001-2011 and 2010-2021, the female literacy rate in India increased by 11.3% and 14.4%
- Decades of 1990s and early 2000s witnessed extensive school reform programs in India (e.g., District Primary Education Program (DPEP))
- **The relationship between public education programs and domestic violence against women in India requires further attention**

This Paper

How does DPEP, a large school construction program, affect domestic violence in India?

This Paper

How does DPEP, a large school construction program, affect domestic violence in India?

- How does DPEP affect domestic violence at individual level?

Using NFHS data and fuzzy RDD methodology, we find a decreasing effect

This Paper

How does DPEP, a large school construction program, affect domestic violence in India?

- How does DPEP affect domestic violence at individual level?

Using NFHS data and fuzzy RDD methodology, we find a decreasing effect

- Explore the causal channels that drive the results
 - ① Impact of DPEP on education
 - ② Impact of DPEP on subsequent channels

This Paper

How does DPEP, a large school construction program, affect domestic violence in India?

- How does DPEP affect domestic violence at individual level?

Using NFHS data and fuzzy RDD methodology, we find a decreasing effect

- Explore the causal channels that drive the results
 - ① Impact of DPEP on education
 - ② Impact of DPEP on subsequent channels

The results are driven by

- ▶ ↑ **in women's education**
- ▶ ↑ **in gender attitudes and beliefs**
- ▶ ↑ **partner characteristics**
- ▶ ↑ **access to information for women**
- ▶ Evidence of positive correlation between DPEP and reporting to law enforcement authorities

Literature and Contribution: Summary

| Context | Selected Papers | Our Contribution |
|---|--|--|
| Impact of school construction on socioeconomic outcomes | Khanna (2023), Rohner and Saia (2019), Duflo (2002), Agarwal et al. (2022) | <ul style="list-style-type: none">• First to look at the impact of school construction program on (different types of) domestic violence against women in India. |
| Empirical studies on the potential mechanisms | Sanin (2022), Erten and Keskin (2018), Friedman et al. (2016), Mocan et al. (2012), Aizer (2010) | <ul style="list-style-type: none">• Comprehensive study of how a schooling reform can influence domestic violence addressing both income and non-income channels.• First to look at the access to information and reporting channel |

District Primary Education Program (DPEP)

- One of the largest school construction programs by the govt. of India
- Program's primary objective: Construct primary schools to increase access to primary education and **reduce the gender gap in education**
- **Targeted to districts with poor female primary enrolment**
 - ▶ To be eligible, a district must have an average female literacy rate below the national average of 39.3% in 1991
- Launched between 1994 to 2004 with a staggered implementation at the district level

[DPEP Phases](#)[Timeline](#)

Data

DPEP

- National Institute of Educational Planning and Administration [Timeline](#)
- Implemented in 242 districts; Not implemented in 257 districts; \approx 160,000 schools

Self-reported domestic violence (DV)

[Summary Statistics NFHS](#)

- Questionnaire from DHS/NFHS 4
- Individual-level data for 2015-2016
- 723,875 eligible women aged 15-49; 79,729 women (69.79% rural) were interviewed for the domestic violence questions
- **For treated districts, look only at women who benefit from DPEP, women who were young enough to benefit from the program**

Other datasets

- Census Tract 1991

Areas excluded

- Union territories

Domestic Violence Variables

NFHS Self-reported Individual-Level Analysis

- Emotional domestic violence: ever been humiliated, threatened or insulted
- Less severe domestic violence: ever been pushed, twisted, slapped or punched
- Severe domestic violence: ever been kicked or dragged, strangled or burnt, threatened with knife
- Sexual domestic violence: Ever forced into unwanted sex
- Injuries domestic violence: Ever had bruises, eye injuries, sprains, dislocations, burns, went to doctor due to action, wounds, broken bones
- Binary Responses: Yes (1) or No (0)

Empirical Strategy


Imperfect compliance in the implementation of DPEP \Rightarrow Fuzzy RDD

$$DPEP_{id} = \alpha + \gamma \mathbb{1}[X_d \leq c] + f(X_d) + \epsilon_{id} \text{ for } c - h \leq X_d \leq c + h \quad (1)$$

$$DV_{id} = \beta + \widehat{TFRD} DPEP_{id} + g(X_d) + \epsilon_{id} \text{ for } c - h \leq X_d \leq c + h \quad (2)$$

- Eq. 1: Estimation of the proba. of assignment if the district is eligible
- Eq. 2: Using the predicted proba., estimation of the impact of DPEP on DV
- X_d : Female literacy rate in 1991, c : National avg female literacy in 1991 (39.3%)
- $\mathbb{1}[X_d \leq c]$: Treatment indicator if the district is eligible for DPEP program
- h : Bandwidth (Calonico et al. [2014]¹)
- Standard errors are clustered at the district level
- DV_{id} : Domestic Violence

RD Plots: Strategy

¹Mean square error, triangular Kernel, linear function of degree 1, some bandwidth across both sides of the cut-off \Rightarrow 

RD Validity (1)

Figure 1: Probability of DPEP Treatment

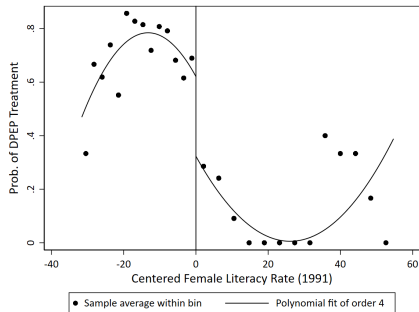
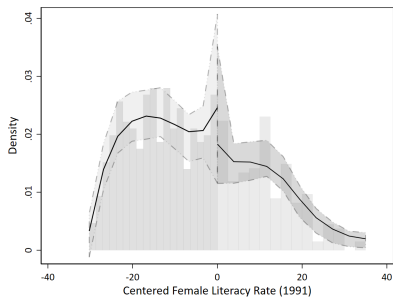


Figure 2: Manipulation Test



- Figure 1: Clear discontinuity in receiving DPEP around the cut-off
- Figure 2: Confidence intervals overlap → no manipulation

RD Validity (2)

Table 1: Balance test covariates for women

| | (1) Sex ratio | (2) %Primary 25-44 | (3) %Married 15-24 | (4) %Married 25-44 | (5) %Main work |
|--------------|---------------------|-----------------------|-----------------------|-----------------------|-------------------|
| Robust | -37.061 [59.878] | 0.016 [0.022] | 0.080 [0.117] | 0.024 [0.048] | -0.137 [0.191] |
| Sample Mean | 928.18 | 0.10 | 0.58 | 0.93 | 0.29 |
| BW districts | 164 | 270 | 202 | 201 | 244 |
| Bandwidth | 10 | 16 | 12 | 12 | 15 |
| VCE method | NN | NN | NN | NN | NN |
| BW type | mserd | mserd | mserd | mserd | mserd |

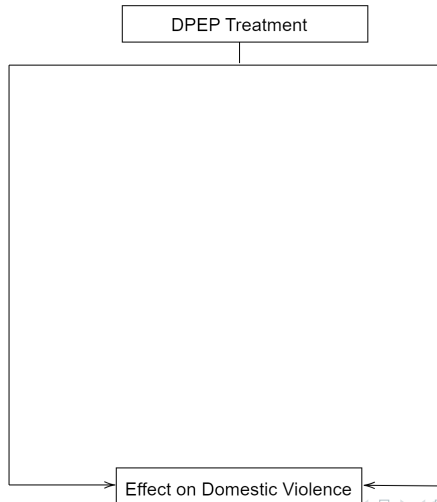
RD Validity (3)

Table 2: Balance test covariates for men

| | (1) Sex ratio | (2) %Primary 25-44 | (3) %Married 15-24 | (4) %Married 25-44 | (5) %Main work |
|--------------|---------------------|-----------------------|-----------------------|-----------------------|-------------------|
| Robust | -37.061 [59.878] | 0.008 [0.043] | 0.077 [0.070] | 0.072 [0.075] | 0.096* [0.050] |
| Sample Mean | 928.18 | 0.15 | 0.24 | 0.85 | 0.81 |
| BW districts | 164 | 180 | 148 | 157 | 157 |
| Bandwidth | 10 | 11 | 9 | 10 | 10 |
| VCE method | NN | NN | NN | NN | NN |
| BW type | mserd | mserd | mserd | mserd | mserd |

Roadmap

Main Specification



Main Result

Local Average Treatment Effect

Table 3: Impact of DPEP on Domestic Violence

| | Any Violence | Emotional | Less severe | Severe | Sexual | Any Injury |
|--------------|--------------------|-------------------|--------------------|-----------------|--------------------|--------------------|
| DPEP | -0.32*** [0.07] | -0.13** [0.05] | -0.26*** [0.06] | -0.04 [0.04] | -0.09*** [0.03] | -0.10*** [0.04] |
| Observations | 40636 | 40636 | 40636 | 40636 | 40636 | 40636 |
| Control Mean | 0.34 | 0.14 | 0.29 | 0.09 | 0.07 | 0.07 |
| BW-left | 7.29 | 6.68 | 8.53 | 6.14 | 9.14 | 6.99 |
| BW-right | 7.29 | 6.68 | 8.53 | 6.14 | 9.14 | 6.99 |
| BW type | mserd | mserd | mserd | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on domestic violence variables. ** $p < 0.05$; *** $p < 0.01$

RD Plots

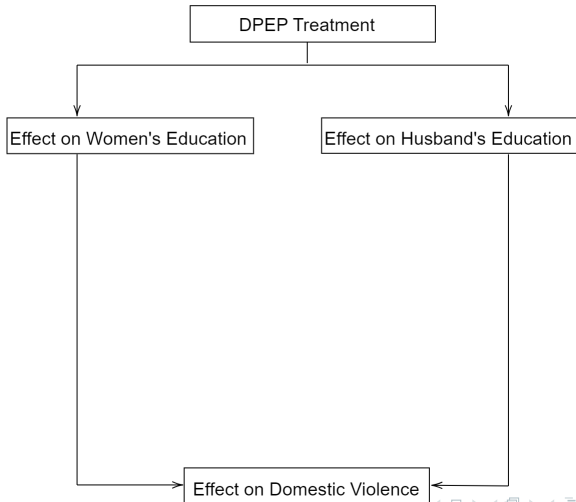
Robustness

Heterogeneity

Educ Effects

Roadmap

Mechanism I



Education

DPEP → Women and their Partners' Education

Table 4: Impact of DPEP on Education of Women and their Partners

| | Years of Schooling | |
|--------------|--------------------|-----------------|
| | Women | Partner/Husband |
| DPEP | 0.93* [0.57] | 0.58 [0.72] |
| Observations | 463992 | 54454 |
| Control Mean | 8.08 | 8.13 |
| BW-left | 4.89 | 5.82 |
| BW-right | 4.89 | 5.82 |
| BW type | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on the number of years of schooling for women and their partners. ** $p < 0.05$, *** $p < 0.01$

Education (2)

Women's Education → Domestic Violence

IV-2SLS (discontinuity around the cut-off):

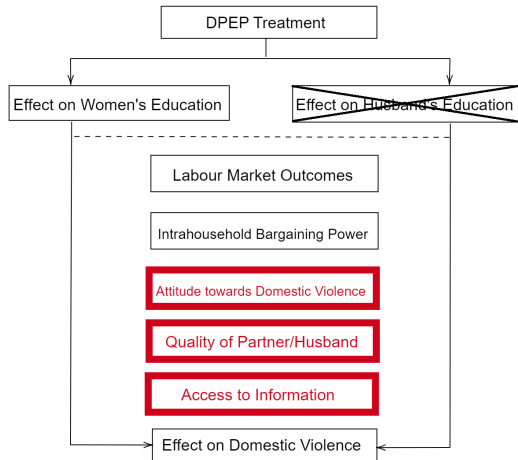
Table 5: Impact of Women's Education on Domestic Violence

| | Any Violence | Emotional | Less severe | Severe | Sexual | Any Injury |
|--------------|-------------------|------------------|-------------------|-----------------|------------------|------------------|
| Education | -0.21** [0.10] | -0.08* [0.05] | -0.19** [0.09] | -0.01 [0.02] | -0.07* [0.04] | -0.06* [0.03] |
| Observations | 8087 | 8087 | 8087 | 8087 | 8087 | 8087 |
| Control Mean | 0.35 | 0.15 | 0.30 | 0.09 | 0.07 | 0.08 |
| CD Fstat | 5.06 | 5.06 | 5.06 | 5.06 | 5.06 | 5.06 |

Notes This table shows the IV estimates the impact of women's education on domestic violence variables. The regressions are run using the mserd BW of 4.93
 ** $p < 0.05$; *** $p < 0.01$

Roadmap

Mechanism II



Causal Channels - Impact of DPEP on Selected Variables

Table 6: Impact of DPEP on Selected Variables

| Variables | Coef. | Std. Err. | Obs. |
|--------------------------------------|----------|-----------|--------|
| <i>Attitude Towards DV (Self)</i> | | | |
| Going out | -0.28*** | [0.07] | 77477 |
| Neglect children | -0.29*** | [0.07] | 77470 |
| Unfaithful | -0.19*** | [0.06] | 77183 |
| Disrespectful | -0.39*** | [0.08] | 7739 |
| <i>Attitude Towards DV (Partner)</i> | | | |
| Going out | -0.17*** | [0.06] | 41016 |
| Neglect children | -0.31*** | [0.06] | 41051 |
| Unfaithful | -0.24*** | [0.06] | 40842 |
| Disrespectful | -0.35*** | [0.08] | 40948 |
| <i>Partner's Other Qualities</i> | | | |
| Not Poor | 0.37*** | [0.08] | 41227 |
| <i>Access to Information</i> | | | |
| Read Newspaper | 0.17*** | [0.05] | 463992 |
| Read Text | 0.13*** | [0.05] | 35564 |

DV: Domestic Violence

Conclusion

- DPEP raises women's education by 0.93 years
- DPEP leads to a 13, 26, and 9 percentage points decrease in emotional, less severe physical, and sexual forms of domestic violence, respectively
- These results stem from improved gender attitudes and beliefs, better partner quality, and more access to information for more educated women
- We find no impact on women's labor force participation, income, or decision-making power
- We find some evidence of a positive correlation between implementing DPEP and reporting to law enforcement authorities/seeking help from formal institutions

Thank you for your attention!

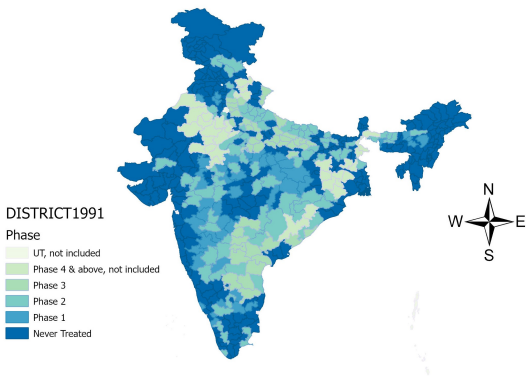
Kindly share your comments and feedback:

katja.bergonzoli@unil.ch



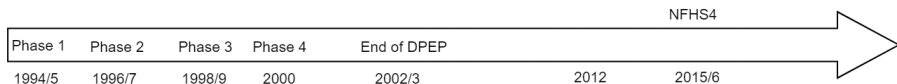
Map: DPEP Implementation

Figure 3: DPEP Districts: Phase-wise



return

Timeline



- DPEP implementation: Implemented in 242 districts across 18 states
 - ▶ Phase 1 (1994 to 2002/3): 47 districts
 - ▶ Phase 2 (1996/7 to 2002/3): 87 districts
 - ▶ Phase 3 (1998/9 to 2003): 38 districts
 - ▶ Phase 4 (2000-2004): 70 districts
 - ▶ Not implemented in 257 districts

- NFHS 2015-16:
 - ▶ For treated districts, look only at women who benefit from DPEP, women who were young enough to benefit from the program

Summary Statistics: Main (3)

Individual-Level Analysis

| | Mean | SD | Min | Max | N |
|------------------------------|------|------|-----|-----|---------|
| NFHS, 2015-16 | | | | | |
| <i>Decision</i> | | | | | |
| Own Health | 0.10 | 0.30 | 0 | 1 | 63,502 |
| HH Purchases | 0.04 | 0.20 | 0 | 1 | 59,571 |
| Own Earnings | 0.18 | 0.38 | 0 | 1 | 13,520 |
| Husband/Partner Earnings | 0.04 | 0.19 | 0 | 1 | 59,064 |
| Own Contraception | 0.08 | 0.27 | 0 | 1 | 172,514 |
| | | | | | |
| <i>Women Gender Attitude</i> | | | | | |
| Going Out | 0.23 | 0.42 | 0 | 1 | 94,662 |
| Neglect Children | 0.29 | 0.45 | 0 | 1 | 94,654 |
| Argue | 0.26 | 0.44 | 0 | 1 | 94,370 |
| Refuse Sex | 0.13 | 0.33 | 0 | 1 | 93,454 |
| Not Cooking | 0.17 | 0.38 | 0 | 1 | 94,739 |
| Unfaithful | 0.23 | 0.42 | 0 | 1 | 94,303 |
| Disrespect | 0.35 | 0.48 | 0 | 1 | 94,487 |

Summary Statistics: Main (4)

Individual-Level Analysis

| | Mean | SD | Min | Max | N |
|--|------|------|-----|-----|--------|
| NFHS, 2015-16 | | | | | |
| <i>Husband/Partner's Gender Attitude</i> | | | | | |
| Husband: Going Out | 0.15 | 0.35 | 0 | 1 | 49,681 |
| Husband: Neglect Children | 0.18 | 0.38 | 0 | 1 | 49,699 |
| Husband: Argue | 0.19 | 0.39 | 0 | 1 | 49,604 |
| Husband: Refuse Sex | 0.08 | 0.26 | 0 | 1 | 49,561 |
| Husband: Not Cooking | 0.09 | 0.29 | 0 | 1 | 49,731 |
| Husband: Unfaithful | 0.21 | 0.41 | 0 | 1 | 49,465 |
| Husband: Disrespect | 0.27 | 0.44 | 0 | 1 | 49,558 |
| <i>Husband/Partner's Quality</i> | | | | | |
| Husband/Partner's Employed | 0.91 | 0.28 | 0 | 1 | 49,924 |
| Husband/Partner's Educ. | 8.00 | 4.86 | 0 | 20 | 66,006 |
| Husband/Partner Alcohol Abuse | 1.69 | 0.58 | 0 | 2 | 15,506 |
| Husband/Partner 'Not Poor' | 0.61 | 0.49 | 0 | 1 | 49,925 |

return

Summary Statistics: Main (5)

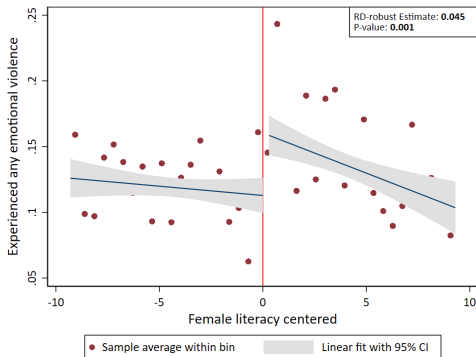
Individual-Level Analysis

| | Mean | SD | Min | Max | N |
|----------------------|------|------|-----|-----|---------|
| NFHS, 2015-16 | | | | | |
| <i>Information</i> | | | | | |
| Read Newspaper | 0.42 | 0.49 | 0 | 1 | 549,007 |
| Financial Knowledge | 0.51 | 0.50 | 0 | 1 | 95,962 |
| Business Information | 0.37 | 0.48 | 0 | 1 | 95,962 |
| Use Mobile Phone | 0.47 | 0.50 | 0 | 1 | 95,962 |
| Read Mobile Text | 0.75 | 0.43 | 0 | 1 | 44,105 |
| <i>Seek Help</i> | | | | | |
| Social Service | 0.00 | 0.03 | 0 | 1 | 18,039 |
| Police | 0.01 | 0.07 | 0 | 1 | 18,039 |
| Religious Leader | 0.00 | 0.04 | 0 | 1 | 18,039 |
| Lawyer | 0.00 | 0.04 | 0 | 1 | 18,039 |
| District ID | | | 1 | 638 | 549,007 |
| State ID | | | 1 | 35 | 549,007 |

Policy Impact (1)

RD Plots

Figure 4: Effect of DPEP on Women Experiencing Any Emotional Violence

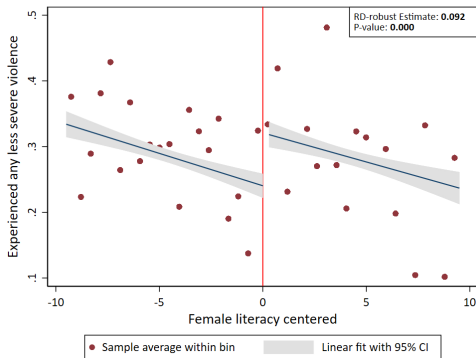


return

Policy Impact (2)

RD Plots

Figure 5: Effect of DPEP on Women Experiencing Less Severe Violence

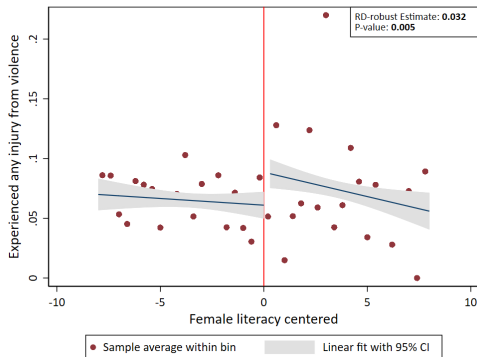


return

Policy Impact (3)

RD Plots

Figure 6: Effect of DPEP on Women Experiencing Any Injury

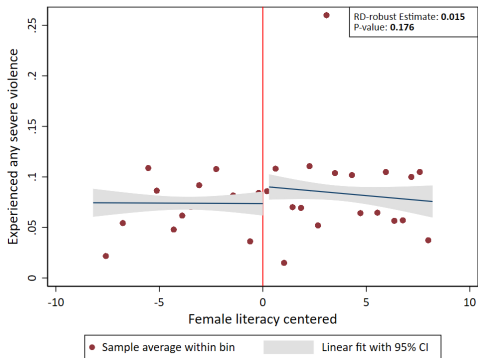


return

Policy Impact (4)

RD Plots

Figure 7: Effect of DPEP on Women Experiencing Severe Violence

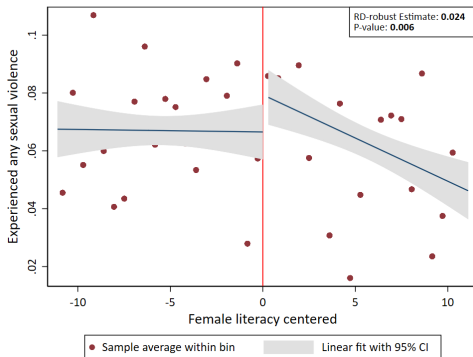


return

Policy Impact (5)

RD Plots

Figure 8: Effect of DPEP on Women Experiencing Physical Violence



return

Robustness (1)

Persistence

Persistence in Policy Impact on Self-reported Domestic Violence:

Table 7: Impact of DPEP on Domestic violence (NFHS5, 2019-21)

| | (1) Emotional | (2) Less Severe | (3) Severe | (4) Sexual | (5) Injuries |
|----------------|------------------|--------------------|-------------------|-------------------|-----------------|
| DPEP | -0.07* [0.04] | 0.05 [0.09] | -0.13** [0.06] | -0.09** [0.05] | -0.00 [0.06] |
| Observations | 20285 | 20285 | 20285 | 20285 | 20285 |
| Control Mean | 0.12 | 0.23 | 0.07 | 0.05 | 0.06 |
| Bandwidth (BW) | 2.06 | 2.84 | 3.58 | 2.44 | 3.95 |
| BW-type | mserd | mserd | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on domestic violence variables using the NFHS-5 survey round (2019-21). ** $p < 0.05$, *** $p < 0.01$

Robustness (2)

Sensitivity Analysis (1)

Excluding phase 4

Table 8: Impact of DPEP on Domestic Violence

| | Any Violence | Emotional | Less severe | Severe | Sexual | Any Injury |
|--------------|--------------------|-------------------|--------------------|-----------------|--------------------|-------------------|
| DPEP | -0.33*** [0.07] | -0.10** [0.05] | -0.30*** [0.07] | -0.04 [0.04] | -0.10*** [0.03] | -0.10** [0.04] |
| Observations | 40040 | 40040 | 40040 | 40040 | 40040 | 40040 |
| Control Mean | 0.34 | 0.15 | 0.30 | 0.09 | 0.07 | 0.08 |
| BW-left | 5.67 | 5.66 | 6.14 | 5.41 | 7.50 | 5.80 |
| BW-right | 5.67 | 5.66 | 6.14 | 5.41 | 7.50 | 5.80 |
| BW type | mserd | mserd | mserd | mserd | mserd | mserd |

Notes Table presents Fuzzy RD estimates of DPEP's impact on domestic violence, excluding districts with potential SSA confounding by focusing on pre-2002 DPEP implementations. ** $p < 0.05$; *** $p < 0.01$

Robustness (3)

Sensitivity Analysis (2)

Different bandwidths for the two sides of the cutoff

Table 9: Impact of DPEP on Domestic Violence

| | Any Violence | Emotional | Less severe | Severe | Sexual | Any Injury |
|--------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| DPEP | -0.24*** [0.04] | -0.10*** [0.03] | -0.22*** [0.05] | -0.05** [0.02] | -0.09*** [0.02] | -0.07*** [0.03] |
| Observations | 40636 | 40636 | 40636 | 40636 | 40636 | 40636 |
| Control Mean | 0.35 | 0.15 | 0.30 | 0.09 | 0.07 | 0.08 |
| BW-left | 3.63 | 4.78 | 3.93 | 5.24 | 4.53 | 5.17 |
| BW-right | 10.65 | 11.49 | 7.43 | 11.08 | 9.07 | 10.57 |
| BW type | msetwo | msetwo | msetwo | msetwo | msetwo | msetwo |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on domestic violence variables. ** $p < 0.05$; *** $p < 0.01$

return

Robustness (4)

Sensitivity Analysis (3)

Using a polynomial of order 2

Table 10: Impact of DPEP on Domestic Violence

| | Any Violence | Emotional | Less severe | Severe | Sexual | Any Injury |
|--------------|--------------------|-----------------|--------------------|-----------------|--------------------|-------------------|
| DPEP | -0.33*** [0.10] | -0.07 [0.07] | -0.32*** [0.10] | -0.05 [0.05] | -0.17*** [0.05] | -0.12** [0.05] |
| Observations | 40636 | 40636 | 40636 | 40636 | 40636 | 40636 |
| Control Mean | 0.34 | 0.14 | 0.29 | 0.08 | 0.07 | 0.07 |
| BW-left | 6.39 | 6.98 | 6.75 | 8.90 | 8.90 | 9.12 |
| BW-right | 6.39 | 6.98 | 6.75 | 8.90 | 8.90 | 9.12 |
| BW type | mserd | mserd | mserd | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on domestic violence variables. ** $p < 0.05$; *** $p < 0.01$

return

Robustness (5)

Sensitivity Analysis (4)

Using a uniform Kernel

Table 11: Impact of DPEP on Domestic Violence

| | Any Violence | Emotional | Less severe | Severe | Sexual | Any Injury |
|--------------|--------------------|--------------------|--------------------|-----------------|-------------------|--------------------|
| DPEP | -0.26*** [0.05] | -0.14*** [0.04] | -0.23*** [0.05] | -0.05 [0.04] | -0.07** [0.03] | -0.07*** [0.03] |
| Observations | 40636 | 40636 | 40636 | 40636 | 40636 | 40636 |
| Control Mean | 0.34 | 0.14 | 0.29 | 0.09 | 0.07 | 0.07 |
| BW-left | 7.20 | 7.46 | 7.12 | 6.00 | 7.73 | 6.91 |
| BW-right | 7.20 | 7.46 | 7.12 | 6.00 | 7.73 | 6.91 |
| BW type | mserd | mserd | mserd | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on domestic violence variables. ** $p < 0.05$; *** $p < 0.01$

return

Mechanisms

Empirical Strategy

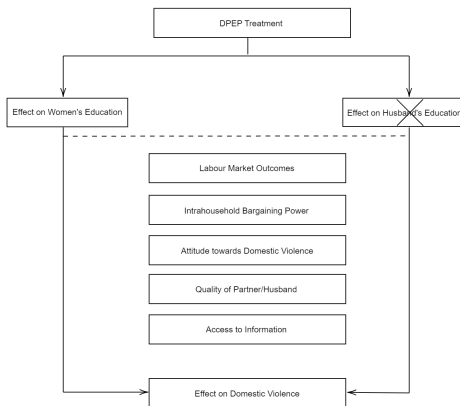
IV-2SLS (discontinuity around the cut-off):

$$Educ_{id} = \alpha + \gamma \mathbb{1}[X_d \leq c] + f(X_d) + \epsilon_{id} \text{ for } c - h \leq X_d \leq c + h \quad (4)$$

$$DV_{id} = \beta + \tau_{IV} \widehat{Educ}_{id} + g(X_d) + \epsilon_{id} \text{ for } c - h \leq X_d \leq c + h \quad (5)$$

- X_d : Female literacy rate in 1991
- c : National average female literacy cut-off (39.3% at 1991)
- $\mathbb{1}[X_d \leq c]$: Treatment indicator if the district is eligible for DPEP program
- h : Bandwidth
- Standard errors are clustered at the district level
- $Educ_{id}$: Education (number of years of schooling)
- DV_{id} : Domestic Violence

Roadmap



return

Models on Domestic Violence for Income/Economics Channel - Theories

Table 12: Summary of Relevant Studies

| Theory | Concept | Relevant Studies |
|---|---|--|
| Household Bargaining and Outside Options | ↑ woman relative income/↑ woman working outside ⇒ ↑ her intra-hh bargaining power ⇒ ↓ threat of DV since less dependent | Aizer (2010), Tauchen et al. (1991), Haushofer et al. (2019) |
| Expressive Violence | ↑ income ⇒ ↓ husband financial stress ⇒ ↓ DV | Tauchen et al. (1991), Angelucci (2008) |
| Exposure Reduction | ↑ woman work ⇒ ↓ time couple spent together ⇒ ↓ DV | Criminologist Theory (Dugan et al., 1999) |
| Instrumental Violence and Resource Extraction | ↑ woman income ⇒ ↑ things to extract ⇒ ↑ DV | Criminologist Theory (Bloch and Rao (2002), Anderson and Genicot (2015)) |
| Male Backlash | ↑ women's economic empowerment ⇒ ↑ feeling threatened ⇒ ↑ DV | Sociologist Theory (Macmillan and Gartner (1999)) |

Models on Domestic Violence

Table 13: Summary of Relevant Studies

| Concept | Relevant Studies |
|---|--|
| Household Bargaining and Outside Options | Aizer (2010), Tauchen et al. (1991), Haushofer et al. (2019) |
| Expressive Violence | Tauchen et al. (1991), Angelucci (2008) |
| Exposure Reduction | Criminologist Theory (Dugan et al., 1999) |
| Instrumental Violence and Resource Extraction | Bloch and Rao (2002), Anderson and Genicot (2015) |
| Male Backlash | Sociologist Theory (Macmillan and Gartner (1999)) |

return

Causal Channels (1/2)

- **Labour market outcomes**
 - ▶ DPEP: No impact on employment; ↓ cash income.
 - ▶ Women's Educ.: ↓ effect on employment.
- **Women's intrahousehold bargaining power**
 - ▶ DPEP: No impact on earnings decision; ↓ decision on big HH purchases, husband's earnings.
 - ▶ Women's Educ.: ↓ decision-making on big HH purchases and husband's earnings.

Notes:

- DPEP: Impact of DPEP on the variable to understand the causal channel.
- Women's Educ: Effect of women's education on the variables.

Causal Channels (2/2)

- **Women's attitudes towards domestic violence**
 - ▶ DPEP and Women's Educ.: ↓ in the likelihood of women justifying violence by the husband/partner under different circumstances
⇒ Women are likely to be less tolerant of domestic violence and deterrence.

- **Quality of husband or partner**
 - ▶ DPEP: No impact on husband's education.
 - ▶ Women's Educ.: ↑ on husband's education.
 - ▶ DPEP and Women's Educ.: ↓ in the likelihood of partner justifying domestic violence; ↑ husband is wealthier.

- **Access to information**
 - ▶ DPEP and Women's Educ.: ↑ read newspaper; using mobile to send texts.
 - ▶ Women's Educ.: ↑ bank savings account.

Return

Impact of DPEP on Selected Variables

Effect of Women's Education on Selected Variables

Impact of DPEP

Effect of Women's Education

Causal Channels (1)

Conceptual Framework: Labour Market Outcomes

Table 14: Labour Market Outcomes and Domestic Violence

| Variable | Relationship with Domestic Violence: Theoretical Predictions | | | | |
|------------------------|---|--------------------------|------------------------|-----------------------|-------------------------|
| | Outside Options and Bargaining | Instrumental Violence | Expressive Violence | Exposure Reduction | Reporting Likelihood |
| <i>Employed</i> | (-) | n/a | n/a | (-) | (-) |
| <i>Working Outside</i> | (-) | n/a | n/a | (-) | (-) |
| <i>Cash Income</i> | (-) | (+) | (-) | n/a | (-) |

return

Causal Channels (2)

Conceptual Framework: Intrahousehold Decision-making

Table 15: Intrahousehold Bargaining and Domestic Violence

| <i>Variable</i> | <i>Relationship with Domestic Violence: Theoretical Predictions</i> | | | |
|---------------------------|---|----------------------------------|--------------------------------|-------------------------------|
| | <i>Outside Options and Bargaining</i> | <i>Instrumental Violence</i> | <i>Expressive Violence</i> | <i>Exposure Reduction</i> |
| <i>Own Health</i> | (-) | n/a | n/a | n/a |
| <i>HH Purchases</i> | (-) | n/a | n/a | n/a |
| <i>Own Earnings</i> | (-) | n/a | n/a | n/a |
| <i>Husband's Earnings</i> | (-) | n/a | n/a | n/a |
| <i>Own Contraception</i> | (-) | n/a | n/a | n/a |

return

Causal Channels (3)

Conceptual Framework: Attitude Towards Domestic Violence

Table 16: Domestic Violence Attitudes of Women and Husband/Partner and Domestic Violence

| <i>Variable</i> | <i>Relationship with Domestic Violence: Theoretical Predictions</i> | | |
|-------------------------------------|---|--------------------------------|---------------------------------|
| | <i>Attitude towards Violence</i> | <i>Gender Role Beliefs</i> | <i>Reporting Likelihood</i> |
| <i>Justify DV: Going Out</i> | (+) | (+) | (+) |
| <i>Justify DV: Neglect Children</i> | (+) | (+) | (+) |
| <i>Justify DV: Argue</i> | (+) | (+) | (+) |
| <i>Justify DV: Refuse Sex</i> | (+) | (+) | (+) |
| <i>Justify DV: Not Cooking</i> | (+) | (+) | (+) |
| <i>Justify DV: Unfaithful</i> | (+) | (+) | (+) |
| <i>Justify DV: Disrespect</i> | (+) | (+) | (+) |

return

Causal Channels (4)

Conceptual Framework: Quality of Partner

Table 17: Quality of Husband/Partner and Domestic Violence

| Variable | Relationship with Domestic Violence: Theoretical Predictions | | | | |
|--|--|---------------------|--------------------|-------------------|---------------------|
| | Instrumental Violence | Expressive Violence | Exposure Reduction | Violence Attitude | Gender Role Beliefs |
| <i>Husband/Partner Employed</i> | n/a | (-) | (-) | n/a | n/a |
| <i>Husband/Partner's Educ.</i> | n/a | n/a | n/a | (+/-) | (+/-) |
| <i>Husband/Partner's Alcohol Abuse</i> | n/a | n/a | n/a | (+) | n/a |

return

Causal Channels (5)

Conceptual Framework: Access to Information and Seeking Help

Table 18: Access to Information, Seeking Help, and Domestic Violence

| Question/Variable | Relationship with Domestic Violence: Theoretical Predictions | | |
|------------------------------------|---|---------------------|----------------------|
| | Violence Attitude | Gender Role Beliefs | Reporting Likelihood |
| <i>Read Newspaper</i> | n/a | n/a | (+) |
| <i>Financial Knowledge</i> | n/a | n/a | (+) |
| <i>Business Information</i> | n/a | n/a | (+) |
| <i>Use Mobile Phone</i> | n/a | n/a | (+) |
| <i>Read Mobile Text</i> | n/a | n/a | (+) |
| <i>Seek Help: Social Service</i> | n/a | n/a | (+/-) |
| <i>Seek Help: Religious Leader</i> | n/a | n/a | (+/-) |
| <i>Seek Help: Police</i> | n/a | n/a | (+) |
| <i>Seek Help: Lawyer</i> | n/a | n/a | (+) |

return

Causal Channels (6)

Empirical Strategy

Impact of DPEP on Variables of Interest (Fuzzy RDD)

$$DPEP_{id} = \alpha + \gamma \mathbb{1}[X_d \leq c] + f(X_d) + \epsilon_{id} \text{ for } c - h_l \leq X_d \leq c + h_r \quad (6)$$

$$Y_{id} = \beta + \tau_{FRD} \widehat{DPEP}_{id} + g(X_d) + \epsilon_{id} \text{ for } c - h \leq X_d \leq c + h \quad (7)$$

Effect of Women's Education (IV-2SLS (discontinuity around the cut-off))

$$Educ_{id} = \alpha + \gamma \mathbb{1}[X_d \leq c] + f(X_d) + \epsilon_{id} \text{ for } c - h \leq X_d \leq c + h \quad (8)$$

$$Y_{id} = \beta + \tau_{IV} \widehat{Educ}_{id} + g(X_d) + \epsilon_{id} \text{ for } c - h \leq X_d \leq c + h \quad (9)$$

return

Causal Channels (7)

DPEP → Labour Market Outcomes

Table 19: Impact of DPEP on Labour Market Outcomes

| | Employed | Working Outside | Cash Income |
|--------------|-----------------|-----------------|-------------------|
| DPEP | -0.08 [0.05] | 0.01 [0.09] | -0.30** [0.13] |
| Observations | 78518 | 22285 | 22285 |
| Control Mean | 0.22 | 0.21 | 0.85 |
| BW-left | 8.83 | 7.85 | 5.67 |
| BW-right | 8.83 | 7.85 | 5.67 |
| BW type | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on female labor market outcomes.

** $p < 0.05$; *** $p < 0.01$

Causal Channels (8)

Education → Labour Market Outcomes

Table 20: Impact of Women’s Education on Labor Market Outcomes

| | Employed | Working Outside | Cash Income |
|--------------|-----------------|-----------------|------------------|
| Education | -0.03 [0.02] | -0.01 [0.04] | -0.11* [0.06] |
| Observations | 15444 | 4450 | 4450 |
| Control Mean | 0.23 | 0.22 | 0.84 |
| CD Fstat | 30.66 | 5.52 | 5.52 |

Notes This table shows the IV estimates the impact of women’s education on labor market variables. The regressions are run using the mserd BW of 4.93
 p<0.05;*p<0.01

return

Causal Channels (9)

DPEP → Intrahousehold Bargaining

Table 21: Impact of DPEP on Women's Intrahousehold Bargaining Power

| | Own Health | HH Purchases | Own Earnings | Husband's Earnings | Own Contraception |
|--------------|-----------------|-------------------|-----------------|--------------------|--------------------|
| DPEP | -0.07 [0.04] | -0.06** [0.02] | -0.01 [0.15] | -0.06** [0.03] | -0.09*** [0.03] |
| Observations | 52344 | 49053 | 11361 | 48662 | 146220 |
| Control Mean | 0.10 | 0.04 | 0.20 | 0.05 | 0.09 |
| BW-left | 7.49 | 8.54 | 6.60 | 7.92 | 6.77 |
| BW-right | 7.49 | 8.54 | 6.60 | 7.92 | 6.77 |
| BW type | mserd | mserd | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on female intrahousehold bargaining power. **p<0.05,***p<0.01

return

Causal Channels (10)

Education → Intrahousehold Bargaining

Table 22: Impact of Women's Education on Intrahousehold Bargaining

| | Own Health | HH Purchases | Own Earnings | Husband's Earnings | Own Contraception |
|--------------|-----------------|------------------|-----------------|--------------------|-------------------|
| Education | -0.02 [0.02] | -0.02* [0.01] | -0.11 [0.38] | -0.03* [0.01] | -0.24 [0.33] |
| Observations | 10316 | 9652 | 2435 | 9621 | 32138 |
| Control Mean | 0.11 | 0.05 | 0.22 | 0.05 | 0.09 |
| CD Fstat | 12.83 | 11.94 | 0.12 | 10.54 | 0.57 |

Notes This table shows the IV estimates the impact of women's education on intrahousehold bargaining power of women. The regressions are run using the mserd BW of 4.93 **p<0.05,***p<0.01

return

Causal Channels (11)

DPEP → Women's Attitude towards Domestic Violence

Table 23: Impact of DPEP on Women's Attitudes towards Domestic Violence

| | Going out | Neglect children | Argues | Refuse sex | Not cooking | Unfaithful | Disrespectful |
|--------------|--------------------|--------------------|-----------------|-----------------|-----------------|--------------------|--------------------|
| DPEP | -0.28*** [0.07] | -0.29*** [0.07] | -0.10 [0.06] | -0.05 [0.05] | -0.04 [0.05] | -0.19*** [0.06] | -0.39*** [0.08] |
| Observations | 77477 | 77470 | 77266 | 76548 | 77536 | 77183 | 77339 |
| Control Mean | 0.27 | 0.33 | 0.28 | 0.14 | 0.19 | 0.22 | 0.37 |
| BW-left | 6.23 | 6.70 | 5.17 | 5.20 | 5.31 | 5.00 | 5.62 |
| BW-right | 6.23 | 6.70 | 5.17 | 5.20 | 5.31 | 5.00 | 5.62 |
| BW type | mserd | mserd | mserd | mserd | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on women's attitudes towards justifying domestic violence. **p<0.05,***p<0.01

return

Causal Channels (12)

Education → Women's Attitude towards Domestic Violence

Table 24: Impact of Women's Education on Attitudes towards Domestic Violence

| | Going out | Neglect children | Argues | Refuse sex | Not cooking | Unfaithful | Disrespectful |
|--------------|--------------------|--------------------|-----------------|-----------------|-----------------|--------------------|--------------------|
| Education | -0.09*** [0.02] | -0.09*** [0.02] | -0.02 [0.02] | -0.02 [0.01] | -0.02 [0.02] | -0.06*** [0.02] | -0.10*** [0.03] |
| Observations | 15239 | 15219 | 15182 | 15048 | 15232 | 15161 | 15210 |
| Control Mean | 0.27 | 0.33 | 0.28 | 0.14 | 0.19 | 0.22 | 0.36 |
| CD Fstat | 27.83 | 26.61 | 28.32 | 25.88 | 26.00 | 26.74 | 27.87 |

Notes This table shows the IV estimates the impact of women's education on their attitude towards domestic violence. The regressions are run using the msrd BW of 4.93 **p<0.05;***p<0.01

return

Causal Channels (13)

DPEP → Husband/Partner's Attitude towards Domestic Violence

Table 25: Impact of DPEP on Husband/Partner's Attitude towards Domestic Violence

| | Going out | Neglect children | Argues | Refuse sex | Not cooking | Unfaithful | Disrespectful |
|--------------|--------------------|--------------------|--------------------|--------------------|-----------------|--------------------|--------------------|
| DPEP | -0.17*** [0.06] | -0.31*** [0.06] | -0.16*** [0.05] | -0.18*** [0.05] | -0.02 [0.06] | -0.24*** [0.06] | -0.35*** [0.08] |
| Observations | 41016 | 41051 | 40986 | 40920 | 41086 | 40842 | 40948 |
| Control Mean | 0.16 | 0.21 | 0.19 | 0.09 | 0.12 | 0.24 | 0.30 |
| BW-left | 6.77 | 8.14 | 11.86 | 7.21 | 4.99 | 9.61 | 6.75 |
| BW-right | 6.77 | 8.14 | 11.86 | 7.21 | 4.99 | 9.61 | 6.75 |
| BW type | mserd | mserd | mserd | mserd | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on on husband/partner's attitudes towards justifying domestic violence. **p<0.05;*** p<0.01

[return](#)

Causal Channels (14)

Education → Husband/Partner's Attitude towards Domestic Violence

Table 26: Impact of Women's Education on Husband's Attitude towards Domestic Violence

| | Going out | Neglect children | Argues | Refuse sex | Not cooking | Unfaithful | Disrespectful |
|--------------|------------------|--------------------|-------------------|--------------------|----------------|-------------------|-------------------|
| Education | -0.03* [0.02] | -0.07*** [0.02] | -0.04** [0.02] | -0.05*** [0.02] | 0.00 [0.01] | -0.05** [0.02] | -0.06** [0.02] |
| Observations | 8427 | 8448 | 8435 | 8412 | 8455 | 8409 | 8438 |
| Control Mean | 0.17 | 0.23 | 0.21 | 0.10 | 0.12 | 0.25 | 0.32 |
| CD Fstat | 23.09 | 22.65 | 22.24 | 22.04 | 21.91 | 23.51 | 21.92 |

Notes This table shows the IV estimates the impact of women's education husband's attitude towards domestic violence. The regressions are run using the msrd BW of 4.93 **p<0.05;***p<0.01

return

Causal Channels (15)

DPEP → Husband/Partner's Other Qualities

Table 27: Impact of DPEP on Husband/Partner's Characteristics

| | Employed | Educ. | Non Poor | Alcohol Abuse |
|--------------|-----------------|----------------|-------------------|--------------------|
| DPEP | -0.01 [0.04] | 0.58 [0.72] | 0.37*** [0.08] | -0.00*** [0.00] |
| Observations | 41226 | 54454 | 41227 | 2446 |
| Control Mean | 0.95 | 8.13 | 0.67 | 1.00 |
| BW-left | 5.10 | 5.82 | 5.54 | 2.68 |
| BW-right | 5.10 | 5.82 | 5.54 | 2.68 |
| BW type | mserd | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on husband/partner's quality attributes.

** $p < 0.05$; *** $p < 0.01$

Causal Channels (16)

Education → Husband/Partner's Other Qualities

Table 28: Impact of Women's Education on Husband/Partner's Quality

| | Employed | Men's Education | Non Poor | Alcohol Abuse |
|-------------------|-----------------|------------------|-------------------|-----------------|
| Women's Education | -0.01 [0.01] | 0.49** [0.20] | 0.07*** [0.02] | -0.00 [0.00] |
| Observations | 8494 | 10721 | 8494 | 524 |
| Control Mean | 0.95 | 8.27 | 0.68 | 1.00 |
| CD Fstat | 23.04 | 13.69 | 23.04 | 0.47 |

Notes This table shows the IV estimates the impact of women's education on husband/partner's other attributes of quality. The regressions are run using the mserd BW of 4.93. ** $p < 0.05$; *** $p < 0.01$

return

Causal Channels (17)

DPEP → Access to Information

Table 29: Impact of DPEP on Access to Information

| | Read Newspaper | Financial Knowledge | Business Information | Use Mobile | Read Text |
|--------------|-------------------|---------------------|----------------------|----------------|-------------------|
| DPEP | 0.17*** [0.05] | 0.07 [0.06] | -0.52*** [0.11] | 0.02 [0.06] | 0.13*** [0.05] |
| Observations | 463992 | 78518 | 78518 | 78518 | 35564 |
| Control Mean | 0.44 | 0.52 | 0.43 | 0.50 | 0.77 |
| BW-left | 3.85 | 7.63 | 4.16 | 10.59 | 8.73 |
| BW-right | 3.85 | 7.63 | 4.16 | 10.59 | 8.73 |
| BW type | mserd | mserd | mserd | mserd | mserd |

Notes This table shows the Fuzzy RD-robust estimates of the impact of DPEP on access to mediums of information. **p<0.05; ***p<0.01

return

Causal Channels (18)

Education → Access to Information

Table 30: Impact of Women's Education on Access to Information

| | Read Newspaper | Financial Knowledge | Business Information | Use Mobile | Read Text |
|--------------|-------------------|---------------------|----------------------|----------------|-------------------|
| Education | 0.08*** [0.01] | 0.06*** [0.02] | -0.10*** [0.03] | 0.01 [0.02] | 0.07*** [0.02] |
| Observations | 92717 | 15444 | 15444 | 15444 | 7351 |
| Control Mean | 0.45 | 0.52 | 0.43 | 0.50 | 0.76 |
| CD Fstat | 76.62 | 30.66 | 30.66 | 30.66 | 16.69 |

Notes This table shows the IV estimates the impact of women's education on access to information. The regressions are run using the mserd BW of 4.93. **p<0.05;***p<0.01

return

Causal Channels (19)

DPEP → Likelihood of Seeking Help

Table 31: Impact of Women's education on Seeking Help

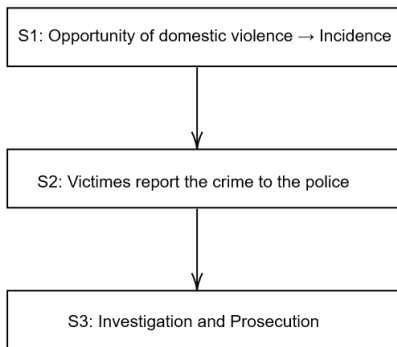
| | Social Service | Religious Leader | Police | Lawyer |
|--------------|-----------------|------------------|----------------|----------------|
| Education | -0.01 [0.03] | -0.00 [0.02] | 0.01 [0.05] | 0.02 [0.04] |
| Observations | 2982 | 2982 | 2982 | 2982 |
| Control Mean | 0.00 | 0.00 | 0.01 | 0.00 |
| CD Fstat | 0.31 | 0.31 | 0.31 | 0.31 |

Notes This table shows the IV estimates the impact of women's education seeking help from institutional and non-institutional support. The regressions are run using the mserd BW of 4.93.

** $p < 0.05$; *** $p < 0.01$

return

Theoretical Framework: Reporting vs Incidence



- DPEP ⇒ ↑ Likelihood Reporting → ↑ Cost of Committing DV for Spouse ⇒ ↓ Domestic Violence

Reporting to Official Authorities

Table 32: Impact of Women’s education on Seeking Help

| | Social Service | Religious Leader | Police | Lawyer |
|--------------|-----------------|------------------|----------------|----------------|
| Education | -0.01 [0.03] | -0.00 [0.02] | 0.01 [0.05] | 0.02 [0.04] |
| Observations | 2982 | 2982 | 2982 | 2982 |
| Control Mean | 0.00 | 0.00 | 0.01 | 0.00 |
| CD Fstat | 0.31 | 0.31 | 0.31 | 0.31 |

Notes This table shows the IV estimates the impact of women’s education seeking help from institutional and non-institutional support. The regressions are run using the mserd BW of 4.93.
 ** $p < 0.05$; *** $p < 0.01$

NCRB dataset: Reporting vs Incidence

Table 33: Impact of DPEP on Reported Domestic Violence (NCRB)

| | (1) DV (2013-16) | (2) DV (2013-19) |
|----------------|---------------------|---------------------|
| DPEP | 1.31 [0.83] | 1.07** [0.52] |
| Observations | 1392 | 2441 |
| Control Mean | 0.70 | 0.65 |
| Bandwidth (BW) | 5.47 | 4.80 |
| BW-type | mserd | mserd |

We estimate the effect by fuzzy RDD. DV: Domestic Violence reported to police according to FIRs (collected from NCRB). * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

[Return Conclusion](#)

[Return Regressions](#)

[Theoretical Framework](#)