



Tuition-free secondary education and women's attitudes toward intimate partner violence: Evidence from Sub-Saharan Africa

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ABSTRACT

Intimate partner violence against women (IPVAW) is devastatingly common around the world. It rose further during the pandemic, increasing the urgency of finding interventions to prevent IPVAW and supporting women's ability to exit violent situations. Interventions that prevent violence and eliminate views among perpetrators that violence is acceptable should be top priority. It is also critical to study women's attitudes toward IPVAW as these shape women's responses to the abuse and their exit options. Moreover, research shows that these attitudes have a direct impact on women's health outcomes. We examine the effect of tuition-free secondary education on women's attitudes toward IPVAW across 29 Sub-Saharan African countries using data from the Demographic and Health Surveys conducted between 2000 and 2019. Using the difference-in-difference-in-differences strategy, we estimate the change in women's attitudes toward IPVAW in countries that implement tuition-free secondary policy compared with countries with tuition-free primary alone and those without any tuition-free policy during the study period. We find that while tuition-free primary education policy alone did not reduce the probability of IPVAW being perceived as justified, tuition-free secondary reduced it significantly. The probability that IPVAW was perceived as justified under at least one circumstance declined by 5.3 percentage points more on average in countries that adopted tuition-free policy up to the secondary level relative to those that adopted only up to the primary level. Tuition-free secondary affects four of the five circumstances under which IPVAW was perceived as justified — if she goes out without telling the husband, argues with him, neglects children or refuses sex. We observed no declines for when she burns food, suggesting different factors affecting this outcome. Our findings underscore the importance of making a stronger commitment toward policies that make secondary education more accessible to not only benefit education outcomes but also advance population health.

1. Introduction

Intimate partner violence (IPV) is a widespread phenomenon that is acknowledged worldwide as a severe violation of basic human rights. IPV raises serious public health concerns because of its adverse impact on physical, mental, sexual, and reproductive health (Campbell et al., 2002; Ellsberg et al., 2008; Sarkar, 2008). While IPV does occur against men, the victims of IPV are overwhelmingly women (Caldwell et al., 2012). Globally, nearly one in three women who have ever been in a relationship have experienced physical and/or sexual abuse by an intimate partner (Devries et al., 2013). In contrast, men are more likely to experience violence from acquaintances or strangers than a partner (Krug et al., 2002). Recently, the frequency and severity of IPV have risen following movement restrictions due to COVID-19. A United

Nations report predicts 31 million additional gender-based violence cases globally over a six-month lockdown period (UNFPA, 2020). Both immediate and long-term approaches to reducing IPV are urgently needed.

World Health Organization (2013) reports that men's likelihood of committing intimate partner violence against women (IPVAW) increases with the use of alcohol and drugs, economic stress, and social legitimization of the use of violence against women. It is critically important to address the factors that increase men's perpetration of IPVAW. It is also necessary to understand women's attitudes toward IPVAW, which affect women's responses to the abuse. Beegle et al. (2016) report that 40% of women in partnerships who have been victims of IPVAW reside in Africa; nearly 30% of these women justify their partners' acts of violence, with acceptance rates surpassing 70% in some countries.

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These attitudes toward IPVAV shape the responses to the abuse by the victim, her family and community members, law enforcement agencies, and healthcare providers (Flood & Pease, 2009). Beliefs that violence is acceptable impede women from seeking support from friends and family or accessing individuals in positions of authority, even in places with legal protections. These attitudes create barriers to exit and can thus influence ongoing exposure (Abramsky et al., 2011; Uthman et al., 2011). Furthermore, these attitudes can be transmitted inter-generationally, which makes addressing them a crucial element in the design of interventions addressing IPVAV (Heise, 2011; Semahegn et al., 2019). Therefore, even though domestic violence laws that criminalize IPVAV may provide the necessary foundation to limit the occurrence of IPVAV, transforming social norms and attitudes that condone IPVAV is essential to fully realize this goal.

There is strong evidence for the direct impact of attitudes on women's health outcomes, health-seeking behaviors, and healthcare utilization. Beliefs that IPVAV is justifiable are associated with lower usage of maternal healthcare services such as antenatal care, institutional delivery, and postnatal care services (Fawole & Adeoye, 2015; Khan & Islam, 2018; Sripad et al., 2019) and women who perceive IPVAV as justifiable are less likely to use contraceptives and family planning services (Tsai & Subramanian, 2012; Wado, 2018). Furthermore, women victimized by IPV who had lesser power in their intimate relationship were more likely to exhibit depressive symptoms and are more vulnerable to anxiety and posttraumatic stress disorder (Filson et al., 2010; Caldwell et al., 2012).

UN Sustainable Development Goal 5, adopted in 2015, marks the latest effort toward eliminating all forms of violence against women. Even so, substantially reducing IPVAV and changing attitudes toward IPVAV remain unmet goals. It is essential that research shed light on how public policy can influence attitudes. Education initiatives offer promise, given the broad consensus in the literature that limited formal education is among the strongest and most consistent factors associated with acceptance of IPVAV (Rani et al., 2004; Wang, 2016). Education has the potential to influence attitudes toward IPVAV through multiple channels. It leads to improved access to mass media, extensive social networks, and exposure to global gender discourse; all of which have been found to reduce acceptance of IPVAV (Bhattacharya, 2016; Pierotti, 2013; Sandberg et al., 2021). Receiving education might improve women's bargaining power within their intimate partner relationships through improved labor market opportunities, an enhanced sense of independence, and more say in partner choice (Jewkes, 2002; McCloskey et al., 2005). Finally, sustained improvements in education might help create a critical mass of women who find IPVAV unacceptable and thus bring about a change in the community-level gender norms and attitudes within which most acts of IPVAV occur.

Most studies report that women with secondary or higher education are less likely to accept IPVAV (Cools & Kotsadam, 2017; Rani et al., 2004; Uthman et al., 2009). However, these studies are only associational and rigorous studies of its impact on attitudes toward IPVAV are limited. Tuition-free education has the potential to increase access to schooling by removing cost-related barriers that disproportionately affect girls. One single country study by Mocan and Cannonier (2012) examined the impact of free primary schooling policy in 2001 in Sierra Leone on one aspect of IPVAV. They found women's acceptance of wife-beating if she refused sex was reduced. However, multi-country research is needed to assess the impact across settings of making education tuition free as well as the extent to which different levels of tuition-free education make a difference in IPVAV. While it has always been critical, the difficult choices many countries are making amidst economic downturns and the regression in girls' secondary education in different countries amidst the pandemic further raise the importance of investigating the impact of tuition-free secondary education policy.

This paper uses a quasi-experimental approach to investigate the additional effect of tuition-free secondary education policy over tuition-free primary education policy alone on women's acceptance of IPVAV.

To the best of our knowledge, this is the first study to rigorously examine the impact of changing educational policy on attitudes toward IPVAV. Using a difference-in-difference-in-differences (DDD) estimation strategy, we exploit the natural variation in the timing of tuition free education rollout in countries within the Sub-Saharan African region. We estimate the change in women's attitudes toward IPVAV in countries that implement tuition-free secondary policy compared with those with tuition-free primary alone and countries without any tuition-free policy during the study period. Analyzing the additional impact of tuition-free secondary education is especially important because while nearly all countries abolished primary-school tuition fees to achieve universal primary education goals enshrined in the Millennium Development Goals; 33 nations have yet to provide policy or legislative guarantees of tuition-free lower secondary education.

2. Methods

2.1. Data sources

2.1.1. Policy data

We used multiple sources—national legislations, policy documents, and country reports—to generate a longitudinal database to track changes in tuition fee elimination across countries. We gathered information from UNESCO International Bureau of Education (IBE) reports, laws cited by UNESCO's right to education (RTE) website, and official documents available on Planipolis. We analyzed these sources to determine the year of tuition fee elimination, the level of schooling affected, and the usual age at which girls are expected to enter primary and secondary schools as per their country's schooling system.

In this study, we consider only fees charged for tuition; charges for school uniforms, supplies, textbooks, lunch, or other items may still be in place in some countries. In cases where we did not find any explicit details regarding implementation, we used the start of the next academic cycle after the policy was adopted as the policy change year. For countries that defined policy change for relevant age groups, we used their age and grade classification systems to determine the appropriate grade levels affected by the policy change.

2.1.2. Outcomes data

For information on women's attitudes toward IPVAV and other relevant characteristics, we use the Demographic and Health Surveys (DHS) that provide nationally representative data for populations across more than 90 low- and middle-income countries. These data are comparable over time and across countries. We use the individual surveys that collect extensive information from all women aged 15–49 years on their demographic characteristics, education, health, occupation, and attitudes and beliefs. The section on women's attitudes toward IPVAV was first added in DHS recode phase IV from 2000 onward and therefore, we use all DHS conducted between 2000 and 2019. We pooled data from all these surveys to create a repeated cross-sectional dataset that included women born between 1970 and 2001.

The survey asks all female respondents to report their beliefs on whether "a husband is justified in hitting or beating his wife if (i) wife argues with husband, (ii) wife neglects the children, (iii) wife goes out without telling husband, (iv) wife refuses to have sex with husband, and (v) wife burns the food." All women, irrespective of their marital status or experience of IPVAV were required to respond with a yes/no. We constructed two composite variables indicating attitudes toward IPVAV using these responses. First, we created a dichotomous measure indicating whether IPVAV was considered justified under any of the five circumstances, i.e., we coded this variable 0 if a woman believed wife-beating is not justified under any circumstance and 1 if she believed wife-beating is justified under at least one circumstance. This composite measure has been widely used in other studies of attitudes toward IPVAV using DHS surveys (Lawoko, 2008; Hindin, 2014; Uthman et al., 2009). Second, we created a single measure of attitudes toward IPVAV

by adding up all five responses, resulting in a scale ranging from 0 to 5, which indicates the number of circumstances under which a woman justifies IPVAV. We dropped 32,573 women (4.6%) from our sample who had either missing information or responded “don’t know” to these questions, resulting in a final sample size of 683,150 women. Analysis of complete cases is often recommended when missing data are below 5% as multiple imputation offers little advantage in this case (Jakobsen et al., 2017; Lee et al., 2016).

2.1.3. Analytical sample

We compare outcomes for women both within and across countries. We estimate the change in outcomes before and after the policy rollout within treated countries. However, this difference could be due to the policy or because of other changes over time. To parse out the policy effect, we estimate this general time trend by using outcomes of women in the same age cohorts in countries without a policy change but that are otherwise similar to the treated countries and then difference out this estimated time trend. To estimate the impact of extending tuition-free policy from primary to secondary, we needed to identify treated countries that introduced tuition-free policy only up to the primary level along with those that made it free all the way up to the secondary level and compare both these sets of treated countries to countries without a tuition-free policy.

The treated countries comprise 11 countries that have tuition-free policy up to the secondary level and 8 countries that have tuition-free policy at the primary level only. The DHS surveys in these countries provide information on girls born during the pre-policy period and on those who were exposed to the policy during the post-policy period. The comparison countries comprise 10 countries. With the exception of 3 countries (Niger, South Africa, and Zimbabwe), all the countries in the comparison category introduced tuition-free policy at either the primary or the secondary levels but their most recent DHS survey was conducted too close to the time of policy rollout for it to have surveyed girls exposed to these policies. Therefore, the comparison and treated group of countries are similar in their policy priorities and differ only in the timing of policy adoption and the survey years. Table 1 shows the policy and exposure details.

We consider girls expected to enter school after policy implementation as exposed to the policy. For example, Angola introduced a tuition-free primary policy in 2001 and girls are expected to enter primary school at the age of 6. Therefore, we expect girls born in the year 1995 or later to be exposed to free-primary. As for the countries with tuition-free secondary policy, this way of defining policy exposure results in two different exposure groups — girls exposed to both primary and secondary tuition-free policy and those who were only partially exposed to tuition-free secondary only.

For example, Ghana eliminated tuition fees up to the secondary level in 1997. Girls in Ghana are expected to enter primary and secondary school at the age of 6 and 12 respectively. Therefore, girls born after 1991 were exposed to both tuition-free primary and secondary but girls born between 1985 and 1990 would have had to pay for primary school to be able to reach at a level where they could access tuition-free secondary. While tuition-free secondary policy might have benefited those already enrolled in primary school, its scope to immediately increase enrolments at the secondary level might be limited. We consider these birth cohorts as partially exposed to the policy and following Osili and Long’s (2008) approach, we only compare girls with full exposure to those without any exposure. Table 2 shows DHS waves used and the sampling distribution of women. Of all women in our sample, 8% were exposed to free-secondary policy and 4.3% were exposed to free-primary but not free-secondary policy.

2.2. Empirical strategy

The DD strategy is a popular quasi-experimental method for causal estimation (Angrist & Pischke, 2008) that allows comparison of

Table 1

Exposure of birth cohorts to tuition-free primary and secondary education policies.

Country	Tuition-free policy year	Expected age at the start of school (Primary, Secondary)	Earliest birth cohort exposed to tuition-free schooling
<i>Treated Countries (Secondary-free exposure)^a</i>			
Chad	2006	(6, 12)	2000
Cote d’Ivoire	1995	(6, 12)	1989
Gambia	2004	(7, 13)	1997
Ghana	1997	(6, 12)	1991
Kenya	2003	(6, 11)	1997
Malawi	1995	(6, 11)	1989
Mali	2000	(7, 13)	1993
Nigeria	2004	(6, 12)	1998
Rwanda	2003	(7, 13)	1996
Senegal	2005	(6, 12)	1999
Sierra Leone	2000	(6, 12)	1994
<i>Treated Countries (Primary-free exposure)</i>			
Angola	2001	(6, 12)	1995
Benin	2003	(6, 12)	1997
Burundi	2005	(7, 13)	1998
Cameroon	2000	(6, 12)	1994
Ethiopia	1994	(7, 11)	1987
Lesotho	2000	(6, 13)	1994
Namibia	2001	(6, 13)	1995
Tanzania ^b	2003	(7, 14)	1996
<i>Comparison Countries (No free schooling exposure)^c</i>			
Burkina Faso	2007	(6, 12)	2001
DRC	2015	(6, 12)	2009
Madagascar	2003	(6, 11)	1997
Mozambique	2005	(6, 13)	1999
Niger	–	(7, 13)	–
Sao Tome	2003	(6, 12)	1997
South Africa	–	(6, 12)	–
Swaziland	2010	(6, 13)	2004
Togo	2009	(6, 12)	2003
Zimbabwe	–	(6, 13)	–

^a Girls in these countries were exposed to both primary and secondary tuition-free policies at the same time.

^b Tanzania later eliminated tuition-fees up to the secondary level but the currently available DHS surveys include girls exposed to tuition-free primary alone.

^c These birth cohorts were expected to be the first beneficiaries of tuition-free policy; however, they were not interviewed in the currently available DHS.

treatment and control groups over a given period. We use the fact that many countries abolished tuition fees for different levels of schooling at different points in time to conduct our analyses using an extension of the DD method i.e. the triple-difference method (DDD). Because we have multiple countries that change their policy at different times, we use an extension of the DD specification as described in Wooldridge (2007). In doing so, we compare countries that have similar policies but differ only in the timing of their rollout. Unless multiple policies exactly coincide with each other, the DDD method isolates the treatment effect of the intervention.

The DDD identification strategy helps us build on the DD by estimating the additional effect of exposure to tuition-free secondary policy over the effect of exposure to tuition-free primary alone on women’s attitudes toward IPVAV. We estimate the policy effect using the following equation:

$$Y_{i,c,t} = \beta_0 + \beta_1 Primary_{c,t} + \beta_2 Secondary_c + \beta_3 (Primary_{c,t} * Secondary_c) + \xi X_{i,c,t} + \gamma_c + \delta_t + \lambda(t * Country) + \epsilon_{i,c,t} \tag{1}$$

where $Y_{i,c,t}$ is attitudes toward IPVAV of woman i living in country c in year t , $Primary_{c,t}$ is a dummy variable that captures exposure to tuition-free primary (it takes the value 1 for all women born in the post-policy period in treated countries), $Secondary_c$ indicates whether a woman was exposed to free-secondary as well, $X_{i,c,t}$ represents individual-level covariates, γ_c and δ_t are country- and year-fixed effects respectively, λ

Table 2
DHS waves used for the analytical sample and sampling distribution of women.

Country	DHS Waves Used	Sampling Distribution		Primary and Secondary Exposure
		No exposure	Only Primary exposure	
<i>Treated Countries (Secondary-free)</i>				
Chad ^a	2015	10,498	0	87
Cote d'Ivoire ^a	2012	3220	0	3161
Gambia ^a	2013	5877	0	567
Ghana ^a	2003, 2008, 2014	8543	0	3405
Kenya ^a	2003, 2009, 2014	19,876	0	1437
Malawi ^a	2000, 2005, 2010, 2016	29,591	0	18,355
Mali ^a	2001, 2006, 2013, 2018	23,670	0	6009
Nigeria ^a	2003, 2008, 2013	51,286	0	772
Rwanda ^a	2000, 2005, 2010, 2015	34,081	0	2349
Senegal ^a	2005, 2011, 2012–2019	62,548	0	8643
Sierra Leone ^a	2008, 2013, 2019	22,526	0	9722
<i>Treated Countries (Primary-free)</i>				
Angola ^b	2016	9296	3642	0
Benin ^b	2001, 2006, 2012, 2018	42,308	4047	0
Burundi ^b	2011, 2017	20,709	3263	0
Cameroon ^b	2004, 2011, 2018	26,090	7214	0
Ethiopia ^b	2000, 2005, 2011, 2016	30,012	5779	0
Lesotho ^b	2005, 2010, 2014	14,759	2026	0
Namibia ^b	2007, 2013	13,373	1118	0
Tanzania ^a	2005, 2010, 2016	24,402	2566	0
<i>Comparison Countries (No Free Schooling)</i>				
Burkina Faso ^a	2003, 2010	21,250	0	0
DRC ^a	2007, 2014	22,578	0	0
Madagascar ^b	2004, 2009	18,244	0	0
Mozambique ^b	2004, 2011	19,822	0	0
Niger ^c	2006, 2012	16,037	0	0
Sao Tome ^b	2009	1840	0	0
South Africa ^c	2016	7724	0	0
Swaziland ^b	2007	3616	0	0
Togo ^b	2014	8287	0	0
Zimbabwe ^c	2006, 2011, 2015	26,926	0	0
Total (N = 683,151)		598,989	29,655	54,507

^a Countries with tuition-free secondary policy.

^b Countries with tuition-free primary policy.

^c Countries without tuition-free policy.

captures country-specific linear time trend, and ε_{ict} is the error term. β_1 is the DD estimate for the effect of tuition-free primary policy, β_2 estimates the difference in attitudes toward IPVAW in countries that made tuition free up to the secondary level vis-à-vis other countries in the study, and β_3 is the DDD estimate, our coefficient of interest, capturing the additional effect of tuition-free secondary education policy over tuition-free primary alone on women's attitudes toward IPVAW.

$Y_{i,c,t}$ is our primary outcome of interest. We capture it in three ways: (i) a dichotomous variable indicating whether a woman perceives IPVAW as justified under any circumstance, (ii) a scale variable ranging from 0 to 5 indicating the number of circumstances under which IPVAW was justified, and (iii) dichotomous variables for each of the five circumstances considered separately to understand the specific drivers of changes estimated. We estimate equation (1) using linear probability models (LPM) for all dichotomous outcomes and linear regression

models for the scale measures. LPM produce coefficients that are direct impact estimates and are interpreted in terms of percentage point change in the outcomes. LPM have been widely used in impact evaluations for binary outcomes as they avoid the complications associated with estimation and interpretation of multiple interaction terms as in logit and probit models (Ai & Norton, 2003; Buchmueller & DiNardo, 2002; Cantor et al., 2012). The LPM does a very good job when the main purpose of the study is to estimate the regression coefficients and not use it as a predictive model. The usual disadvantage of predicted probabilities being outside the interval of 0 and 1 is not a serious concern given that across all our specifications, very few predicted probabilities lie outside this bound (Wooldridge, 2010).¹ To account for heteroskedasticity and correlation of observations within countries, we use cluster-robust standard errors (Bertrand et al., 2004; Nichols & Schaffer, 2007).

Additionally, the country fixed effects help us control for time-invariant differences in levels of outcomes across all countries. The birth-year fixed effects control for underlying secular time trends in each of the outcomes across all countries. As for the individual covariates, we include women's type of residence (urban/rural), sex of the household head, and women's age at the time of survey.² Wealth status, level of education, and age at marriage are not included because they might themselves be impacted by tuition-free education policies. Including post-treatment variables might potentially bias the impact estimates as argued by Behrman (2015) and Koski et al. (2018) while evaluating universal education policies in Sub-Saharan Africa using DHS surveys, and such covariates were left out of their analyses.

As an additional internal validity check, we look for other relevant policy shifts that might have coincided with tuition-free policy and potentially confound our estimates. We analyze the presence of domestic violence laws, the year of adoption, and whether they had criminal offence provisions. We found no association between the years of the adoption of the education policy and domestic violence laws within the treated and comparison countries. Furthermore, we formally test for the influence of domestic violence laws by refitting our model while controlling for individual women's exposure to domestic violence laws. We considered a woman exposed to domestic violence law if the law had criminal offence provisions and if she was surveyed after the law was passed.

The validity of our estimates relies upon the assumption that the precise timing of policy implementation is exogenous to women's attitudes toward IPVAW. Because we use the trend in outcomes in comparison countries as a counterfactual for the trend in outcomes in treatment countries had they not been treated, we tested for this assumption's appropriateness by checking for differences in trends between comparison and treatment countries during the pre-policy period. We used a similar model as shown in equation (1) on the restricted sample of women who were unexposed to tuition-free education policies in all the countries to formally test for any statistically significant difference in trends between treatment and comparison countries before tuition-free education policies were adopted. All analyses were conducted using Stata 14 software.

¹ Following the recommendations of Hoxby and Oaxaca (2006), we find that all our impact estimates are robust to the exclusion of observations from the analytical sample whose predicted probabilities lie outside the interval of 0 and 1 (results not shown here); further demonstrating that the OLS estimator is consistent.

² We do not include household religious affiliation because it was not significantly associated with the outcomes and did not impact the policy estimates in countries for which information is available and not all countries collect information on religion.

Table 3
Descriptive statistics of key characteristics of women in the sample.

Sample Characteristics % Mean (SD)	Treated Secondary-free Countries		Treated Primary-free Countries		Comparison Countries	Overall
	Pre	Post	Pre	Post		
	<i>Attitude toward IPVAW</i>					
Justified under at least one circumstance	51.03 (49.99)	39.95 (48.98)	47.77 (49.95)	43.18 (49.53)	45.98 (49.84)	47.88 (49.96)
IPVAW justified scale (Range 0 to 5)	1.59 (1.87)	1.21 (1.68)	1.42 (1.80)	1.18 (1.70)	1.32 (1.74)	1.44 (1.81)
IPVAW justified if						
(a) goes out without telling the husband	36.25 (48.07)	25.97 (43.85)	31.00 (46.25)	25.02 (43.31)	30.52 (46.05)	32.34 (46.78)
(b) neglects children	38.18 (48.58)	28.52 (45.15)	37.06 (48.30)	32.62 (46.88)	31.99 (46.64)	35.56 (47.87)
(c) argues with husband	33.56 (47.22)	27.95 (44.88)	30.01 (45.83)	25.66 (43.68)	29.01 (45.38)	30.86 (46.19)
(d) refuses sex	32.31 (46.77)	21.90 (41.36)	23.56 (42.44)	18.85 (39.11)	24.33 (42.91)	26.88 (44.34)
(e) burns food	18.60 (38.91)	13.49 (34.17)	20.81 (40.60)	18.50 (38.83)	16.39 (37.02)	18.31 (38.67)
<i>Other characteristics</i>						
Urban residence	35.71 (47.91)	34.71 (47.61)	38.24 (48.60)	41.10 (49.20)	34.45 (47.52)	36.26 (48.08)
Household Head Sex (Female)	24.50 (43.01)	28.98 (45.37)	26.20 (43.97)	29.30 (45.51)	26.59 (44.18)	26.50 (7.67)
Sample Size (unweighted)	271,716	54,507	180,948	29,655	146,324	683,150

Mean values are weighted according to the weights provided in the DHS.

2.3. Sensitivity analyses

Our definition of exposure relies upon the age at which a girl is expected to enter primary and secondary school. We do not have complete information from women on their schooling history and whether they actually used tuition-free education policies, resulting in intent-to-treat estimates. In our primary specification, we excluded girls expected to have partial exposure to tuition-free secondary policy from the sample. We assess the sensitivity of our findings to several alternative specifications by including this group of girls back. First, we assign unexposed status to this partial exposure group. In this case we would assume that tuition-free secondary policy would have had a limited impact on them because they had to pay tuition at the primary level. Second, we assign full exposure status to this group assuming that tuition-free secondary would have incentivized girls already in primary school to transition to secondary. Third, we control for this group’s exposure by assigning them a dummy variable.

Table 4
DD regression estimates of the impact of tuition-free primary education alone on women’s attitudes toward intimate partner violence against women (IPVAW).

Outcomes	(1)	(2)	(3)
	Model 1 (Full sample)	Model 2 = Model 1 + Control for respondent’s age and the sex of household head	Model 2 + Control for exposure to DV Laws
	Policy Effect (95% CI ^a)	Policy Effect (95% CI ^a)	Policy Effect (95% CI ^a)
<i>Panel A</i>			
IPVAW justified under at least one circumstance	2.12 (-2.25, 6.50)	3.19 (-1.78, 8.17)	3.20 (-1.51, 7.90)
IPVAW justified scale (Range 0 to 5)	0.08 (-0.05, 0.20)	0.11 (-0.03, 0.25)	0.10 (-0.03, 0.24)
<i>Panel B</i>			
Circumstances under which IPVAV justified:			
(a) goes out without telling the husband	1.77 (-1.17, 4.70)	2.56 (-1.01, 6.13)	2.44 (-0.74, 5.63)
(b) neglects children	1.70 (-1.68, 5.09)	2.65 (-1.36, 6.66)	2.66 (-1.13, 6.44)
(c) argues with husband	1.92 (-0.56, 4.40)	2.48 (-4.40, 5.41)	2.33 (-0.35, 5.00)
(d) refuses sex	1.35 (-0.22, 2.91)	1.74 (-0.15, 3.64)	1.70 (-0.19, 3.59)
(e) burns food	0.77 (-1.52, 3.06)	1.32 (-1.18, 3.82)	1.25 (-1.02, 3.53)
Sample Size (N)	683,150	683,150	683,150

*** p<0.01, ** p<0.05, * p<0.10. All models control for rural/urban residence.

^a 95% Confidence Intervals (CI). Standard errors are clustered at the country level.

3. Results

3.1. Descriptive statistics

Table 3 presents the sample characteristics for the treated and comparison countries. For the treated countries, we show the estimates separately for women born in the pre- and post-policy change period. A high proportion of women stated IPVAV was justified under at least one of the five scenarios, ranging from 46% in the comparison countries to 51% during the pre-policy period in the countries that adopted tuition-free secondary policy. Overall, the most common reason cited for perceiving IPVAV as justified was neglecting children, with 36% of women subscribing to this view. 32% women reported that IPVAV was justified if a wife went out without telling her husband, 31% felt IPVAV was justified if she argued with her husband, and 27% viewed IPVAV as justified if she refused sex. The reasons described as least acceptable was if she burned food with about 18% women believing so. Other individual characteristics considered in the study, urban residence and sex of the

household head are similar across the treated and comparison countries. Approximately 36% women reside in urban areas and roughly 27% households were headed by a woman.

3.2. Impact of tuition-free primary education policy

Table 4 shows the estimated DD policy effects measuring the impact of abolishing tuition fee at the primary level alone when compared to countries that did not have a tuition-free policy in place. The first column reports the results for the full sample of women while controlling for country and time fixed effects as well as women’s type of residence (rural/urban). The second column builds on this model and controls for women’s age at the time of interview and sex of the household head. Column 3 shows the results after controlling for exposure to domestic violence laws.

First, we study the effect of these policies on the composite measures of attitudes toward IPVAV as shown in Panel A of Table 4. Tuition-free primary education policy alone did not reduce the probability of IPVAV being perceived as justified under at least one of the five circumstances. It did not reduce the number of circumstances perceived as justified either. The results in columns 2 and 3 remain unchanged after controlling for the respondent’s age at the time of survey, sex of the household head, and exposure to domestic violence laws. In Panel B of Table 4, we turn to the individual drivers of these composite measures of women’s attitudes toward IPVAV and find that none of the five circumstances moved in response to the changes in tuition-free primary policy.

3.3. Impact of tuition-free secondary education policy

Table 5 shows the estimated DDD policy effects measuring the additional impact of abolishing tuition fee at the secondary level of schooling as opposed to the primary level alone when compared to countries that did not have a tuition-free policy in place. The columns correspond to the same specifications as in Table 4.

The impact was significantly higher in countries that abolished tuition fee all the way up to secondary school than the impact in countries that abolished tuition fee only at the primary level of

schooling. While tuition-free primary education policy alone did not reduce the probability of IPVAV being perceived as justified under any circumstance, tuition-free secondary did reduce it significantly. The decline in the probability that IPVAV was perceived as justified under at least one circumstance was 5.1 percentage points more on average in countries that adopted tuition-free policy up to the secondary level relative to those that adopted only up to the primary level of schooling. This difference increases slightly to 5.3 percentage points when we control for the respondent’s age at the time of the interview.

Next, we consider the policy effects on attitudes on a scale ranging from 0 to 5 points. Exposure to tuition-free primary education policy had no effect but exposure to tuition-free secondary education policy reduced it. Importantly, the difference between the impact of tuition-free secondary and primary policies is statistically significant with the impact being 0.17 points higher in secondary-free countries than in primary-free countries. These results remain unchanged after controlling for domestic violence laws.

In Panel B of Table 5, we turn to the individual drivers of these composite measures of women’s attitudes toward IPVAV. We find that the results are driven by changes in four of the five circumstances. Exposure to tuition-free secondary education policy beyond primary reduced the probability of believing IPVAV is justified if a woman goes out without telling her husband by 3.8 percentage points on average. The impact was 3.9 percentage points if she neglected her children. The decline for the circumstances in which she argues with husband and if she refuses sex was 3.6 and 3.5 percentage points on average. However, we find no evidence that tuition-free secondary policy affected the probability of perceiving IPVAV as justified if a wife burned food.

3.4. Model assumptions test

The validity of our estimates reported in Table 4 and Table 5 depends on the assumption that trends in women’s attitudes toward IPVAV would have been similar in treatment and comparison countries had tuition-free education policy not been rolled out. We examine the trends in attitudes in treatment and comparison countries before tuition-free education policies were introduced. First, we graphed the pre-policy trends in the probability of each of the outcomes across tuition-free

Table 5

DDD regression estimates of the additional impact of tuition-free secondary education policy vs. tuition-free primary education alone on women’s attitudes toward intimate partner violence against women (IPVAV).

Outcomes	(1) Model 1 (Full sample)	(2) Model 2 = Model 1 + Control for respondent’s age and the sex of household head	(3) Model 2 + Control for exposure to DV Laws
	Policy Effect (95% CI ^a)	Policy Effect (95% CI ^a)	Policy Effect (95% CI ^a)
<i>Panel A</i>			
IPVAV justified under at least one circumstance	-5.13** (-9.46, -0.80)	-5.27** (-10.14, -0.40)	-5.27** (-9.94, -0.60)
IPVAV justified scale (Range 0 to 5)	-0.17*** (-0.29, -0.04)	-0.17** (-0.31, -0.03)	-0.17** (-0.29, -0.04)
<i>Panel B</i>			
Circumstances under which IPVAV justified:			
(a) goes out without telling the husband	-3.85*** (-6.59, -1.11)	-3.96** (-7.13, -0.79)	-3.84*** (-6.57, -1.11)
(b) neglects children	-3.73* (-7.46, -0.00)	-3.85* (-8.05, 0.34)	-3.86* (-7.87, 0.16)
(c) argues with husband	-3.67*** (-6.31, -1.03)	-3.75** (-6.79, -0.72)	-3.60** (-6.35, -0.85)
(d) refuses sex	-3.46*** (-4.96, -1.96)	-3.52*** (-5.54, -1.50)	-3.48*** (-5.36, -1.60)
(e) burns food	-1.89 (-4.59, 0.80)	-1.97 (-4.72, 0.78)	-1.90 (-4.44, 0.64)
Sample Size (N)	683,150	683,150	683,150

*** p<0.01, ** p<0.05, * p<0.10. All models control for rural/urban residence.

^a 95% Confidence Intervals (CI). Standard errors are clustered at the country level.

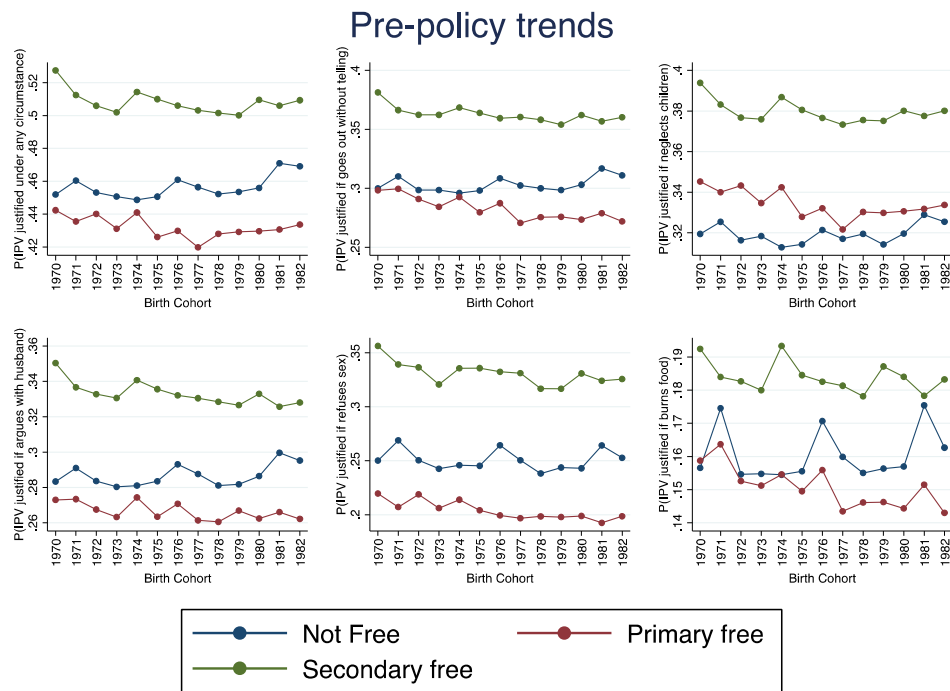


Fig. 1. Pre-policy trends in attitudes toward IPVAV by treatment status.

Table 6

Regression estimates after limiting the sample to only those countries that meet the parallel trends requirement during the pre-policy period.

Outcomes	(1)	(2)
	DD estimates for tuition-free primary alone	DDD estimates for tuition-free secondary
	Policy Effect (95% CI ^a)	Policy Effect (95% CI ^a)
Panel A		
IPVAW justified under at least one circumstance	3.72 (-2.48, 9.92)	-5.67** (-11.24, -0.10)
IPVAW justified, as measured on a scale (Range 0 to 5)	0.13 (-0.05, 0.30)	-0.18** (-0.35, -0.02)
Panel B		
Circumstances under which IPVAV justified:		
(a) goes out without telling the husband	3.27 (-1.07, 7.60)	-4.47** (-8.10, -0.83)
(b) neglects children	3.25 (-1.71, 8.22)	-4.29* (-9.13, 0.54)
(c) argues with husband	2.89 (-0.67, 6.46)	-4.08** (-7.37, -0.78)
(d) refuses sex	2.06 (-0.25, 4.38)	-3.75*** (-5.96, -1.54)
(e) burns food	1.19 (-1.91, 4.28)	-1.88 (-4.96, 1.20)
Sample Size (N)	647,359	647,359

*** p<0.01, ** p<0.05, * p<0.10. All models control for rural/urban residence, respondent's age, and sex of the household head.

^a 95% Confidence Intervals (CI). Standard errors are clustered at the country level.

secondary, tuition-free primary, and the comparison countries. We identified only one country, Ethiopia, that had a slightly downward trend in the probability of considering IPVAV as justified before the adoption of tuition-free policy.

We formally test for the parallel trends assumption by restricting the sample to the pre-policy years and checking for the interaction term's significance, as shown in equation (1). None of the interaction terms between the time trend and treatment/comparison countries were significant. We show this graphically in Fig. 1. There was no evidence for differences in trends in women's attitudes toward IPVAV between treatment and comparison countries during the pre-policy years. This finding lends credibility to our assumption that these trends would have

continued to be similar in the absence of tuition-free education policy. We also report the results from our earlier model specification excluding Ethiopia in Table 6 and find our estimates to be robust.

3.5. Sensitivity analyses

We report the sensitivity of our estimated effects to alternative specifications in Table 7. The policy effects shown in column 1 of Table 7 result from considering girls already in primary school while primary and secondary tuition fees were still charged as unexposed to the policy. The rationale behind doing so is that the effect of eliminating tuition fees at secondary level might be limited to girls who could afford to pay for

Table 7
Sensitivity Analyses for the DDD estimates.

Outcomes	(1) Women with partial exposure to free secondary considered unexposed	(2) Women with partial exposure to free secondary considered fully exposed	(3) Controlling for women’s partial exposure to free secondary policy
	Policy Effect (95% CI ^a)	Policy Effect (95% CI ^a)	Policy Effect (95% CI ^a)
<i>Panel A</i>			
IPVAW justified under at least one circumstance	−4.24 (−10.28, 1.80)	−6.15** (−11.90, −0.40)	−6.10** (−11.92, −0.27)
IPVAW justified scale (Range 0 to 5)	−0.13 (−0.31, 0.50)	−0.21** (−0.39, −0.03)	−0.20** (−0.37, −0.03)
<i>Panel B</i>			
Circumstances under which IPVAW justified:			
(a) goes out without telling the husband	−3.50* (−7.58, 0.56)	−4.88** (−9.06, −0.69)	−4.86** (−8.76, −0.97)
(b) neglects children	−2.98 (−8.17, 2.21)	−4.99* (−10.03, 0.05)	−4.62* (−9.69, 0.44)
(c) argues with husband	−2.85 (−6.51, 0.81)	−4.41** (−7.78, −1.04)	−4.27** (−7.74, −0.81)
(d) refuses sex	−2.30* (−4.87, 2.78)	−4.31** (−6.84, −1.78)	−4.10*** (−6.50, −1.70)
(e) burns food	−1.15 (−4.28, 1.98)	−2.49 (−5.77, 0.79)	−2.21 (−5.47, 1.05)
Sample Size (N)	714,486	714,486	714,486

*** p<0.01, ** p<0.05, * p<0.10. All models control for rural/urban residence, respondent’s age, and sex of the household head.

^a 95% Confidence Intervals (CI). Standard errors are clustered at the country level.

primary school before they could access tuition-free secondary schooling. Our results, however, suggest that this group of girls indeed benefitted from tuition-free secondary policy.

In contrast to our original definition, we tried another specification that considers all girls already in primary school to be fully exposed to the policy. We find similar magnitude and significance of the estimated effects found previously. This suggests that the effect of tuition-free secondary was similar across girls who were yet to enter school and those who were already in primary school at the time of policy rollout. Lastly, we test for the sensitivity of our results to the inclusion of this group of girls as a separate category indicated by a dummy variable. Once again, we find our estimates to be robust to this specification and reinforce our conclusion that tuition-free secondary education brings about sizeable gains for these measures.

4. Discussion

In this study, we use a quasi-experimental study design to examine the effect of tuition-free secondary education policy on women’s attitudes toward IPVAV. Our results broadly suggest that secondary education changes attitudes toward IPVAV, making it less acceptable to women, and that extension of tuition-free education policy from primary to secondary has a particularly important impact on attitudes.

We investigated attitudes toward IPVAV in several ways: as a dichotomous measure indicating whether a woman perceives IPVAV as justified in at least one of the five circumstances asked in a set of global surveys, a composite scale variable ranging from 0 to 5 indicating the number of circumstances in which a woman perceives IPVAV as justified; and finally, we examine each of the five circumstances individually. We find that extending tuition-free education policy to the secondary level of schooling reduces both the probability of women perceiving IPVAV as justified in at least one of the circumstances and the number of circumstances in which she finds IPVAV justified. Furthermore, our results indicate clear improvements following the introduction of tuition-free secondary policy for four of the five circumstances in particular—if the wife goes out without telling her husband, if she argues with him, neglects her children, and if she refuses sex.

These results are robust to alternative specifications. Moreover, the pre-treatment parallel trends test, showing similar trends in women’s

attitudes in treatment and comparison countries before policy rollout, bolsters our confidence that they are indeed comparable. The additional checks for other policy shifts such as domestic violence laws rule out the possibility of confounding of our impact estimates and lend support to the claim that changes in attitudes toward IPVAV indeed resulted from tuition-free secondary education policy.

Additionally, we make an important distinction between tuition-free primary and secondary education in this study. While we find tuition-free primary to have no effect, the estimates for tuition-free secondary policy consistently show its impact on the composite measures and on four of the five circumstances cited for perceiving IPVAV as justified. These results clearly demonstrate the far greater impact of tuition-free secondary education. Across various specifications, we consistently find tuition-free secondary to reduce the probability of IPVAV being perceived as justified under any circumstance by 5–6% points. Given the overall acceptance rate of 48%, this translates to a sizeable reduction. Our causal results are in line with the associational findings of Rani et al. (2004) and Uthman et al. (2009) that show the association between education and attitudes towards IPVAV becoming apparent only at the secondary or higher levels with primary education having limited or no association at all. It is plausible that the transformative role of education in changing existing gender norms is likely to happen only at the higher levels. A few additional years of primary education at a very young age may not empower individuals to challenge gender bias.

While we have clear evidence that tuition-free secondary matters for four of the five circumstances, we need a better understanding of what changes attitudes among women who believe IPVAV is justified if they burn food. The attitudes were not moved at all for the small group of women who believed IPVAV is justified if they burn food. Interestingly, burning food is the least cited reason for IPVAV being perceived as justified. Furthermore, among women who see IPVAV as justified if they burn food, an overwhelming 57% believe IPVAV is justified under all other four circumstances as well. It is noteworthy that burning food is the least common reason women find IPVAV acceptable not just in these countries but also beyond (Rani et al., 2004; Soltaroff & Pande, 2014). Therefore, it is plausible that this group of women’s experiences and life circumstances are different from others and more research is needed to better understand their social conditions.

Limitations of this research include first the possibility of other

coincident policy changes. To address this, we examine IPV laws in each country to ensure any change in these laws did not affect results. Our use of a large number of countries in each of the treated and comparison categories mitigates the concerns regarding other unique shifts coinciding with our policy of interest.

Second, a quasi-experimental design requires using the expected age of entry into school instead of the actual age to define treatment status. Doing so is essential because the policy can affect the actual age of entry. While using the expected age is the more rigorous approach, some girls may have been misclassified in terms of exposure to the policy if other factors affected their age of entry. Moreover, there is no accurate way to ascertain the actual age at which they start primary and secondary school using these data. Nonetheless, we report the sensitivity of our results to different age specifications and find our results to be robust.

The third limitation relates to the measurement of IPVAV in the DHS dataset. The survey captures attitudes toward only one form of IPVAV that is physical. Research shows that other forms of violence such as sexual and emotional are as harmful (Yoshihama et al., 2009). Heise et al. (2019) find emotional abuse prevalence to be as high as 58% in some countries. Further work is needed to understand women's attitudes toward other forms of IPVAV and factors which affect these attitudes.

Fourth, it is possible that countries that pass tuition-free policy are different. We address this potential limitation both by testing for pre-policy differences, and finding no significant ones, and by including comparison countries that go on to pass these policies after the study. While pooling the data across countries might mask some impact in individual countries, the main contribution of this study is to examine policy effects across different settings. Furthermore, pooling many countries makes the policy effect less susceptible to unique shifts within countries. Importantly, we believe it is essential to go beyond this research and study how education shifts men's attitudes toward IPVAV. However, we were unable to conduct this analysis because of insufficient data on men's attitudes in the publicly available global surveys of countries that changed policies.

5. Conclusion

Overall, this study points to important policy implications of making secondary education tuition-free. While there is a global commitment for universal tuition-free primary education, similarly strong commitments to tuition-free secondary education across all countries have not yet been made. Tuition-free secondary education has profound implications for equal opportunity across gender, class, and many other dimensions of equity. Yet economic constraints in countries continue to raise the question of how highly to prioritize the elimination of tuition fees for secondary education. Moreover, the global economic downturn brought on by the Covid-19 pandemic has simultaneously raised the importance of dropping tuition barriers so all youth can afford to attend secondary school and heightened the difficulty for the most resource-constrained countries. At the same time, amid the pandemic, global rises in unemployment, and lockdowns, reports of IPVAV have risen. Our work provides evidence supporting the substantial role of secondary education in changing attitudes toward and experience of IPVAV, further underscoring the urgent need to make secondary school tuition-free for all globally to improve population health.

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Authors' statement

We declare that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere.

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed.

We further confirm that the order of authors listed in the manuscript has been approved by all of us.

Ethical statement common for all authors

Institutional Review Board (IRB) Approval: IRB approval not needed because publicly available, confidential, secondary data was used for the analysis.

Declaration of competing interest

None.

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