USAID
FROM THE AMERICAN PEOPLE

DHS WORKING PAPERS

Information Communication Technologies and Intimate Partner Violence among Women in sub-Saharan Africa Countries

Marifa Muchemwa
Million Phiri
Oluwatoyin Aladejebi

2022 No. 186

DEMOGRAPHIC AND HEALTH SURVEYS

September 2022

DHS Working Papers No. 186

Information Communication Technologies and Intimate Partner Violence among Women in sub-Saharan Africa Countries

Marifa Muchemwa[1]
Million Phiri[1]
Oluwatoyin Aladejebi[1]

ICF
Rockville, Maryland, USA

September 2022

[1]Department of Population Studies, Schools of Public Health and Social Science, University of the Witwatersrand, Johannesburg, South Africa

Corresponding author: Marifa Muchemwa, University of the Witwatersrand; phone: +27117174095; email: marifamuchemwa@yahoo.com.

Acknowledgments: The authors wish to convey their gratitude to the United States Agency for International Development (USAID) for funding this research project through the 2022 DHS Fellows Program implemented by ICF International. We are grateful to Drs. Shireen Assaf and Sara Riese who facilitated the workshop that led to the creation of this paper and who provided technical support throughout the project. We also want to acknowledge the cofacilitators, Bienvenu Salim Camara and Elma Laguna, for their tireless effort in guiding this study. We also thank the technical coordination team who provided tireless efforts to ensure that the online workshop was a success. Finally, we are indebted to Professor Clifford Odimegwu, the Head of Demography and Population Studies Department at the University of the Witwatersrand, for allowing us to attend the DHS fellows' workshops

Editor: Diane Stoy
Document Production: Natalie Shattuck

This study was conducted with support from the United States Agency for International Development (USAID) through The DHS Program (#720-OAA-18C-00083). The views expressed are those of the authors and do not necessarily reflect the views of USAID or the United States Government.

The DHS Program assists countries worldwide in the collection and use of data to monitor and evaluate population, health, and nutrition programs. For additional information about The DHS Program, contact: DHS Program, ICF, 530 Gaither Road, Suite 500, Rockville, MD 20850, USA; phone: +01 301-572-0950; fax: +01 301-572-0999; fax: +01 301-407-6501; email: reports@dhsprogram.com; internet: www.dhsprogram.com.

Recommended citation:

Muchemwa, Marifa, Million Phiri, and Oluwatoyin Aladejebi. 2022. *Information Communication Technologies and Intimate Partner Violence among Women in sub-Saharan Africa Countries*. DHS Working Papers No. 186. Rockville, Maryland, USA: ICF.

CONTENTS

TABLES

FIGURES

ABSTRACT

Intimate partner violence (IPV) is increasing in sub-Saharan Africa with women the usual victims. Efforts to address IPV include interventions with information communication technologies (ICT) that are being used to raise awareness and promote the empowerment of women. There is the need to examine the relationship between ICT ownership and IPV among women in sub-Saharan Africa. We conducted a cross-sectional study of four countries in sub-Saharan Africa using DHS data. Ownership of ICT was the main independent variable that was measured by ownership of a radio, television, mobile phones, and access to the internet. The dependent variable was IPV, which was measured in two forms—physical and sexual violence. A multivariate analysis using binary logistic regression was used to examine the association between ownership of ICT devices and intimate partner violence among women. In Zambia and Mali, women who own ICT devices were significantly less likely to experience sexual violence than those who did not own ICT devices. Access to ICT should be promoted among women because ICT can raise awareness and offer women a platform for receiving social support and advice about coping with intimate partner violence. More research is needed.

KEY WORDS: Intimate partner violence, information communication technologies, Sub-Saharan Africa, physical and sexual violence

1 INTRODUCTION

Intimate partner violence (IPV) is widespread in most countries, and is a public health concern with a significant majority of IPV being perpetrated by men against women with physical and sexual violence (WHO 2012). However, studies have shown that men also experience intimate partner violence (Lien and Lorentzen 2019; USAID n.d.; Walker et al. 2020). Sub-Saharan Africa has high levels of violence against women (Pesando 2021). Among the 15 countries where the greatest proportion of individuals agree with husbands beating their wives in certain circumstances, 14 countries are located in the sub-Saharan region of Africa (Devries et al. 2013; García-Moreno et al. 2005). Although countries in sub-Saharan Africa are signatories to international and regional frameworks that protect and promote women's rights and have enacted various acts to protect women from any form of gender-based violence, violence against women continues to increase.

The introduction of information communication technologies (ICTs) has facilitated interventions in the fight against violence against women, and is increasingly common (Bramon 2018) with the empowerment of women being advocated as a measure to reduce violence against women. Access to ICT may shape women's attitudes towards behaviors that are undesirable such as IPV (Pesando 2021). With access to ICT, women can join social media platforms where they learn that violence cannot be tolerated. With ICT, women have a platform where they can learn through radio, television, and the Internet about violence against women (Pesando 2021). Through access to ICT, women can inform family members or report IPV, and they can receive support from others. In addition, ICT contributes to changing women's attitudes about their rights and role in society. In India, for example, the introduction of cable television changed the status of the women in rural areas, and led to an increase in decision making within households, and a decrease in fertility and acceptance of wife beating (Jensen and Oster 2009). However, there is some evidence that some of the violence that women experience is linked to exposure to information communication technologies (USAID n.d.) and being empowered. Little is known about ownership of ICT and intimate partner violence among women in sub-Saharan Africa.

Ownership of ICTs such as computers, the internet, mobile phones, and tablets is increasing worldwide. The rapid growth of ICTs is driving social change in many ways (Cardoso and Sorenson 2017). Access to ICTs contributes to the empowerment of women through changing their attitudes about their rights and role in society (Cardoso and Sorenson 2017). In efforts to reduce violence against women, ICTs are being used in awareness campaigns and community-based training to address gender inequalities. The fact that ICTs provide access to new information may contribute to changes in how women view life and can alter the traditional values and norms. Studies have shown that through ICTs, women are exposed to both online and offline gender-based violence (Sambasivan et al. 2019; USAID n.d.).

Studies that have focused exclusively on ICTs and IPV in the region are scarce. The existing studies have focused on ICTs and the justification of wife-beating by using the UNICEF's Multiple Indicator Cluster Surveys (Cardoso and Sorenson 2017). That study found that ownership of any ICT was associated with an increased likelihood of rejecting wife-beating, with the greatest association being reported by women from homes with a computer. This study is different from other studies because it looks at the actual experiences of physical and sexual violence among women who have access to ICT. None of the existing studies has looked at the association of ICT ownership with intimate partner violence.

Exposure to ICTs is increasingly becoming common among women in the world today, which is largely being driven by technology (USAID n.d.). Some studies in the United States have shown that ICT facilitated offline violence perpetrated by current or former intimate partners. It is important to focus on a multi-country study of IPV because the sub-Saharan Africa region has one of the higher levels of IPV in the world. Studies have shown that there are variations in IPV across the region that depend on contextual factors (Cools and Kotsadam 2017; True 2012). Thus, there is need to conduct a study that examines those variations based on ownership of ICT. This paper describes the variation in IPV prevalence in four sub-Saharan Africa countries—Angola, Mali, Uganda, and Zambia. The research examines the relationship between ICT ownership and IPV. The study uses Demographic and Health Survey (DHS) data on women's experience of violence from four countries in sub-Saharan Africa.

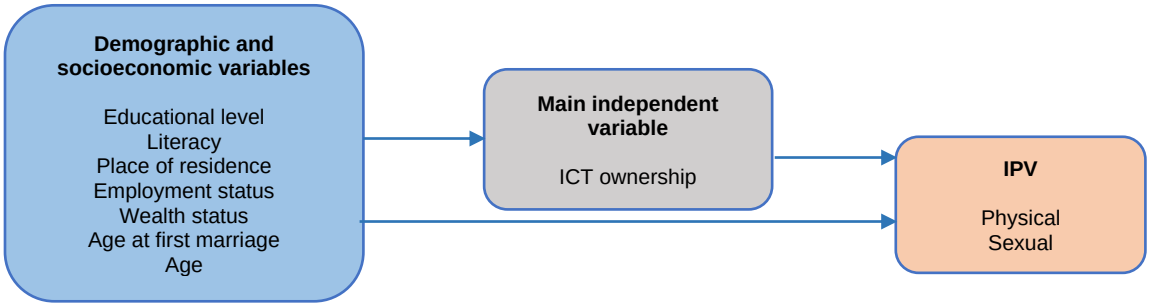
1.1 Research Question

This study addressed the following research questions:

- What are the levels of intimate partner violence by ICT ownership among women in sub-Saharan Africa?
- What is the association between ICT ownership and intimate partner violence among women in Sub-Saharan Africa?

1.2 Conceptual Framework

Figure 1 Conceptual framework that illustrates the relationship between access to ICT and intimate partner violence



Demographic and socioeconomic variables can have a direct influence on IPV. Studies have shown that age, place of residence, educational level, wealth status, employment status, children ever born, and age at first marriage are associated with experiences of IPV among women in the region. The conceptual framework illustrates that demographic and socioeconomic characteristics interact with ownership of ICT to influence physical or sexual violence.

2 DATA AND METHODS

2.1 Data Source

Data for this study were derived from the most recent DHS conducted in four countries in sub-Saharan Africa: Angola (2016 DHS), Mali (2018 DHS), Uganda (2016 DHS), and Zambia (2018 DHS). The Demographic and Health Survey (DHS) program is a nationally representative household survey conducted in most developing countries by the national statistics agencies with support from global partners such as ICF International and the United States Agency for International Development (USAID). The DHS uses standardized questionnaires to collect data, including a Household Questionnaire, a Woman's Questionnaire, a Man's Questionnaire, and a Biomarker Questionnaire (DHS program 2021). A detailed description of the methods used in these surveys is included in the respective country survey report (Croft et al. 2018). The data collected in the DHS surveys include background characteristics, marriage and sexual activity, fertility, family planning, maternal and child health, nutrition, HIV/AIDS, and domestic violence. Our study used the module on domestic violence, which is included in the individual women recode file (IR). The DHS datasets are publicly available from the DHS website https://dhsprogram.com/ (Croft et al. 2018).

The domestic violence module was administered to one randomly selected woman of reproductive age in each household. Depending on the country sample size, the total number of women who answered the domestic violence module varies. The women were asked about their domestic violence experiences. Because we focused on IPV, we restricted our analysis to women age 15–49, who were either currently married or were formerly married at the time of the survey. The sample of women in this analysis was restricted to those who completed the domestic violence module. The total sample of women in this study includes N = 7,669 for Angola, N = 3,356 for Mali, N = 7,530 for Uganda, and N = 7,355 for Zambia.

2.2 Study Variables

2.2.1 Dependent variables

The dependent variable for this study is IPV and, more specifically, two forms of violence—physical and sexual. The DHS assessed IPV in two forms. The first was the proportion of women who ever experienced violence, and the second captured those who experienced violence in the past 12 months prior to the survey. For this analysis, we adopted a more recent measure. Thus, our dependent variable was the experience of physical and sexual experience in the past 12 months. Physical violence included any of the following acts: being pushed, slapped, punched with a fist, kicked, strangled, threatened by knife, and arm twisted. All these variables had two response categories (yes/no). Experiencing any of the seven acts of physical violence was classified as having experienced physical violence. Sexual violence included any of the following acts: ever been physically forced into unwanted sex and forced into unwanted sexual acts. The experience of being forced into any of the sexual acts qualified the respondent as having experienced sexual violence.

2.2.2 Independent variables

The main independent variable is ownership of ICT, which was assessed by ownership of a mobile phone, television, or radio, and access to the internet.[1] These ICT devices are now widely used as platforms to receive information on social support and advice about dealing with IPV. Multiple correspondence analysis, which is used to analyze nominal categorical data, was used to create an ICT composite variable that would measure the proportion of women who own at least one ICT device or have access to the internet. This variable ownership of an ICT device was constructed as a binary variable (yes/no). A composite variable was generated by combining the four individual variables. The study controlled for the following predictor variables: age of the woman, educational level, place of residence, household wealth quintile, employment status, children ever born, and age at first marriage. Multicollinearity was assessed for all the predictor variables to separate the independent effects of the interrelated variables.

2.3 Statistical Analysis

Statistical analysis was performed using Stata version 17 software and considered survey design, cluster effect, and post-stratification weights in DHS datasets. Statistical analysis was conducted in three stages. In the first stage, a univariate analysis was conducted to describe variations in the prevalence of IPV among women in sub-Saharan Africa countries with a series of frequencies and percentage distributions. Bivariate analysis was then performed through cross-tabulation of the main independent variable (ICT ownership) and other predictor variables with the outcome variable using the Pearson's chi-squared test. Finally, a univariate and a multivariate binary logistic regression analysis was performed between ICT ownership and IPV, while controlling for other independent variables. Unadjusted odds ratios (*UOR*) and adjusted odds ratios (*AOR*) with corresponding p values were calculated.

In this study, we analyzed the association between ICT ownership and the experience of physical and sexual violence separately. We did not expect ICT ownership to affect physical and sexual violence in the same way among women of reproductive age. Separate univariate and multivariate logistic regression models were performed for each outcome.

2.4 Ethical Consideration

Permission to use the country datasets for Angola, Mali, Uganda, and Zambia was obtained from the DHS Program. There was no need to seek any ethical approval for the secondary analysis because all ethical protocols were fulfilled by ICF International and the country's statistic agencies during the initial stages of the primary data collection (DHS program 2021).

[1] DHS collected data on ICT devices as ownership of mobile phone; ownership of television; ownership of radio; and access to the Internet.

3 RESULTS

3.1 Background Characteristics of Respondents

Table 1 shows the background characteristics of women in the study. The majority of the women live in rural areas in Uganda (77%), Zambia (59%), and Mali (78%). In Angola, a greater proportion (64%) of the women resided in urban areas. With education, the highest number of women without education was in Mali (71.9%), followed by Angola with 28.3%. In Uganda and Zambia, women without education were 12.9% and 10.2%, respectively. The percentage of women who have a secondary education or more is highest in Zambia (39%) and lowest in Mali (15%), while the majority of women in the four countries have primary education and lower (67%, 73%, 61%, and 85%, respectively). Literacy was highest in Uganda (61%) and lowest in Mali (21%).

Table 1 Percent distribution of currently married/formerly married women (age 15–49) by background characteristics in Angola, Uganda, Zambia, and Mali

Background characteristics	Angola DHS 2016 (N = 7,669)	Uganda DHS 2016 (N = 7,530)	Zambia DHS 2018 (N = 7,355)	Mali DHS 2018 (N = 3,356)
Age				
15–19	7.3	7.3	4.8	10.3
20–24	19.4	21.0	17.6	16.7
25–29	20.7	19.2	19.8	21.5
30–34	16.5	17.8	18.3	19.0
35–39	14.3	14.6	17.3	14.9
40–44	13.1	10.9	12.7	10.3
45–49	8.6	9.2	9.5	7.3
Residence				
Urban	64.2	23.5	41.5	22.5
Rural	35.8	76.5	58.5	77.5
Education level				
None	28.3	12.9	10.2	71.9
Primary	38.2	60.0	50.5	13.1
Secondary	29.4	20.0	34.2	13.3
Higher	4.1	7.1	5.0	1.6
Literacy				
Illiterate	51.2	38.7	40.7	78.8
Literate	48.8	61.3	59.3	21.2
Wealth status				
Poor	40.0	39.7	40.0	39.0
Middle	21.2	19.6	19.2	20.6
Rich	38.8	40.6	40.7	40.4
Employment status				
Not working	24.7	15.2	38.2	38.3
Working	75.3	84.8	61.8	61.7
Children ever born				
0	3.8	5.6	3.5	7.6
1–2	29.1	30.3	32.9	26.2
3–4	29.5	24.8	29.2	26.4
5+	37.6	39.2	34.5	39.8
Age at first marriage				
Less than 15	12.4	12.6	9.9	19.7
16–19	49.0	57.2	58.1	58.4
20–24	25.5	22.8	23.3	16.7
25 +	13.1	7.4	8.7	5.2
ICT ownership				
No	25.7	26.8	29.3	15.1
Yes	74.3	73.2	70.7	84.9

With ICT ownership, measured by ownership of a mobile phone, radio, television and internet access, use was higher in Mali (84.9) compared with Angola (74.3%), Uganda (73.2%), and Zambia (70.7%). The level of wealth status did not vary by country, with the percentages approximately the same for poor, middle, and rich for Angola (40%, 21% and 39%), Uganda (40%, 20% and 41%), Zambia (40%, 19% and 41%), and Mali (39%, 21% and 40%). The majority (60%) of women in the four countries were in the middle wealth status or higher. A greater proportion of the women in Angola (75%), Uganda (85%), Zambia (62%), and Mali (62%) were working at the time of the survey.

3.2 Description of Women Who Experienced Intimate Violence by Ownership of ICT and Country

Figure 2 shows that the proportion of women who experienced physical violence was lower among women who owned ICT devices such as mobile phones, radio, television and internet access compared to those who did not own the ICT devices. However, among women who owned ICT devices in the four countries, higher reports of physical violence were reported in Angola (25%) and the fewest reports in Mali (18%). In Uganda and Zambia, the reports of physical violence (20%) were similar for women who owned ICT devices. Uganda had the highest reports of physical violence (29%) among women who did not own ICT devices, while in Angola and Zambia, the reports of physical violence (24%) were similar for women who did not own the ICT devices. In Mali, physical violence was 19% among women who did not own ICT devices.

Figure 2 **Percent distribution of women who experienced physical violence in past 12 months by country and ownership of ICT in sub-Saharan Africa countries**

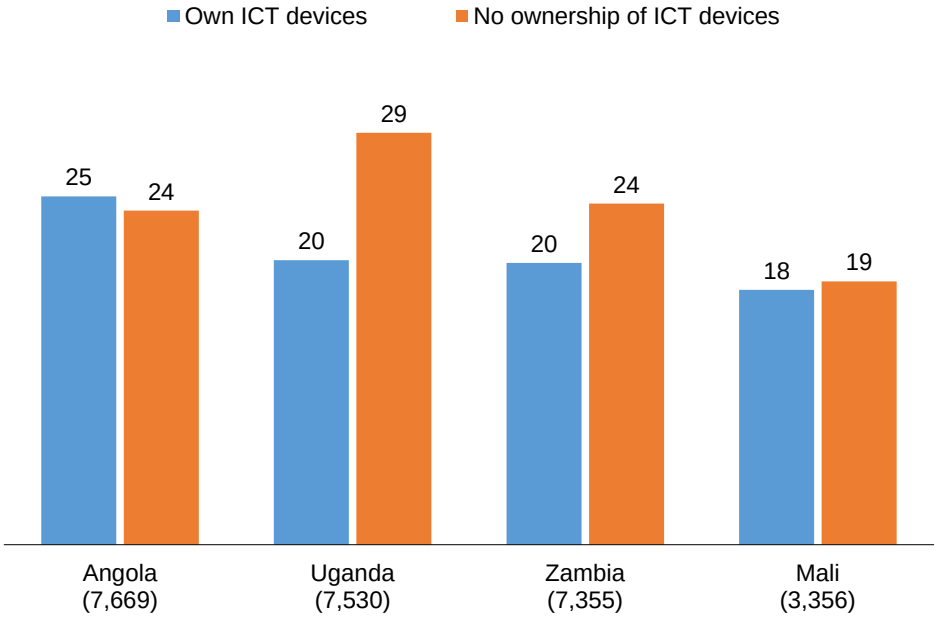
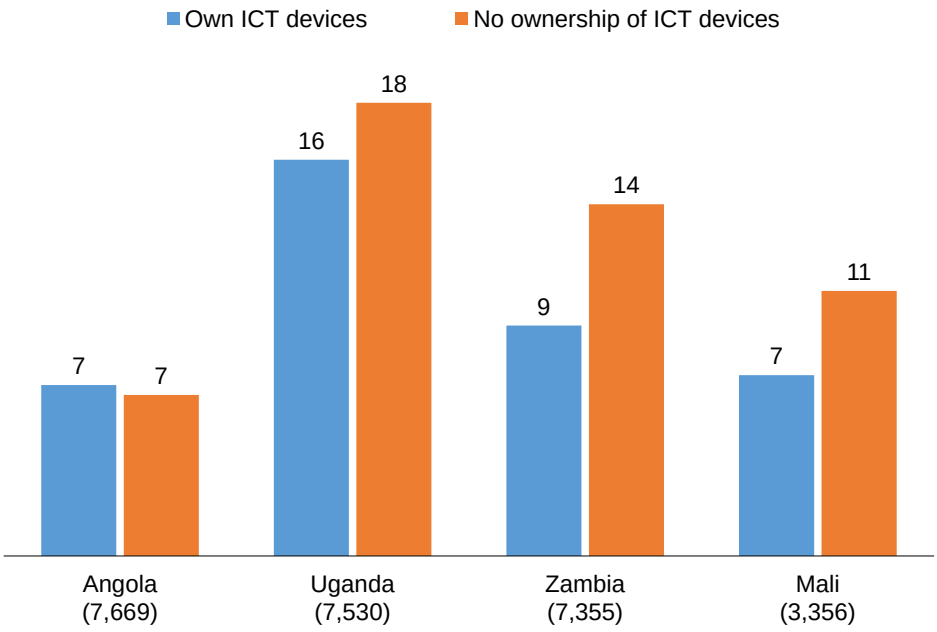


Figure 3 shows that the proportion of women who experienced sexual violence was lower among those who owned ICT devices compared to those who did not own the ICT devices. In the four countries, among women who owned the ICT devices, higher reports of sexual violence were in Uganda (16%) followed by Zambia with 9%, and the lowest number of reports were in Angola and Mali at 7%. In both Mali and Angola, the women who owned ICT devices had a similar number of reports of sexual violence. Uganda had the

greatest proportion of women who experienced sexual violence, which was 18% among women who did not own ICT devices. Among women who did not own ICT devices in the four countries, the highest number of reports of sexual violence was in Uganda (18%), followed by Zambia with 14%, and Mali at 11%. The lowest number of reports among the four countries of sexual violence among women who did not own the ICT devices was in Angola at 7%. In Angola, the proportion of women who experienced sexual violence was the same for those who owned ICT devices and those who did not own ICT devices. (For further information on the distribution of women who experienced intimate partner violence by ownership of ICT devices in sub-Saharan Africa countries, see Appendix Table 1.)

Figure 3 Percent distribution of women who experienced sexual violence in past 12 months by country and ownership of ICT in sub-Saharan Africa countries



3.3 Bivariate Analysis

Table 2 shows the bivariate analysis of the association between each independent variable and type of IPV among women in Angola, Uganda, Zambia, and Mali from 2016 to 2018. In all four countries age was significantly associated with experiences of physical violence, while in three countries— Angola, Mali, and Uganda—it was significantly associated with sexual violence. In all four countries, the experiences of physical violence were high among women age 15–19, 20–24, 25–29, 30–34, and 35–39. At the age of 40–44 and 45–49, in all the countries the reports of physical violence were low. The experiences of sexual violence were lower than physical violence in three countries—Angola, Mali, and Uganda. The reports of sexual violence were also low among older women of age 40–44 and 45–49.

Table 2 Percent distribution of women who experienced intimate partner violence in the last 12 months by background factors in sub-Saharan Africa countries

	Angola DHS 2016 (N = 7,669)		Uganda DHS 2016 (N = 7,530)		Zambia DHS 2018 (N =7,355)		Mali DHS 2018 (N = 3,356)	
Background characteristics	**Physical violence**	**Sexual violence**	**Physical violence**	**Sexual violence**	**Physical violence**	**Sexual violence**	**Physical violence**	**Sexual violence**
Age	***	***	***	*	*	ns	**	**
15–19	23.4	6.1	23.5	16.8	22.9	11.4	17.9	11.4
20–24	30.8	10.1	25.4	18.7	24.4	12.7	21.4	9.3
25–29	26.5	7.3	22.9	17.5	22.3	10.6	20.8	8.2
30–34	23.0	7.3	21.9	18.2	22.3	10.2	19.7	8.8
35–39	23.4	5.4	22.8	14.9	19.2	11.2	14.8	7.5
40–44	19.3	3.8	18.8	14.0	18.2	8.7	14.3	2.2
45–49	16.7	4.5	19.6	12.7	16.4	10.2	10.6	3.9
Residence	ns	ns	***	***	ns	ns	ns	ns
Urban	25.2	7.0	17.3	18.4	21.2	9.7	15.5	7.9
Rural	22.7	6.4	24.1	24.3	21.0	11.5	18.8	7.8
Education level	ns	ns	***	***	**	***	ns	**
None	25.0	7.0	25.3	13.4	21.5	11.2	17.6	7.1
Primary	23.1	6.2	25.2	19.2	22.9	12.4	19.2	12.6
Secondary	25.8	7.6	17.9	14.5	20.0	9.0	20.5	7.3
Higher	20.8	5.3	7.7	7.0	9.8	4.8	6.6	3.1
Literacy	ns	ns	***	ns	**	***	ns	ns
Illiterate	24.7	6.8	26.8	17.6	23.2	13.6	18.2	7.7
Literate	24.0	6.8	19.9	16.0	19.6	8.8	17.1	7.6
Wealth status	ns	ns	***	***	**	*	ns	ns
Poor	23.6	6.8	29.0	17.5	22.9	12.8	16.9	8.0
Middle	26.4	7.8	23.7	20.8	22.5	10.2	19.3	8.2
Rich	23.9	6.2	15.7	13.8	18.7	9.1	18.6	7.4
Employment status	ns	ns	ns	**	ns	ns	ns	*
Not working	25.4	7.0	21.7	13.0	21.5	10.3	16.1	5.9
Working	24.0	6.7	22.7	17.3	20.9	10.9	19.3	9.0
Children ever born	ns	ns	***	ns	ns	ns	ns	ns
0	26.1	5.8	13.8	14.5	20.9	6.4	16.1	9.1
1–2	25.4	6.8	21.5	15.3	20.7	10.9	20.0	9.7
3–4	26.0	8.7	24.9	17.8	22.7	9.9	19.7	6.6
5+	22.0	5.3	23.0	17.2	20.2	11.8	ns	7.1
Age at first marriage	*	ns	***	**	*	**	ns	*
Less than 15	26.3	7.3	25.7	16.4	22.5	13.5	19.0	6.6
16–19	24.0	7.2	24.9	18.1	22.6	11.7	18.4	8.8
20–24	26.2	5.8	16.6	13.9	17.7	8.0	17.3	7.2
25 +	20.2	6.5	16.9	14.0	18.6	8.5	12.9	2.6
ICT ownership	ns	ns	***	*	*	***	ns	ns
No	23.6	6.5	29.1	18.3	24.1	14.2	18.6	10.7
Yes	24.6	6.9	20.1	16.0	19.9	9.3	18.0	7.3
Total	24.3	6.8	22.5	16.6	21.1	10.8	18.1	7.8

* Significant at p <.05; ** significant at p < .01; significant at *** p < .001; ns = non-significant

Wealth status was significantly associated with both physical and sexual violence in two countries—Uganda and Zambia. In Uganda, women whose wealth status is poor and middle had greater reports of physical violence, 29% and 23.7% respectively, than women classified as rich, whose reports were 15.7%. Also in Uganda, women whose wealth status is poor and middle had higher reports of sexual violence, 17.5% and 20.8%, compared with the rich women with 13.8%. Similarly, in Zambia, higher reports of physical and sexual violence were found among women whose wealth status was poor and middle while lower among the rich women.

Out of the four countries, place of residence was significantly associated with physical and sexual violence in Uganda. Women in urban areas of Uganda had lower reports of physical violence (17.3%) and sexual violence (18.4%) than their counterparts in rural areas, with 24.1% reports of physical violence and 24.3% reports of sexual violence.

The level of education was significantly associated with physical and sexual violence in Uganda and Zambia, while in Mali it was significantly associated with sexual violence. Women in Uganda who had no education or with primary and secondary education had higher reports of physical violence – 25.3%, 25.2%, and 17.9% respectively – than women with higher education, 7.7%. Women who experienced sexual violence were higher among those with no education or with primary and secondary education, with 13.4%, 19.2% and 14.5% respectively, compared with those with higher education, 7%. Also, in Zambia women who experienced physical and sexual violence were high in the three categories: those without education, and with primary and secondary education, compared to those with higher education. It was only in Zambia where literacy was significantly associated with both physical and sexual violence, while in Uganda it was significantly associated with physical violence. In Zambia, women who are illiterate constituted greater reports of physical (23.2%) and sexual (13.6%) violence than their counterparts who were literate, with 19.6% reporting physical and 8.8% sexual violence. In Uganda, women who are illiterate had higher reports of physical violence (26.8%) than literate women (19.9%).

It was only in Uganda and Mali where employment status was significantly associated with sexual violence. In Uganda, women who were working had higher reports of sexual violence (17.3%) than women who were not working (13%). Also, in Mali higher reports of sexual violence were among the working women (9%) compared with those not working (6%). Out of the four countries, children ever born was significantly associated with physical violence in Uganda. Women in Uganda who had 3–4 children had higher reports of physical violence, 24.9%, followed by those with more than 5 children with 23%, and 21.5% reports among women with 1–2 children. There were low reports among women without children, 13.8%. The reports of sexual violence were also high among women with children and slightly lower among women with no children.

Age at first marriage was significantly associated with both physical and sexual violence in Uganda and Zambia while in Mali it was significantly associated with sexual violence. As expected, women in Uganda whose age at first marriage was less than 15 had higher reports of physical violence, 26%, followed by those whose age at first marriage was 15–19 with 25%, and those whose age was 20–24, 25 and older with 17%. Also, in Uganda, the reports of sexual violence were high among women whose age at first marriage was 15–19 with 18.1%. Those who got married at less than 15 had 16.4% reports, while lower reports were among those who got married at the age of 20–24, 25 and older with 14%. Zambia also had similar reports as Uganda where women who got married at age 15–19 and less than 15 had higher reports of physical violence (23%), and lower reports (18%) were among those who got married at age 20–24. In Mali, higher reports of physical violence were among women whose age at first marriage was less than 15 with 19%, followed by those whose age was 15–19 with 18.4%. Among women age 20–24 it was 17.3%, and lower among those whose age was 25 and older. The reports of sexual violence were high among women whose age at first marriage was less than 15, 15–19, and 20–24; reports were lower among those whose age was 25 and older.

ICT ownership was significantly associated with both physical and sexual violence in Uganda and Zambia. Women in Uganda who did not own ICT devices had higher reports of physical violence (29.1%) than women who owned ICT devices (20.1%). Reports of sexual violence were also higher among women who did not own ICT devices (18.3%) compared with women who owned the devices (16%). Also, in Zambia, higher reports of physical and sexual violence were among women who did not own ICT devices, 24.1% and 14.2% respectively, while lower reports of physical and sexual violence were among women who owned ICT devices, 20% and 9.3% respectively.

3.4 Multivariate Analyses

Table 3 shows the adjusted odds ratios of the logistic regression, which was done to examine the association between ICT ownership and intimate partner violence in the four sub-Saharan countries (Angola, Mali, Uganda, and Zambia). (For the unadjusted odds ratios, see Appendix Table 2.) As age increased, the women's likelihood of experiencing physical and sexual violence decreased. For example, in Angola, women age 45–49 were significantly less likely to experience physical violence compared with women age 15–19.

In Uganda, women in the age group 40–44 were significantly less likely to experience physical violence (*AOR* = 0.6; 95% CI: 0.40–0.99) and sexual violence (*AOR* = 06; 95% CI: 0.36–0.94), compared with women age 15–19. In Uganda, women age 45–49 were less likely to experience sexual violence compared with women age 15–19 (*AOR* = 0.5; 95% CI: 0.30–0.82). Women in rural areas of Uganda were significantly more likely to experience sexual violence than their counterparts in urban areas (*AOR* = 1.3; 95% CI: 1.03–1.60). Meanwhile, in Zambia, women in rural areas had significantly reduced odds of experiencing physical violence (*AOR* = 0.6; 95% CI: 0.47–0.77).

As expected, in three countries— Mali, Uganda, and Zambia—women with higher education were significantly less likely to experience physical violence compared with women with no education (*AOR* = 0.4; 95% CI: 0.49–0.74; *AOR* = 0.5, 95% CI: 0.24–0.89; *AOR* = 0.3; 95% CI: 0.12–0.98). Women with primary education in Uganda and Mali were significantly more likely to experience sexual violence, compared with women with no education (*AOR* = 1.4; 95% CI: 1.07–1.75; *AOR* = 1.7; 95% CI: 1.10–2.67).

Based on wealth status, women in Uganda and Zambia who are rich were significantly less likely to experience physical violence compared with women who are poor (*AOR* = 0.6; 95% CI: 0.49–0.74; *AOR* = 0.6; 95% CI: 0.48–0.84). Among the four countries, it was only in Uganda where women from a middle wealth status were significantly more likely to experience sexual violence compared with women from the poor wealth status (*AOR* = 1.3; 95% CI: 1.07–1.63). In terms of employment status, women who were working in Mali were significantly more likely to experience both physical and sexual violence compared with women who were not working (*AOR* = 1.3; 95% CI: 1.04–1.70; *AOR* = 1.7; 95% CI: 1.18–2.41). In Uganda, the working women had significantly increased odds of experiencing only sexual violence than women who were not working (*AOR* = 1.4; 95% CI: 1.10–1.80).

Table 3 Adjusted odds ratios for the binary logistic regression of the association between all independent variables with intimate partner violence in last 12 months

Background characteristics	Angola DHS 2016 (N = 7,669)				Uganda DHS 2016 (N = 7,530)				Zambia DHS 2018 (N = 7,355)				Mali DHS 2018 (N = 3,356)			
	Physical violence		Sexual violence		Physical violence		Sexual violence		Physical violence		Sexual violence		Physical violence		Sexual violence	
	AOR	95% CI	*AOR*	95% CI	*AOR*	95% CI	*AOR*	95% CI	*AOR*	95% CI	*AOR*	95% CI	*AOR*	95% CI	*AOR*	95% CI
Age																
15–19 (Ref)																
20–24	1.36	0.97–1.93	1.48	0.86–2.54	1.08	0.78–1.49	1.15	0.83–1.59	1.15	0.79–1.67	1.13	0.72–1.78	1.22	0.76–1.94	0.85	0.45–1.61
25–29	1.06	0.71–1.57	0.95	0.53–1.71	0.91	0.63–1.31	0.94	0.65–1.37	0.98	0.67–1.43	1.02	0.60–1.74	1.18	0.71–1.97	0.76	0.40–1.47
30–34	0.85	0.55–1.31	0.92	0.49–1.72	0.81	0.56–1.17	0.89	0.59–1.36	0.96	0.62–1.50	0.93	0.53–1.63	1.18	0.68–2.06	0.79	0.34–1.88
35–39	0.86	0.54–1.39	0.68	0.35–1.35	0.83	0.55–1.26	0.65	0.42–1.02	0.77	0.48–1.23	0.97	0.54–1.76	0.85	0.45–1.62	0.62	0.22–1.71
40–44	0.67	0.40–1.12	0.46	0.21–1.03	0.63*	0.40–0.99	0.58*	0.36–0.94	0.71	0.44–1.17	0.70	0.35–1.38	0.81	0.39–1.68	0.18**	0.06–0.52
45–49	0.58*	0.34–0.99	0.56	0.24–1.31	0.67	0.43–1.05	0.49**	0.30–0.82	0.61	0.36–1.06	0.79	0.41–1.53	0.57	0.29 - 1.15	0.33	0.09 - 1.24
Residence																
Urban (Ref)																
Rural	0.79	0.63–1.01	0.77	0.55–1.08	0.99	0.81–1.22	1.28*	1.03–1.60	0.60***	0.47–0.77	0.91	0.58–1.42	1.50	1.00–2.25	0.82	0.43–1.57
Education level																
None (Ref)																
Primary	0.85	0.71–1.02	0.82	0.61–1.12	0.97	0.79–1.19	1.37*	1.07–1.75	1.07	0.84–1.37	1.18	0.88–1.58	1.01	0.72–1.42	1.72*	1.10–2.67
Secondary	0.91	0.70–1.17	1.05	0.72–1.52	0.79	0.60–1.03	1.06	0.77–1.45	0.92	0.69–1.24	0.98	0.70–1.39	1.08	0.76–1.51	0.92	0.58–1.47
Higher	0.78	0.43–1.42	0.90	0.39–2.08	0.40***	0.26–0.61	0.56	0.31–1.00	0.46*	0.24–0.89	0.56	0.29–1.08	0.34*	0.12–0.98	0.44	0.10–1.88
Wealth status																
Poor (Ref)																
Middle	1.00	0.78–1.27	0.91	0.62–1.34	0.85	0.70–1.04	1.32**	1.07–1.63	0.91	0.74–1.13	0.81	0.61–1.09	1.18	0.87–1.60	1.04	0.69–1.57
Rich	0.89	0.66–1.20	0.71	0.44–1.13	0.60***	0.49–0.74	1.05	0.82–1.34	0.64**	0.48–0.84	0.92	0.53–1.62	1.39	0.99–1.95	0.94	0.51–1.72
Employment status																
Not working (Ref)																
Working	1.04	0.85–1.26	1.08	0.80–1.45	1.04	0.85–1.27	1.40**	1.10–1.80	1.04	0.89–1.22	1.13	0.90–1.42	1.33*	1.04–1.70	1.69**	1.18–2.41
Children ever born																
0 (Ref)																
1–2	0.85	0.59–1.24	1.10	0.62–1.94	1.79**	1.23–2.61	1.09	0.75–1.59	0.97	0.63–1.50	1.71	0.99–2.93	1.18	0.73–1.93	1.21	0.60–2.45
3–4	0.98	0.65–1.48	1.65	0.90–3.05	2.26***	1.48–3.45	1.38	0.91–2.10	1.17	0.75–1.84	1.63	0.88–3.00	1.16	0.65–2.08	0.86	0.36–2.06
5+	0.99	0.64–1.51	1.37	0.72–2.62	2.02**	1.30–3.13	1.64*	1.04–2.59	1.11	0.69–1.81	2.00	1.00–3.99	1.02	0.53–1.95	1.14	0.42–3.10
Age at first marriage																
Less than 15 (Ref)																
16–19	0.87	0.70–1.07	0.97	0.67–1.39	0.99	0.80–1.21	1.13	0.89–1.43	1.05	0.80–1.38	0.89	0.65–1.22	0.98	0.72–1.34	1.53	0.99–2.36
20–24	1.03	0.80–1.33	0.84	0.55–1.28	0.77*	0.61–0.97	1.04	0.79–1.38	0.84	0.62–1.15	0.65*	0.46–0.92	0.94	0.62–1.42	1.46	0.83–2.58
25+	0.85	0.62–1.16	1.18	0.72–1.94	0.87	0.60–1.24	1.19	0.79–1.78	1.07	0.73–1.56	0.80	0.50–1.27	0.83	0.47–1.47	0.65	0.24–1.73
ICT ownership																
No (Ref)																
Yes	1.04	0.86–1.26	1.12	0.83–1.52	0.86	0.74–1.01	0.95	0.79–1.13	0.89	0.74–1.08	0.73**	0.58–0.92	0.90	0.66–1.23	0.62*	0.41–0.93

* Significant at $p < .05$; ** significant at $p < .01$; significant at *** $p < .001$

Only in Uganda were children ever born significantly associated with experiences of both physical and sexual violence. Women in the country who had 1–2 and 3–4 children had an increased likelihood of experiencing physical violence compared with women with no children (*AOR* = 1.8; 95% CI: 1.23–2.61; *AOR* = 2.3; 95% CI: 1.48–3.45). Women with more than five children were significantly more likely to experience both physical and sexual violence than women with no children (*AOR* = 2.0; 95% CI: 1.30–3.13). The association of age at first marriage with intimate partner violence was statistically significant in two countries—Uganda and Zambia. Women in Uganda whose age at first marriage was between 20–24 were significantly less likely to experience physical violence compared with women whose age at first marriage was younger than 15 (*AOR* = 0.8; 95% CI: 0.61–0.97). Also, in Zambia, women whose age at first marriage was between 20–24 had a significantly lower likelihood of experiencing sexual violence, compared with women whose age at first marriage was less than 15 (*AOR* = 0.7; 95% CI: 0.46–0.92). Ownership of ICT devices was significantly associated with sexual violence in two countries out of the four. In Zambia and Mali, women who owned ICT devices were significantly less likely to experience sexual violence compared with women who did not own ICT devices (*AOR* = 0.7; 95% CI: 0.58–0.92; *AOR* = 0.6; 95% CI: 0.41–.0.93).

In the four countries, the determinants that influenced physical and sexual violence varied. In Angola, only age was significantly associated with physical violence, while in Uganda, it was age, educational level, wealth status, children ever born, and age at first marriage. In Zambia, the determinants that were significantly associated with physical violence were place of residence, educational level, and wealth status. In Mali, it was educational level and employment status. Educational level in Zambia, Mali, and Uganda was associated with physical violence. Age and wealth status are consistently associated with physical violence in two countries—Uganda and Zambia.

None of the determinants were associated with sexual violence in Angola. Among the four countries, Angola presented a different situation that requires further examination of the determinants of both sexual and physical violence in the country. In Uganda, age, place of residence, educational level, wealth status, employment status, and children ever born were significantly associated with sexual violence. Meanwhile, in Zambia, age at first marriage and ICT ownership were significantly associated with sexual violence. In Mali, it was age, educational level, employment status, and ICT ownership that were significantly associated with sexual violence. Uganda and Mali share the most determinants of sexual violence such as age, educational level, and employment status.

4 DISCUSSION

The main objective of the study was to examine the association between ownership of ICT devices and IPV among women in four countries in sub-Saharan Africa. The results reveal that the relationship between ICT ownership and intimate partner violence is inconsistent and appears to be country specific. The study showed that women in Zambia and Mali who own ICT devices were significantly less likely to experience sexual violence compared to those who did not own ICT devices. Ownership of ICTs may facilitate the empowerment of women through exposing them to economic and networking opportunities, political participation, and skill building (Cardoso and Sorenson 2017). This reduces financial dependence of the women on their partners (Cardoso and Sorenson 2017). This might explain why there are reduced experiences of sexual violence among women who own ICT devices. For example, in an Amazonian community, the introduction of a television changed individuals' perception of gender and gender roles (Cardoso and Sorenson 2017). Such changes might explain why women who own ICT devices are less likely to experience IPV because they become aware of life outside of their homes, and learn that violence against women is wrong and should not be accepted. However, some studies have shown that ownership of ICT is being used to facilitate violence against women by their intimate partners because the partners can control and monitor women through ICT devices such as phones (Madanda et al. 2009; Dimond et al. 2011).

In Zambia and Mali, women who owned ICT devices were significantly less likely to experience sexual violence than those who did not own the ICT devices. This may indicate that in some cases, women who own ICT devices such as mobile phones are more intolerant to domestic violence. There is some evidence that women from households with ICT devices such as a mobile phone or a computer rejected wife beating (Cardoso and Sorenson 2017). However, the study by Lee (2009) does not specify the type of domestic violence which the women did not accept. This could explain why women in Zambia and Mali who own ICT devices reported reduced experiences of sexual violence compared to those who do not own the devices. Ownership of ICTs may facilitate the empowerment of women by exposing them to economic and networking opportunities, political participation, and skills building (Cardoso and Sorenson 2017). This reduces financial dependence of the women on their partners (Cardoso and Sorenson 2017). This might explain why there are reduced experiences of sexual violence among women who have access to ICT.

The results showed that women age 45–49 had generally lower odds of experiencing both sexual and physical violence in the past 12 months compared with females age 15–19. This is consistent with studies that have indicated that as age increases, the experiences of physical violence decrease among older females (Pathak et al. 2019). As expected, women in Mali between age 40–44 had a significantly lower likelihood of experiencing sexual violence. This shows that as women age, their experiences of IPV decrease, which is in agreement with studies in sub-Saharan Africa.

In this study, education appears to protect women from physical and sexual violence. However, this is not consistent across individual educational levels. In Uganda, Zambia, and Mali, women with higher education were less likely to experience physical violence compared to women with no education. This agrees with studies that have shown that women with higher levels of education are less likely to experience physical or sexual violence. However, women in Uganda and Mali with primary level education were significantly more likely to experience sexual violence compared to women with no education. This is consistent with studies that have shown that women with low levels of education experience IPV that might be linked to

their financial dependence on their partners (Rapp et al. 2012; Weitzman 2018). Women with a rich wealth status in Uganda and Zambia had a reduced likelihood of experiencing physical violence compared to those who are poor. Only in Uganda were women from a middle wealth status more likely to experience physical violence compared to women who are poor.

Women in Uganda who are employed were significantly less likely to experience sexual violence than unemployed women. In Mali, employed women had an increased likelihood of experiencing both physical and sexual violence compared to unemployed women. This is consistent with studies that have shown that women who are employed tend to be independent and able to voice their opinions within a relationship, which exposes them to an increased risk of IPV (Castro et al. 2008; Dalal 2011; Vyas and Watts 2009). Traditionally, men are expected to be breadwinners in the region, but due to changing gender roles women are becoming breadwinners, which can be threatening to the masculine nature of men. Exercising violence over women can be a means to restore their superiority and control them.

The number of children women in Uganda had did not protect women from experiencing IPV. Women who have 1–2, 3–4, and 5 or more children were more likely to experience physical violence. Women who had 5 and more children experienced both physical and sexual violence in Uganda. Women in Uganda whose age at first marriage was between 20–24 were significantly less likely to experience physical violence than those who were younger than age 15. In Zambia, women age 20–24 were less likely to experience sexual violence compared with women younger than age 15.

5 CONCLUSION

The ownership of ICT is associated with lower levels of IPV, even after controlling for other factors known to be associated with IPV. The strength of this relationship varies across countries and types of IPV. The findings show that ownership of ICT by women protects them from experiencing sexual violence in two countries—Zambia and Mali. As the women increasingly own ICT devices, they learn from others and social media about the ideal man. Through ownership of ICT devices, women's attitudes towards existing norms and values, which support patriarchal practices, may change as the women are exposed to new ways of life, which are focused on addressing gender inequalities. This could possibly mean that the women who own ICT can learn about violence against women and decide not to tolerate it. Thus, ICT can be used in IPV interventions to raise awareness, and as a channel for women to communicate or report any practices related to IPV. In Uganda and Angola, ownership of ICT was not associated with experiences of sexual or physical violence. This could mean that there are other factors that explain IPV.

This study has a number of limitations. First, the ownership of ICT devices in the household does not mean that women have access to ICT. The ICT might be available within the home, but the woman might not be able to use it. The study is cross-sectional, which makes it impossible to infer causality. We are unable to detect the direction of the association between ICT ownership and IPV. However, the study's findings are important in the formulation of policies and programs aimed at addressing violence against women. Access to ICT should be promoted among women given the findings that women who own ICT devices reported lower levels of sexual violence. This shows that ICT may be raising awareness and offering women a platform for social support and advice about IPV. The spread of ICTs within the region might be leading to positive changes in existing values and beliefs, which promote gender inequalities and expose women to abuse. Although access to ICT should be advocated for women, policy makers should be aware that women's ownership of ICT devices may cause some partners to become more violent due to the increased independence that comes with the use of the devices. Future research should be conducted to explore why some women who have access to ICT are not experiencing IPV. Such understanding can be used to enhance policies that reduce violence against women.

REFERENCES

Bonnes, S. 2016. “Education and Income Imbalances Among Married Couples in Malawi as Predictors for Likelihood of Physical and Emotional Intimate Partner Violence.” *Violence and Victims* 31 *(*1): 51–70. http://dx.doi.org/10.1891/0886-6708.vv-d-14-00016

Bramon, B. 2018. “Transformative Technology: Harnessing the Power of Tech to Address Gender-Based Violence in Latin America and The Caribbean.” Washington, DC: US Department of State. https://blogs.state.gov/stories/2017/12/04/en/transformative-technology-harnessing-power-tech-address-gender-based-violence

Cardoso, L. F., and S. B. Sorenson. 2017. “Violence Against Women and Household Ownership of Radios, Computers, and Phones in 20 Countries.” *American Journal of Public Health* 107 (7): 1175–1181. https://doi.org/10.2105/ajph.2017.303808

Castro, R., I. Casique, and C. D. Brindis. 2008. “Empowerment and Physical Violence Throughout Women’s Reproductive Life in Mexico.” *Violence against Women* 14 (6): 655–677. https://psycnet.apa.org/doi/10.1177/1077801208319102

Cools, S., and A. Kotsadam. 2017. “Resources and Intimate Partner Violence in Sub-Saharan Africa.” *World Development* 95: 211–230. https://doi.org/10.1016/j.worlddev.2017.02.027

Croft, T. N., M. J. Aileen, C. K. Allen, et al. 2018. *Guide to DHS Statistics*. Rockville, Maryland, USA: ICF. https://dhsprogram.com/data/Guide-to-DHS-Statistics/index.cfm

Dalal, K. 2011. “Does Economic Empowerment Protect Women from Intimate Partner Violence?” *Journal of Injury and Violence Research* 3 (1): 35–44. https://www.jivresearch.org/jivr/index.php/jivr/article/view/76

Devries, K. M., J. Y. Mak, C. Garcia-Moreno, M. Petzold, J. C. Child, G. Falder, S. Lim, L. J. Bacchus, R. E. Engell, L. Rosenfeld, et al. 2013. “The Global Prevalence of Intimate Partner Violence against Women.” *Science* 340 (6140): 1527–1528. https://doi.org/10.1126/science.1240937

DHS Program. 2021. *The DHS Program.* www.dhsprogram.com

Dimond, J. P., C. Fiesler, and A. S. Bruckman. 2011.”Domestic Violence and Information Communication Technologies.” *Interacting with Computers* 23 (5): 413–421. https://doi.org/10.1016/j.intcom.2011.04.006

García-Moreno, C., H. A. Jansen, M. Ellsberg, L. Heise, and C. Watts. 2005. *WHO Multi-Country Study on Women’s Health and Domestic Violence against Women*. Geneva: World Health Organization. https://apps.who.int/iris/handle/10665/43309

Jensen, R., and E. Oster. 2009. “The Power of TV: Cable Television and Women’s Status in India.” *The Quarterly Journal of Economics* 124 (3): 1057–1094. https://doi.org/10.1162/qjec.2009.124.3.1057

Lee, D. 2009. “The Impact of Mobile Phones on the Status of Women In India.” Doctoral Dissertation. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.647.792&rep=rep1&type=pdf

Lien, M. I., and J. Lorentzen. 2019. “Men’s Experience of Intimate Partner Violence.” In *Men’s Experiences of Violence in Intimate Relationships,* 37–82. Springer. https://doi.org/10.1007/978-3-030-03994-3

Madanda, A., B. Ngolobe, And G. Z. Amuriat. 2009. “Uganda: Violence against Women and Information and Communication Technologies.” Association for Progressive Communications. https://genderit.org/sites/default/files/uganda_apc_wnsp_mdg3_vaw_ict_ctryrpt_2.pdf

Pathak, N., R. Dhairyawan, and S.Tariq, 2019. “The Experience of Intimate Partner Violence among Older Women: A Narrative Review.” *Maturitas* 121*:* 63–75. https://doi.org/10.1016/j.maturitas.2018.12.011

Pesando, L. M. 2021. “*Safer if Connected? Mobile Technology and Intimate Partner Violence*.” *Demography* 59 (2): 653–684. https://doi.org/10.1215/00703370-9774978

Philbrick, W. C., J. R. Milnor, M. Deshmukh, and P. N. Mechael. 2021. “Protocol: The Use of Information and Communications Technologies (ICT) for Contributing to the Prevention of, and Response to, Sexual and Gender-Based Violence against Women and Children in Lower and Middle-Income Countries: An Evidence and Gap Map.” *Campbell Systematic Reviews* 17 (1): e1153. https://doi.org/10.1002/cl2.1153

Rapp, D., B. Zoch, M. M. H. Khan, T. Pollmann, and A. Krämer. 2012. “Association Between Gap in Spousal Education and Domestic Violence in India and Bangladesh.” *BMC Public Health 12* (1): 1–9. https://doi.org/10.1186/1471-2458-12-467

Sambasivan, N., A. Batool, N. Ahmed, T. Matthews, K. Thomas, L. S. Gaytán-Lugo, D. Nemer, E. Bursztein, E. Churchill, and S. Consolvo. 2019. “They Don’t Leave Us Alone Anywhere We Go - Gender and Digital Abuse in South Asia.” *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. 1–14. https://doi.org/10.1145/3290605.3300232

True, J. 2012. *The Political Economy of Violence Against Women*. Cary, NC: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199755929.001.0001

USAID. (n.d.). *Select Gender-Based Violence Literature Reviews: The Impact of Information Communication Technologies on Gender-Based Violence*. Washington, DC: USAID. https://pdf.usaid.gov/pdf_docs/PA00WR39.pdf

Vyas, S., and C. Watts. 2009. “How Does Economic Empowerment Affect Women’s Risk of Intimate Partner Violence in Low and Middle Income Countries? A Systematic Review of Published Evidence.” *Journal of International Development* 21 (5): 577–602. https://doi.org/10.1002/jid.1500

Walker, A., K. Lyall, D. Silva, G. Craigie, R. Mayshak, B. Costa, S. Hyder, and A. Bentley, A. 2020. "Male Victims Of Female-Perpetrated Intimate Partner Violence, Help-Seeking, and Reporting Behaviors: A Qualitative Study." *Psychology of Men & Masculinities* 21 (2): 213. https://psycnet.apa.org/doi/10.1037/men0000222

Weitzman, A. 2018. "Does Increasing Women's Education Reduce Their Risk of Intimate Partner Violence? Evidence from an Education Policy Reform." *Criminology* 56 (3): 574–607. https://doi.org/10.1111/1745-9125.12181

World Health Organization. (2012). *Understanding and Addressing Violence against Women: Intimate Partner Violence.* Geneva: World Health Organization. https://apps.who.int/iris/handle/10665/77432

APPENDIX TABLES

Appendix Table 1 Crosstabulation of the distribution of women who experienced intimate partner violence by ownership of ICT in sub-Saharan Africa countries

	Physical violence		Sexual violence	
Country/ICT ownership	**Y**	***p* value**	**Y**	***p* value**
Angola				
Yes	24.6	.571	6.9	.707
No	23.6		6.5	
Uganda				
Yes	20.1	.000	16.0	.038
No	29.1		18.3	
Zambia				
Yes	19.9	.002	9.3	.000
No	24.1		14.2	
Mali				
Yes	18.0	.766	7.3	.034
No	18.6		10.7	

Appendix Table 2 Unadjusted odds ratios for the binary logistic regression of the association between background characteristics with intimate partner violence in last 12 months in sub-Saharan Africa countries

Background characteristics	Angola DHS 2016 (N = 7,669)				Uganda DHS 2016 (N = 7,530)				Zambia DHS 2018 (N = 7,355)				Mali DHS 2018 (N = 3,356)			
	Physical violence		Sexual violence		Physical violence		Sexual violence		Physical violence		Sexual violence		Physical violence		Sexual violence	
	OR	95% CI	*OR*	95% CI	*OR*	95% CI	*OR*	95% CI	*OR*	95% CI	*OR*	95% CI	*OR*	95% CI	*OR*	95% CI
Age																
15-19 (Ref)																
20–24	1.46*	1.10–1.95	1.72*	1.04–2.82	1.11	0.83–1.48	1.14	0.83–1.56	1.09	0.76–1.54	1.13	0.67–1.90	1.25	0.81–1.94	0.80	0.56–1.39
25–29	1.18	0.88–1.58	1.20	0.71–2.01	0.96	0.71–1.30	1.05	0.77–1.42	0.97	0.70–1.33	0.92	0.60–1.41	1.20	0.78–1.86	0.69	0.41–1.16
30–34	0.98	0.72–1.33	1.21	0.71–2.05	0.91	0.69–1.20	1.10	0.79–1.52	0.96	0.69–1.35	0.88	0.57–1.36	1.12	0.71–1.77	0.75	0.45–1.24
35–39	1.00	0.72–1.39	0.88	0.49–1.57	0.96	0.69–1.33	0.87	0.61–1.22	0.80	0.56–1.13	0.98	0.58–1.65	0.79	0.50–1.25	0.62	0.35–1.12
40–44	0.78	0.54–1.13	0.60	0.31–1.17	0.75	0.53–1.06	0.80	0.55–1.17	0.75	0.51–1.10	0.74	0.46–1.20	0.76	0.43–1.36	0.17***	0.07–0.41
45–49	0.66	0.42–1.02	0.71	0.35–1.46	0.79	0.55–1.14	0.72	0.49–1.05	0.66	0.41–1.03	0.88	0.54–1.42	0.54*	0.29–1.00	0.31*	0.10–0.96
Residence																
Urban (Ref)																
Rural	0.87	0.71–1.07	0.91	0.69–1.09	1.52***	1.27–1.82	1.57**	1.28–1.90	0.97	0.84–1.16	1.20	0.89–1.63	1.26	0.92–1.73	0.98	0.63–1.53
Education level																
None (Ref)																
Primary	0.90	0.76–1.07	0.87	0.66–1.16	0.99	0.82–1.21	1.53***	1.21–1.93	1.08	0.86–1.36	1.12	0.83–1.52	1.11	0.79–1.57	189**	1.25–2.86
Secondary	1.04	0.83–1.30	1.10	0.81–1.51	0.64***	0.50–0.82	1.09	0.82–1.46	0.91	0.73–1.14	0.79	0.58–1.08	1.21	0.85–1.72	1.03	0.66–1.60
Higher	0.79	0.45–1.39	0.75	0.33–1.67	0.25***	0.17–0.36	0.49***	0.29–0.81	0.39**	0.22–0.71	0.40**	0.21–0.75	0.33*	0.11–0.96	0.42	0.10–1.80
Wealth status																
Poor (Ref)																
Middle	1.17	0.94–1.45	1.17	0.85–1.60	0.76**	0.63–0.92	1.23*	1.01–1.50	0.97	0.80–1.18	0.77*	0.61–0.99	1.18	0.88–1.59	1.03	0.68–1.57
Rich	1.02	0.81–1.28	0.90	0.64–1.27	0.46***	0.39–0.53	0.75**	0.62–0.90	0.77**	0.65–0.92	0.68*	0.51–0.91	1.13	0.85–1.48	0.93	0.61–1.40
Employment status																
Not working (Ref)																
Working	0.92	0.77–1.11	0.95	0.70–1.29	1.06	0.88–1.29	1.40**	1.09–1.78	1.14	0.83–1.12	1.07	0.86–1.34	1.25	0.98–1.59	1.59***	1.11–2.28
Children ever born																
0 (Ref)																
1–2	0.96	0.67–1.37	1.18	0.68–2.07	1.72**	1.19–2.46	1.07	0.74–1.53	0.99	0.63–1.54	1.79*	1.05–3.05	1.30	0.83–2.04	1.08	0.56–2.08
3–4	0.99	0.69–1.42	1.54	0.88–2.70	2.08***	1.44–3.02	1.27	0.87–1.85	1.11	0.74–1.68	1.60	0.96–2.68	1.28	0.79–2.06	0.70	0.35–1.40
5+	0.79	0.55–1.14	0.91	0.52–1.59	1.88**	1.30–2.72	1.22	0.85–1.75	0.96	0.63–1.45	1.96*	1.16–3.31	0.99	0.61–1.61	0.77	0.38–1.54
Age at first marriage																
Less than 15 (Ref)																
15–19	0.88	0.71–1.09	0.99	0.68–1.43	0.96	0.78–1.17	1.13	0.90–1.43	1.00	0.78–1.29	0.85	0.62–1.18	0.96	0.71–1.30	1.37	0.89–2.10
20–24	0.99	0.78–1.27	0.78	0.50–1.19	0.57***	0.45–0.72	0.82	0.63–1.07	0.74*	0.56–0.98	0.56**	0.40–0.78	0.89	0.60–1.33	1.10	0.66–1.82
25+	0.71*	0.54–0.94	0.88	0.53–1.46	0.59**	0.42–0.82	0.83	0.56–1.23	0.79	0.56–1.10	0.59*	0.39–0.90	0.63	0.38–1.06	0.38*	0.16–0.89
ICT ownership																
No (Ref)																
Yes	1.06	0.88–1.27	1.05	0.80–1.39	0.61***	0.53–0.70	0.85*	0.73–0.99	0.78**	0.67–0.91	0.63***	0.51–0.77	0.95	0.70–1.30	0.66*	0.44–0.97

* Significant at $p < .05$; ** significant at $p < .01$; significant at *** $p < .001$