

# Association Between Sexual Violence And Unintended Pregnancy Among Married Women In Zambia

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## Research Article

**Keywords:** Unintended Pregnancy, Sexual Violence, Married women, Contraceptive use, Zambia

**Posted Date:** March 10th, 2022

**DOI:** <https://doi.org/10.21203/rs.3.rs-1419741/v1>

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# Abstract

**Background:** Intimate partner violence against women is acknowledged as a worldwide public health issue. One of the outcomes of sexual violence is unintended pregnancy. In Zambia, 15% of married women age 15 to 49 had experienced sexual violence from their husband or partner. Since 1992, the prevalence of unintended pregnancies among women age 15 to 49 has risen to 38%. The link between sexual violence and unintended pregnancy in Zambia was investigated in this study.

**Methods:** The women's dataset from the 2018 Zambia Demographic and Health Survey was used in this study. The study looked at a weighted sample size of 5,132 women age 15 to 49. Descriptive, chi-square, bivariate, and multivariate binary logistic regressions were used in the data analysis. Multivariate binary logistic regression was performed to establish the net effects of sexual violence and each explanatory variable on unintended pregnancy.

**Results:** The findings suggest that sexual violence does have a role in unintended pregnancies (AOR 1.74; 1.38 - 2.19). Contraception use is also a significant predictor of unintended pregnancy (AOR 1.48; 1.16 - 1.88), even when other characteristics are taken into account. Results have shown that if a woman had ever used contraception and had experienced sexual violence, she was more likely to have an unintended pregnancy.

**Conclusion:** Spousal sexual violence is highly associated with unintended pregnancies in Zambia. Addressing intimate partner sexual violence is among the ways to prevent unintended pregnancies. It is also important to sensitize on women reporting acts of sexual violence to relevant authorities as this will not only prevent reoccurrence of sexual violence but also reduce unintended pregnancies and associated long-term effects.

## Background

Intimate partner violence against women is a human rights violation as well as a global public health issue (1). Particularly, sexual violence perpetuated by intimate partners continues to occur throughout the world especially among women. Sexual violence is defined as “any sexual act, attempt to obtain a sexual act, or other acts directed against a person’s sexuality using coercion, by any person regardless of their relationship to the victim, in any setting” (2). It includes rape, attempted rape, unwanted sexual touching and other non-contact forms” (3).

Globally, 1 in 3 women have experienced physical and/or sexual violence by an intimate partner or sexual violence by any perpetrator in their lifetime (2). Lifetime Intimate Partner Violence (IPV) prevalence range from 20% in the Western Pacific, 22% in high-income countries and Europe, and 25% in the WHO Regions of the Americas to 33% in the WHO African Region, 31% in the WHO East Mediterranean Region, and 33% in the WHO South-East Asia Region (3).

Sexual violence has many consequences of which unintended pregnancy is one such. Unintended pregnancy is defined as “a pregnancy that is either unwanted, where a pregnancy occurred when no children or no more children were desired, or the pregnancy is mistimed, where the pregnancy occurred earlier than desired” (4). According to (5), there were 121 million unintended pregnancies worldwide annually, between 2015–2019 (uncertainty intervals (UIs) 1128–1315), corresponding to a global rate of 64 unintended pregnancies (UI 60–70) per 1,000 women in the age group 15–49. Unintended pregnancy rates among women ages 15–49 vary by area, ranging from 35 pregnancies (UI 33–39) in Europe and Northern America to 91 pregnancies (UI 86–96) in Sub-Saharan Africa (5). Unwanted pregnancies and mistimed or unwanted births affect women’s health negatively; this negative effect extends to both the well-being of children and family alike.

Mistimed or unplanned pregnancies and births have a variety of implications, ranging from socioeconomic to physiological. Expectant mothers may undertake risky health behaviour such as unsafe abortion or delayed initiation of antenatal care (6). Maternal depression is not uncommon too (7); in some situations, young mothers drop out of school thereby increasing the burden of care on families. Women who are unable to plan their pregnancies are more likely to have unsafe or repeat abortions, while those who are unable to time or space their pregnancies are more likely to have maternal problems such as obstetric fistula, uterine rupture, and pregnancy-related death (8). Preterm birth, low birth weight, and small for gestational age are all linked to pregnancies spaced less than 18 months apart. Children, especially in resource-limited contexts, may experience more rivalry with their siblings for parental attention, food, education, and medical care if space between births is reduced (8).

Sexual violence against women and girls not only violates their rights, but limits their ability to participate in society as well and essentially reduces their health and well-being (9). In addition, sexual spousal violence affects a woman's physical, mental, sexual, and reproductive health, as well as her ability to make decisions (10). IPV fosters an environment that impacts a woman's autonomy, participation in decision-making related to her own health care, availability and use of contraceptives, and bargaining for safe sex, leading to unprotected sex and unexpected pregnancy (11–13).

Intimate Partner Violence (IPV) in pregnancy increases the likelihood of miscarriages, stillbirths, pre-term deliveries and low birth weight babies. A WHO study (14) found that women who have experienced IPV are 16% more likely to miscarry and 41% of them are more likely to give birth prematurely. Depression, post-traumatic stress and anxiety disorders, sleep problems, eating disorders, and suicide attempts are all possible outcomes of this type of violence (14). Women and girls as a result may also suffer isolation, inability to work, loss of wages, lack of participation in regular activities and limited ability to care for themselves and their children. The 2013 WHO study further shows that women who had been exposed to IPV were nearly twice as likely to suffer from depression and drinking problems compared with those who have not (14).

Unintended pregnancies have also been linked to sexual violence (15,16). IPV history (9,17)) and experience of spousal violence (physical or sexual violence) have both been found to be associated with

unwanted pregnancies (11,18). A study by (11) in Moldova, Azerbaijan and Ukraine, found that women who had ever experienced physical or sexual violence had a higher risk of unintended pregnancies. Similarly, (18) found that women in Bangladesh who had ever experienced domestic violence from their husbands/partners were more likely to report unwanted pregnancies (AOR: 1.46–1.54) than women who did not.

In similar setting, (19) found that women aged 15-49 in Damot Gale Woreda district of Southern Ethiopia who married later in life, had fewer children, were exposed to radio, discussed family planning with their husbands, had control over their health care, and were visited by a family planning worker, were less likely to have an unintended pregnancy. Women's inability to prevent unwanted pregnancy, on the other hand, was primarily attributable to a desire to have more children, a lack of contraceptive knowledge, spouse disapproval, difficulties in obtaining contraceptives, and contraceptive technique failure (19).

(20) used data from Ethiopia's 2011 DHS to investigate socioeconomic and demographic factors of unwanted childbearing among women age group 15-49. Women who were young, unmarried, of rich wealth status, high parity, ethnic majority, had less than a secondary education, and had a large household size were more likely to report unwanted births comparatively (Ibid).

A further analysis of the 2010 Malawi DHS, (21) found that a woman's age, fertility preference and the number of children ever born influenced mistimed pregnancies. On the other hand, a woman's age, wealth status, fertility preference, and residence all increased the likelihood of an unwanted pregnancy.

Spousal sexual violence and unintended pregnancies are also prevalent in the country of this study, Zambia. In 2018, 15% of currently married women age 15-49 reported ever-experiencing sexual violence by husbands or partners (22). The 2018 Zambia Demographic and Health Survey (ZDHS) also shows an increase in unplanned pregnancies from 33% in 1992 to 38% in 2018. This scenario supports already provided evidence where there exists (9,11,13,18,23) linkages between sexual violence and unintended pregnancies.

The literature reviewed hereby shows that there is a paucity of evidence on studies focusing on understanding the association between spousal sexual violence and unintended pregnancies in Zambia. Some studies that may have been conducted on this subject were based on teenage and adolescent fertility, contraceptive use, HIV and unintended pregnancies (24–26). However, there is a dearth of evidence that IPV affects women's fertility and evidence further shows that very few studies have explored the relationship between IPV and women's ability to control their fertility especially in developing countries like Zambia (17). Thus, this study was designed to explore the association between sexual violence and unintended pregnancies in Zambia using data from a nationally representative sample based on the 2018 DHS.

The developed conceptual framework in Figure 1 attempts to demonstrate the association between sexual violence and unintended pregnancy in Zambia. The main predictor variable in this study was sexual violence, influenced as well by socio-economic and demographic factors such as age, education

level, wealth status among many others. Women who have ever experienced sexual violence are more likely to report unintended pregnancies. Furthermore, demographic and socio-economic characteristics influence women's likelihood of experiencing sexual violence, ever use of contraception and reproductive health decision-making capacity and these may also contribute directly or indirectly to unintended pregnancies.

## **Methods**

### **Data Source**

This is an exploratory cross-sectional study based on the reanalysis of the 2018 ZDHS. The 2018 ZDHS was a nationally representative survey with a sample designed to produce estimates on a range of basic demographic and health indicators at the national and provincial levels, as well as by residence (rural and urban areas). The current study analysed data gathered from the women's record questionnaire, where such aspects as women's background characteristics; family planning; Antenatal, delivery, and postnatal care; Maternal and child health nutrition; marriage and sexual activity; reproduction, fertility preferences; domestic violence; women's work and husband's background characteristics. Other data gathered are on knowledge, awareness, and behaviour regarding HIV/AIDS and other sexually transmitted infections (STIs) among others are or were collected.

### **Study Design and Sampling Procedure**

The 2018 ZDHS used a stratified two-stage sample design. Sample clusters consisting of Enumeration Area (EAs) were selected with a probability proportional to their size within each sampling stratum and 545 clusters (198 in urban areas and 347 in rural areas) were selected at the first stage. The second stage involved systematic sampling of households in all of the selected clusters. An average of 133 households per cluster were found during household listing and from which 25 households were selected through an equal probability systematic selection process, to obtain a total sample size of 13,625 households. All women age 15-49 and men age 15-59 who were either permanent residents of the selected households or visitors who stayed in the households the night before the survey were eligible for interviews.

### **Target population and sample size**

The population for this study consisted women in the age group 15-49 selected and interviewed on the domestic violence module and gave birth in the last 5 years before the survey. Implementation of domestic violence module followed the World Health Organization's guidelines on the ethical collection of information on domestic violence, where only one eligible woman per household was randomly selected for interviewing after obtaining informed consent. Subsequently, 9,503 women age 15-49 were successfully interviewed on the domestic violence module. However, the final sample size for this study meeting the inclusion criteria of being married, having responded to the questions on domestic violence and had a birth in the five years prior to the survey was 4,465.

## **Study Variables**

### **Outcome Variable(s)**

The main outcome variable is unintended pregnancy. Women reporting to have given birth in the 5 years prior to the survey and indicated that their most recent pregnancy was wanted or not. The outcome variable – unwanted pregnancy (for the most recent pregnancy in the five years prior to the survey) – was recoded to generate a variable called “Unintended Pregnancy” with two categories: where “0” or “No” was for all women who said the most recent pregnancy was wanted, and “1” or “Yes” was coded for women that wanted to be pregnant later or did not want at all.

### **Independent variables**

#### **Main independent variable**

The main predictor variable was sexual violence. It was measured by asking ever-married women a series of questions including the following: Did your (last) (husband/partner) ever do any of the following things to you: 1) physically force you to have sexual intercourse with him when you did not want to? 2) Physically force you to perform any other sexual acts you did not want to? 3) Force you with threats or in any other way to perform sexual acts you did not want to? (22). Sexual violence was coded “0” or “No” (no experience of sexual violence by husband/ partner if the response was “No” to all of these questions), and “1” or “Yes” (experienced sexual violence by husband/ partner if Yes to one or more of these questions above).

#### **Other independent variables**

Other predictor variables included socio-economic and demographic characteristics of women such as age at last birthday (15-19, 20-24, 25-29, 30-34, 35-39, 40-44 and 45-49), number of living children (0, 1-2, 3-4, 5+), education level (no education, primary, secondary and higher), wealth status (poor, middle, rich), employment status (not working and working), residence (rural and urban), and whether a woman has ever used any contraceptive method (no if not using any method and yes if ever used any method).

Reproductive health decision-making capacity was derived from two variables namely: 1) decision-making on sexual intercourse, that is women were asked whether they could say no to their husband if they do not want to have sexual intercourse: 2) decision-making on condom use, that is women were asked whether they could ask their husband to use a condom during sexual intercourse (27). Each one of these questions had three response categories namely, yes, no and do not know. Therefore, the variable “reproductive health decision-making capacity” was generated as a two outcome variable, with women who said “no and don't know” to both questions recoded as “No” implying not capable of making reproductive health decision whilst those who said “Yes” to any or both questions were recoded as “Yes” and labelled as capable of making reproductive health decisions.

## **Statistical Analysis**

A calculated special weight for domestic violence for the 2018 ZDHS which accounts for the selection of one woman per household and for module non-response was applied to ensure that the sample was nationally representative using the svyset command to account for complex survey design. These weights were calculated by multiplying the household sampling weight from which the woman was sampled by the inverse of the woman's individual response rate by stratum, and then normalizing the results to obtain the final standard weights used in this analysis by multiplying the sampling weight by the estimated sampling fraction obtained from the survey for the household weight and the individual woman's weight.

Data analysis was conducted using Stata version 14 where univariate, bivariate and multivariate binary logistic regression were performed. Univariate analysis produced distribution of women by different demographic and socio-economic factors. Chi-square test was performed to examine if there was a relationship (and if statistically significant) between the outcome variable – unintended pregnancy and the main predictor variable – sexual violence and other independent variables, while the Binary logistic regression analysis was used because the outcome variable is dichotomous.

Multivariate binary logistic regression was performed to determine adjusted effects of sexual violence on unintended pregnancy adjusted for demographic and socio-economic factors. For our study, we performed four models (i) Unadjusted Odds Ratio (UOR) for women's experience of sexual violence on unintended pregnancy; (ii) Adjusted Odds Ratio (AORs) of women's ever use of contraceptive method and reproductive health decision-making capacity on unintended pregnancy; (iii) AORs for women's experience of sexual violence, ever use of contraceptive method and reproductive health decision-making capacity on unintended pregnancy; and (iv) AORs for women's experience of sexual violence, ever use of contraceptive method, reproductive health decision-making capacity and demographic and socio-economic characteristics on unintended pregnancy. Both the UORs and AORs were considered significant at  $p < 0.001$ ,  $p < 0.01$  and  $p < 0.05$ .

## Results

### Background characteristics of women

Table 1 shows the frequency and percentage distribution of women by background characteristics. The mean age of the women in the study was 29.3 years. Results show that majority of women were in the age group 25–29 (25%), reside in rural areas (63%), had attained primary level of education (51%) and lived in households classified as poor (45%). Regarding employment status, half (50%) of the women were reported to be employed. Over half of them (54%) were married for the first time when they were age 18 years or older.

Majority (37%) reported to have 1 to 2 children with more than half (53%) having an ideal number of five and/or more children. Results further show that 50% of the women had reproductive health decision-making capacity and the other 50% did not. In addition, 8 in 10 women reported ever used any method of

contraceptive and did not know the fertile period. Majority (85%) of the women did not experience sexual violence. Figure 2 shows that 36% of the pregnancies were unintended.

Table 1  
Distribution Of Women By Socio-Economic And  
Demographic Characteristics

Characteristics	ZDHS 2018	
	%	n
<i>Mean age (in years)</i>		29.3
<i>Age group</i>		
15–19	5.3	238
20–24	23.1	1,031
25–29	24.6	1,098
30–34	20.5	915
35–39	16.1	720
40–44	7.7	345
45–49	2.7	118
<i>Type of residence</i>		
Urban	36.6	1,633
Rural	63.4	2,833
<i>Educational level</i>		
No education	10.4	466
Primary	51.3	2,292
Secondary	33.8	1,510
Higher	4.4	197
<i>Wealth status</i>		
Poor	45.4	2,027
Middle	19.1	853
Rich	35.5	1,586
<i>Employment status</i>		
Unemployed	49.7	2,221
Employed	50.3	2,245
<i>Age at first marriage</i>		

Characteristics	ZDHS 2018	
	%	n
< 18	46.2	2,064
18+	53.8	2,401
<i>Ever used any contraceptive method</i>		
No	18.9	842
Yes	81.1	3,623
<i>Children ever born</i>		
1-2	36.6	1,635
3-4	29.9	1,337
5+	33.4	1,493
<i>Ideal number of children*</i>		
0	0.9	38
1-2	5.5	241
3-4	40.3	1,765
5+	53.3	2,333
<i>Reproductive health decision-making capacity</i>		
No	49.7	2,217
Yes	50.3	2,248
<i>Knows fertile period</i>		
No	80.2	3,582
Yes	19.8	884
<i>Ever experienced any sexual violence</i>		
No	85.1	3,802
Yes	14.9	663
Total	100	4,465

\* n = 4,377

### Characteristics of women experiencing unintended pregnancy

Table 2 shows chi-square test results for unintended pregnancies by socio-economic and demographic characteristics of women. Unintended pregnancies were significantly higher among women age 45 to 49 years (49%), those that had no education (37%) and those with primary level of education (37%). More women from a rich wealth quintile index (37%) reported to have experienced unintended pregnancies compared to other wealth quintile categories. Similarly, unintended pregnancies were higher among women who were unemployed (38%), those that ever used any contraceptive method (37%), those that had five or more children (42%), those that had no reproductive health decision-making capacity (38%) and those that experienced sexual violence (47%).

Table 2  
socio-economic and demographic factors of women experiencing unintended pregnancies

Characteristics	Unintended pregnancies		
	%	CI	P-value
<i>Age group</i>			0.000
15–19	43.1	[36.1,50.4]	
20–24	37.4	[34.0,41.0]	
25–29	31.5	[27.9,35.3]	
30–34	29.6	[26.4,33.1]	
35–39	39.4	[34.4,44.7]	
40–44	40.2	[33.4,47.3]	
45–49	49.3	[38.0,60.6]	
<i>Type of residence</i>			0.507
Urban	37.4	[33.5,41.5]	
Rural	34.4	[32.0,36.9]	
<i>Educational level</i>			0.002
No education	36.6	[31.7,41.7]	
Primary	36.5	[34.0,39.0]	
Secondary	36.2	[32.0,40.6]	
Higher	16.6	[10.7,25.0]	
<i>Wealth status</i>			0.027
Poor	34.7	[32.2,37.3]	
Middle	34.4	[30.4,38.7]	
Rich	37.1	[32.7,41.8]	
<i>Employment status</i>			0.005
No	38.1	[35.5,40.8]	
Yes	32.9	[30.0,35.9]	
<i>Age at first marriage</i>			0.748
< 18	35.8	[33.2,38.6]	

Characteristics	Unintended pregnancies		
	%	CI	P-value
18+	35.2	[32.4,38.2]	
<i>Ever used any contraceptive method</i>			0.000
No	28.6	[25.0,32.5]	
Yes	37.1	[34.7,39.6]	
<i>Children ever born</i>			0.000
1–2	34.3	[31.0,37.7]	
3–4	29.5	[26.5,32.6]	
5+	42.3	[39.2,45.4]	
<i>Ideal number of children</i>			0.334
0	39.6	[23.3,58.5]	
1–2	41.6	[33.8,49.8]	
3–4	36.2	[32.5,40.0]	
5+	34.4	[32.0,36.9]	
<i>Reproductive health decision-making capacity</i>			0.000
No	36.7	[33.5,39.9]	
Yes	34.4	[31.9,36.9]	
<i>Knows fertile period</i>			0.110
No	36.3	[33.9,38.7]	
Yes	32.5	[28.4,36.7]	
<i>Ever experienced any sexual violence</i>			0.000
No	33.5	[31.2,35.8]	
Yes	47.2	[42.4,52.0]	
Total	35.5	[33.4,37.7]	n = 4,465

## Factors associated with unintended pregnancy

Results in Model 1, (which is the unadjusted odds ratios (UORs)) show that, women who had experienced sexual violence were 1.77 times [CI 1.42–2.22] more likely to have unintended pregnancies (Table 3).

Model II shows the adjusted odds ratios (AORs) of unintended pregnancy controlled for use of

contraception and reproductive health decision-making capacity of women. Results show that, women who had ever used contraceptive method were 1.50 times [CI 1.20–1.87] more likely to have an unintended pregnancy adjusted for reproductive health decision-making capacity. Reproductive health decision-making capacity of women is not associated with unintended pregnancies.

In Table 3, Model III shows the AORs of unintended pregnancies controlled for sexual violence, ever use of contraception and reproductive health decision-making capacity of women. When the Model III results are compared to the Model II results, there is a minor decrease in the risk of unintended pregnancy among women who had experienced sexual violence. However, women who had experienced sexual violence were (still) more likely to have an unintended pregnancy than those who had not [AOR: 1.73, CI 1.38–2.17]. On the other hand, there was no significant statistical association between unintended pregnancies and reproductive health decision-making capacity of women.

Table 3

Logistic regression results on sexual violence, contraception and reproductive health decision-making capacity of women and unintended pregnancies

Characteristics	Model I		Model II		Model III	
	OR	CI	AOR	CI	AOR	CI
<b>Ever experienced any sexual violence</b>						
No (RC)	1					
Yes	1.77***	1.42–2.22			1.73***	1.38–2.17
<b>Ever used any contraceptive method</b>						
No (RC)			1		1	
Yes			1.50***	1.20–1.87	1.47***	1.17–1.84
<b>Reproductive health decision-making capacity</b>						
No (RC)			1		1	
Yes			0.88	0.74–1.04	0.90	0.76–1.08
Constant	0.50***	0.45–0.56	0.42***	0.35–0.51	0.39***	0.32–0.47
*** p < 0.001, ** p < 0.01, * p < 0.05						

Model IV in Table 4 shows the AORs of unintended pregnancies controlled for all covariates. The magnitude of the effect between sexual violence and unintended pregnancies decreased slightly. Despite the decrease in association, results show that women who had ever experienced sexual violence were

1.74 times [CI 1.38 - 2.19] more likely to have had an unintended pregnancy. Results by age group of women show that all women 20-49 years were less likely to have had an unintended pregnancy when compared with younger women age 15-19. Women that had attained higher education [AOR 0.38; CI 0.21 - 0.69] and those who were employed [AOR 0.81 CI 0.69 - 0.94] were less likely to have experienced an unintended pregnancy.

On the other hand, women who first married at 18 years and above [AOR 1.25; CI 1.06 - 1.48], ever used any contraceptive method [AOR 1.48; CI 1.16 - 1.88] and had five or more children [AOR 2.83; CI 1.96 - 4.07] were more likely to have experienced an unintended pregnancy. However, place of residence, ideal number of children, reproductive health decision making capacity and correct knowledge of fertility period were not significantly associated with unintended pregnancies.

Table 4  
 Logistic regression results on sexual violence, selected socio-economic and demographic factors and unintended pregnancies

Characteristics	Model IV	
	AOR	CI
<i>Ever experienced any sexual violence</i>		
No (RC)		
Yes	1.74***	1.38–2.19
<i>Age group</i>		
15–19 (RC)		
20–24	0.64*	0.44–0.94
25–29	0.39***	0.26–0.57
30–34	0.28***	0.19–0.43
35–39	0.35***	0.22–0.55
40–44	0.35***	0.21–0.57
45–49	0.50*	0.25–0.98
<i>Type of residence</i>		
Urban (RC)		
Rural	0.89	0.68–1.16
<i>Educational level</i>		
No education (RC)		
Primary	0.95	0.77–1.17
Secondary	0.94	0.70–1.26
Higher	0.38**	0.21–0.69
<i>Wealth status</i>		
Poor (RC)		
Middle	0.98	0.79–1.22
Rich	1.28	0.95–1.73
<i>Employment status</i>		
*** $p < 0.001$ , ** $p < 0.01$ , * $p < 0.05$		

Characteristics	Model IV	
	AOR	CI
Unemployed (RC)		
Employed	0.81**	0.69–0.94
<i>Age at first marriage</i>		
< 18 (RC)		
18+	1.25**	1.06–1.48
<i>Ever used any contraceptive method</i>		
No (RC)		
Yes	1.48**	1.16–1.88
<i>Children ever born</i>		
1–2 (RC)		
3–4	1.28	1.00–1.63
5+	2.83***	1.96–4.07
<i>Ideal number of children</i>		
0 (RC)		
1–2	1.32	0.55–3.18
3–4	1.01	0.46–2.20
5+	0.79	0.36–1.71
<i>Reproductive health decision-making capacity</i>		
No (RC)		
Yes	0.90	0.76–1.08
<i>Knows of fertile period</i>		
No (RC)		
Yes	0.94	0.77–1.15
<i>Constant</i>	0.71	0.29–1.72
<i>n</i>	5,090	
*** $p < 0.001$ , ** $p < 0.01$ , * $p < 0.05$		

## Discussion

According to the current paper's findings, married women in Zambia had a high rate of unintended pregnancies (36%). This figure is much higher than what (27) found in a study of 22 Sub-Saharan African countries, where about 5% of married women had unintended pregnancies, and what (9) found in a study of the 2016 Nepal DHS, where 23% of married women had unintended pregnancies. The prevalence of unintended pregnancies in Zambia, on the other hand, is lower than that of (28) in South Africa, who found that 42% of the women in the study had an unintended pregnancy.

Using data from the 2018 Zambia DHS, we investigated the association between sexual violence and unintended pregnancy. Forty-seven percent of women who had ever experienced spousal sexual violence had unintended pregnancy. Results of both the UORs and AORs show a significant relationship between experience of any sexual violence and unintended pregnancies among married women in Zambia. Unintended pregnancy was 1.7 times more likely to happen in women who had experienced any form of sexual violence from a spouse than in women who had not experienced any. Our findings are similar to those of (27–29), who found that women who had experienced sexual violence had a 1.6, 1.7 and 2.3 times higher likelihood of unwanted pregnancies than women who had never experienced sexual violence. There are a number of possible explanations for why this situation happens. Refusing to satisfy a husband's sexual desires, for example, might lead to arguments and forced sex, resulting in unwanted pregnancies (29). Furthermore, IPV fosters an environment that influences a woman's participation in decision-making related to her own health care, availability and use of contraceptives, and bargaining for safe sex, such as condom use, leading to unprotected sex and unwanted pregnancy (11–13). Others claim that women are usually subjected to sexual exploitation and torture, which has long-term harmful consequences for their mental, physical, reproductive, and sexual health (10).

Our study found that unintended pregnancies were less common among married women age 20 to 49 than among those age 15 to 19. This is backed with the generally held view that young married women had a higher risk of experiencing an unwanted pregnancy due to a number of inadequacies, which include inability to negotiate safe sex. It may also be due to the fact that majority of young married women may have little to no awareness on sexuality and family formation practices, which are only learnt after they have been married (29,30). Moreover, for such young married women, husbands tend to take it as though sexual intercourse is their entitlement and as such, they have all the right to do whatever they want with regard to sexual life even to their own wives, leading to use of force and other forms of sexual violence thereby increasing the likelihood of unintended pregnancies. Furthermore, the current, social cultural norms and beliefs within society such as early marriages and traditional teachings have perpetuated this practice, thus the higher likelihood of unintended pregnancies among the young women age 15–19. Other studies, on the other hand, reveal that older women between the ages of 40 and 44, as well as those between the ages of 45 and 49, are more likely than younger women to have unintended pregnancies (27,30). This is because women in these age groups may have had the desired number of children, thus, any pregnancy experienced would be unwanted. Women above the age of 35 have a higher risk of maternal death, baby death, and induced abortions. Furthermore, in resource-poor nations like

Zambia, such women are more likely to have poor reproductive health practices and behaviour, including low contraceptive usage, low prenatal attendance, and non-facility births (31).

According to studies conducted by (18,30,32), women who have attained high school or tertiary education are less likely to experience sexual violence and, as a result, unintended pregnancy is also less likely. This finding is comparable to what our study established, where women with higher education had lower risk of having unintended pregnancies. Various reasons could be advanced for this observed phenomenon, to the effect that women with higher education have better understanding of their rights and thus are able to bargain their way out or speak with their spouse when the risk of sexual violence is eminent. Furthermore, unlike uneducated married women, educated married women may be able to access family planning services, use contraceptives correctly and consistently and thereby reduce odds of unintended pregnancy.

Our findings further show that women who married when they were 18 years old or older had a higher chance of having an unintended pregnancy than women who married when they were younger than 18 years old. This finding contradicts a 2015 study by (32), who showed that unplanned pregnancies decreased with increasing age at marriage among currently pregnant ever-married women in India; it is also at variance with a study by (19) who found that women who married later in life were less likely to have an unintended pregnancy. Holding all else constant, it is assumed that women who marry later in life are more likely to have attained some secondary or higher education and are likely income earners and may therefore have control of their reproductive lives and would protect themselves against unintended pregnancies.

Our results were somehow surprising in regards to those women who reported having used any kind of contraception; they had 1.48 times the chance of having an unintended pregnancy compared with women who had never used any form of contraception. This finding, although surprising to say the least is consistent with findings by (32). A number of factors, including incorrect and inconsistent contraceptive use, contraceptive failure, societal and cultural beliefs and norms about contraceptive methods among married women, and so on, could explain this finding.

The odds of unintended pregnancy was higher among women with high parity (5 and more children ever born). Similarly, (13) found that the odds of unintended pregnancy was significantly higher among women with more than two children ever born. The likelihood of this occurring in a country like Zambia is highly possible since 20% of currently married women have an unmet need for family planning. Furthermore, certain women may be looking forward to having a child of a specific sex, and once this desire is fulfilled, the need for children would be drastically reduced. Moreover, because some males prefer a specific sex of a child, usually "males," the odds of women having unwanted pregnancies may persist until their partner's wish is met.

Results in this study have shown that factors such as place of residence and wealth status were not significantly associated with unintended pregnancies. This finding contradicts (21)'s study in Malawi where it was found that fertility preference and the number of children ever born have an influence on

mistimed pregnancies and also that woman's age, wealth status, fertility preference, and residence all increased the likelihood of an unwanted pregnancy.

Our study found no significant association between unintended pregnancy and reproductive health decision-making capacity. In addition, prevalence of unintended pregnancy was 37% among women who had no reproductive health decision-making capacity and 34% among women who had reproductive health decision-making capacity. This finding is different from what (27) found where in their study, women who had the capacity to make reproductive health decision were less likely to have experienced unintended pregnancies compared to those who did not have the capacity.

## Conclusion

Our study has established that, in comparison to other nations, Zambia has a high prevalence of unintended pregnancies, particularly among women who have experienced sexual violence. Women in Zambia who have experienced sexual violence are about twice more likely than those who have not to have unintended pregnancies. Other predictors of unintended pregnancy were first marriage at age 18 or older, ever-used contraceptives, and with high parity (5+) were associated with unintended pregnancies. On the other hand, women who were age 20–49, had attained higher education and being in employment were protective of unintended pregnancy.

Measures aiming at eliminating gender disparity and early detection of sexual violence should be prioritized and integrated into the existing family planning services provided by the Ministry of Health's Maternal and Child Health Department, rather than being offered as a vertical service. If Zambia is to attain Sustainable Development Goal (SDG) 3 - Good health and well-being - and SDG 5 - Gender Equality, health service provision must take into account requirements of various categories of women, such as adolescents and the less educated. Furthermore, publicizing the importance of women reporting acts of sexual violence to relevant authorities should be prioritized to reduce not only unwanted births but also prevent future reoccurrence of sexual violence among married women.

## List Of Abbreviations

AORs	Adjusted Odds Ratios
CI	Confidence Interval
DHS	Demographic and Health Survey
EA	Enumeration Area
IPV	Intimate Partner Violence
IRBs	Institutional Review Boards

OR	Odds Ratio
RC	Reference Category
STIs	Sexually Transmitted Infections
SDG	Sustainable Development Goal
TDRRC	Tropical Diseases Research Centre
UIs	Uncertainty Intervals
WHO	World Health Organisation
ZDHS	Zambia Demographic and Health Survey

## **Declarations**

### **Ethics approval and consent to participate**

Measure DHS provided approval of the use of the 2018 ZDHS female dataset for further analysis. National and international Institutional Review Boards (IRBs) at the Tropical Diseases Research Centre (TDRRC) in Zambia and at ICF approved the protocols for the ZDHS 2018 survey methodology, biomarker measurements, and all instruments prior to data collection (22). During data collection, consent to participate in the survey was obtained from women and separate consent was further sought from women selected to respond to the domestic violence module. Therefore, the authors of this paper did not seek ethical clearance or consent from women. In addition, there have been no attempts to either identify survey participants in the dataset or use of the dataset for any other purposes other than that approved by DHS Program.

### **Consent for publication**

Not applicable

### **Availability of data and materials**

The supporting the conclusions of this article is available at <https://dhsprogram.com/Data/>

### **Competing interests**

There are no competing interests declared by the authors.

### **Source of Funding**

None

## Authors' contributions

M.E.K. designed the study, accessed the data, conducted data analysis, and oversaw the whole writing and finalization of the manuscript. B.B.B. wrote the draft discussion of the findings and reviewed the final manuscript. C.C.M. gave technical input into the manuscript in order to improve the content and layout, as well as reviewed the draft and final manuscript. E.T.M. co-wrote the proposal manuscript's first draft and conducted a literature review. M.S. conducted the literature review and co-wrote the findings narration. K.C. conducted the literature review and co-wrote the findings narration. G.S. co-reviewed the first draft proposal and extended abstract for the manuscript. All authors read and approved the final manuscript.

## Acknowledgments

The DHS Program approved the use of the 2018 Zambia DHS women's dataset for analysis, which we gratefully acknowledge. The authors posthumously thank Caroline Banda for having co-designed the study, conducted preliminary data analysis and co-wrote the extended abstract for this manuscript.

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# Figures

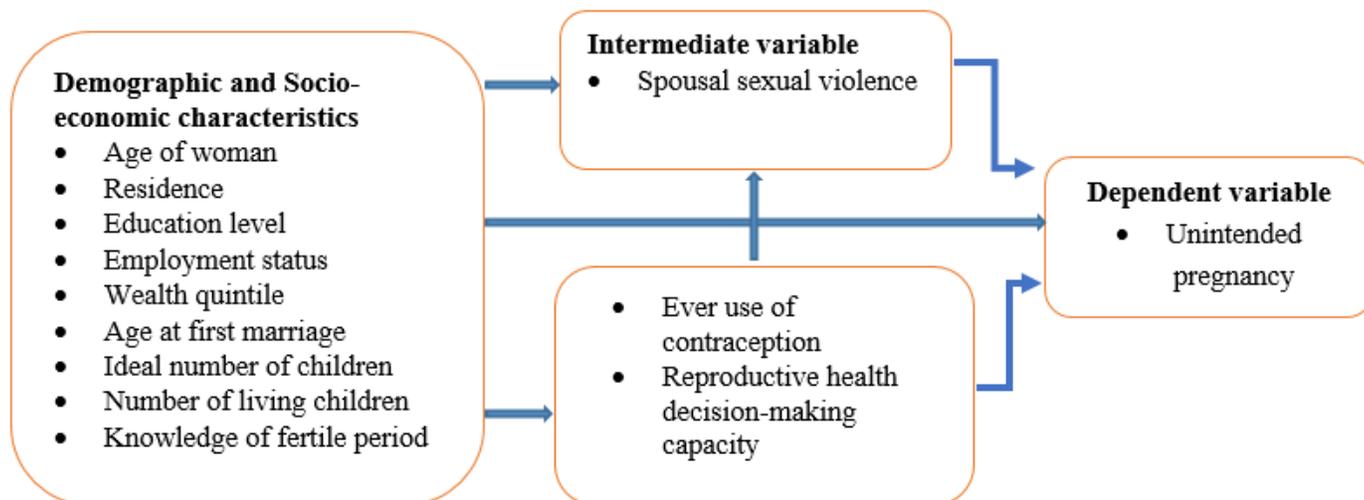


Figure 1

*Study conceptual framework*

*Source: Developed by Authors based on review of literature*

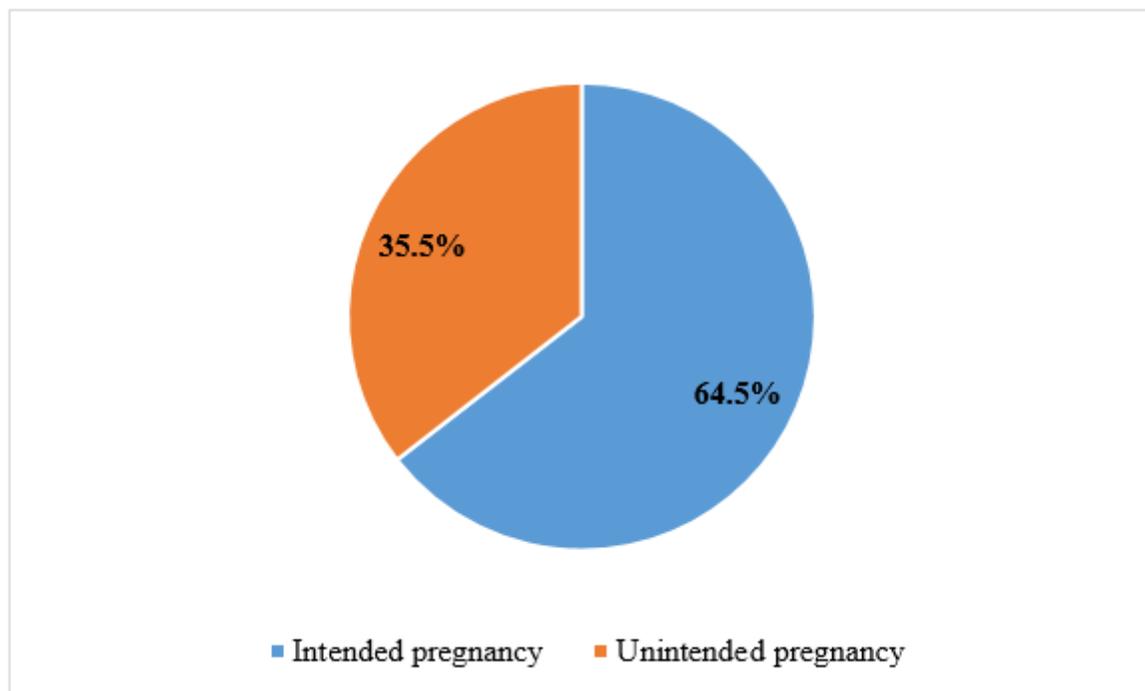


Figure 2

Percentage of women with unintended pregnancies