Investigating the Associations Between Intimate Partner Violence and Nutritional Status of Women in Zimbabwe

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Abstract

Background

Intimate partner violence (IPV) against women and poor nutritional status are growing health problems in low and middle-income countries (LMICs). Moreover, violence against women has been shown to be associated with poor nutrition. This study investigated the relationship between IPV and nutritional status (i.e., underweight, overweight, and obesity) among women of reproductive age (15–49 years) in Zimbabwe.

Methods

Pooled data from the 2005/2006, 2010/2011, and 2015 Zimbabwe Demographic Health Surveys (ZDHS) on 13,008 married/cohabiting women were analysed. Multinomial logistic regression models were used to examine the associations between the various forms of IPV and the nutritional status of women. We further estimated the prevalence of BMI $\geq$ 25.0 kg/m^2 (overweight and obesity) by intimate partner violence type.

Results

The mean BMI of women was 24.3 kg/m^2, more than one-fifth (24%) were overweight and about 12% were obese. Forty-three percent (43%) of women reported to have ever experienced at least one form of intimate partner violence. More than one-third (35%) of women who reported to have ever experienced at least one form of intimate partner violence had a BMI $\geq$ 25.0 kg/m^2 ($p < 0.01$). Relative to normal weight, women who had ever experienced at least one form of IPV (i.e., physical, emotional, or sexual) were more likely to be obese (aOR = 2.59; 95% CI = 1.05–6.39). Women's exposure to any form of intimate partner violence was not significantly associated with the likelihood of being underweight or overweight relative to normal weight.

Conclusions

The study findings showed that women of reproductive age in Zimbabwe are at high risk of both IPV and excess weight. Moreover, we found a positive relationship between IPV and obesity. Public health interventions that target the well-being, empowerment, and development of women are needed to address the complex issue of IPV and adverse health outcomes, including obesity.

Introduction

Intimate partner violence (IPV) is a form of gender-based violence [1], mostly perpetrated against women [2, 3]. This behaviour is assaultive and coercive [4, 5], and it comes in the form of emotional, sexual, or physical abuse [6–9]. The various forms of abuse may co-exist [10]; for instance, physical abuse or violence is mostly accompanied by sexual violence, and the latter may also come along with emotional violence [10, 11]. IPV is increasingly recognized as a relevant social and health problem by relevant institutions and organizations worldwide [12–14], due to its adverse impacts on victims [10, 15], and society as a whole [7, 16–19].

Violence against women as a health problem [16, 17] has been shown to be one of the leading causes of both medical diagnosed and non-medical explainable physical, mental, and gynecological health problems [7, 20–23]. Also, it remains a symptom of gendered power relations [24, 25], which may be a predictor of women's health [26, 27], including stressful conditions [24, 28], and nutritional status such as underweight, overweight and obesity [18].

The issue of obesity is becoming a worldwide problem [29], increasingly also in developing countries [30]. In Sub Saharan Africa, the prevalence of overweight and obesity has been rising at an alarming rate [31], and women are the most affected [31]. Globally, overweight and obesity among female adults have increased from 29.8–38.0% between 1980 and 2013 respectively [32], with a recent study conducted in Zimbabwe [33] confirming these findings for the time period 2005 to 2015. Differences in experiencing obesity and overweight among socioeconomic subgroups [34] may be linked to IPV in complex ways. For example, prior evidence suggests that abused women may end up suffering from depression [35], and may hence seek consolation in overeating [36]. In rich food environments, they tend to consume energy-dense foods [37], which has been shown to be a risk factor for obesity [18, 37]. Furthermore, there is evidence that physical and sexual violence against women may predict excessive weight gain and poor nutrition [38, 39], where some abused women tend to suffer from high stress-induced metabolisms, depression, loss of appetite with limited caloric intake [40, 41]. The stress suffered by abused women has been shown to increase oxidative stress and metabolic levels [41, 42], which are also risk factors for anemia and underweight [26, 35]. IPV thus contributes to the risk of poor nutrition outcomes, especially where abusive male partners withhold food as a form of punishment to their female partners [43].

From the above discussions, it is clear from the literature that there is an relationship between IPV and women's health [44, 45]. While some studies have examined the relationship between dietary knowledge, the attitude of behaviours, socio-demographic factors and IPV [18, 27, 46, 47], no study has investigated the association between IPV and the nutritional status of woman in Zimbabwe. This study, therefore, sought to explore the relationship between IPV and nutritional status (i.e., underweight, overweight, and obesity) among women of reproductive age Zimbabwe.

Materials And Methods

Data

The analysis was based on pooled data of married/cohabiting women from the 2005/2006, 2010/2011, and 2015 Zimbabwe Demographic Health Surveys. The surveys were conducted by the Zimbabwe National Statistical Agency in collaboration with other international organizations, and they were nationally representative surveys of men and women in their reproductive age. The surveys employed a two-stage stratified cluster sampling technique based on census enumeration areas (EAs) and household samples in both rural and urban areas. The first stage was the selection of EAs with probability proportional to the size and the second stage involved household sampling. The analysis was limited to non-pregnant women of reproductive age with valid weight and height measurements. Pregnant women were excluded to avoid a misleading picture of the issue of overweight and obesity during pregnancy [33]. The samples after the exclusion were (survey year: 2005/2006; n = 4,031), (survey year: 2010/2011; n = 4,211) and (survey year: 2015; n = 4,766), with a pooled total (N = 13,008) for the final analysis.

Measurement of the outcome variable

The outcome variable for this study was the nutritional status of women (that is, underweight, normal weight, overweight, and obesity). The body mass index (BMI; weight (kg)/height (m) squared) was used to assess the nutritional status of women [48], and it is commonly used to classify underweight, overweight and obesity in adults [49, 50]. Respondents were classified according to the BMI criteria of the World Health Organisation (WHO): a) underweight, BMI < 18.5 kg/m^2; b) normal weight, BMI of 18.5–24.9 kg/m^2; c) overweight, BMI of 25.0–29.9 kg/m^2 and d) obesity, BMI ≥ 30.0 kg/m^2 [51]. In the surveys, participants' standing heights were measured using a measuring board and their weights were taken using the United Nations Children's Fund (UNICEF) electronic scale with a digital display.

Independent variables

The outcome variable in this study was IPV. The measurement of IPV in the surveys was based on the Revised Conflict Tactics (CTs) [52] and was administered following standard guidelines for research on domestic violence set by the World Health Organisation [53]. The questions posed to women included "did your husband/partner ever: slap, push, shake, punch, beat, kick or try to strangle you, throw something at you, threaten you using a harmful object?" These questions were used to derive physical violence. Sexual violence was assessed by the questions "did your husband/partner ever: physically force you to have sexual intercourse even when you did not want? Or force you with threats to perform any sexual acts you did not want?" Psychological violence was assessed using questions such as "did your husband/partner humiliate you in front of others, threaten to hurt you or those close to you with harm?". Responses were categorized as physical, emotional, sexual, physical or emotional, physical or sexual, emotional or sexual, and physical, sexual or emotional. Answers in the affirmative were coded as "1", while women who never experienced any of the aforementioned forms of IPV was coded as "0".

Socioeconomic controls

In the adjusted regression models, we controlled for the following socio-demographic and economic variables: age (15–29, 20–24, 25–29, 30–34, 35–39, 40+); marital status (married, cohabiting); place of

residency (rural, urban), educational level (no education, primary, secondary and higher); parity (< 2, 2–3, 4–5, 6+); employment status (not currently employed, currently employed); and wealth index (poorest, poorer, middle, richer). All the variables were obtained from either the individual women's or the household questionnaires.

Statistical Analysis

First, basic descriptive statistics were performed to obtain the mean, frequency and percentages of the dependent, independent and some control variables. Second, percentages (%) were used to describe the prevalence of BMI ≥ 25.0 kg/m^2 (overweight and obesity) and the various forms of IPV. Differences in prevalence were examined using chi-square test. Third, we estimated the prevalence of IPV among women who experienced at least one type of abuse (i.e. physical, sexual or emotional) by nutritional status (underweight, normal weight, overweight and obese). In the second part of the analysis, multinomial logistic regression models were used to examine the associations between the various forms of IPV and the nutritional status of women. The prevalence and adjusted odd ratios (aOR) with 95% confidence intervals (95% CI) was calculated using Stata Version 14 (Stata Corp, College Station, Texas, USA). The dataset was weighted to account for differences in the sampling design.

Results

Distribution of selected characteristics

The distribution of respondents' characteristics is shown in Table 1. Overall, the mean age of women was approximately 30 years. Most women (64%) reported having secondary or higher education. On average, women had three live births, and about 67% lived in rural areas. Regarding economic status, more than half (61%) were not in paid employment, and 41% reported middle economic class.

Table 1
Percentage distribution of the characteristics of women (15–49 years) in Zimbabwe, pooled data, 2005–2015 (*n* = 13,008)

Variables	%
Anthropometry	
BMI (Kg/m2) (Mean = 24.31; SD = 4.64)	
Underweight, or BMI < 18.5	5.11
Normal weight, or BMI 18.5 ≤ BMI < 25	59.45
Overweight, or 25 ≤ BMI < 30	23.59
Obese, or BMI ≥ 30	11.85
Intimate Partner Violence, by type	
Physical	
Ever	28.18
Never	71.82
Emotional	
Ever	28.06
Never	71.94
Sexual	
Ever	12.60
Never	87.40
Physical or Emotional	
Ever	40.12
Never	59.88
Physical or Sexual	
Ever	33.29
Never	66.71
Emotional or Sexual	
Ever	33.03
Never	66.97
Physical or Emotional or Sexual	

Variables	%
Ever	43.17
Never	56.83
Sociodemographic controls	
Age (Mean = 30.36; SD = 7.96)	
15–19	6.33
20–24	20.73
25–29	23.35
30–34	20.29
35–39	13.65
40+	15.64
Marital Status	
Married	95.65
Cohabiting	4.35
Parity	
<2	25.68
2–3	45.20
4–5	20.53
6+	8.59
Place of residence	
Urban	33.36
Rural	66.64
Educational Level	
No education	2.79
Primary	33.29
Secondary and higher	63.92
Employment Status	
Not currently employed	61.12
Currently employed	38.88

Variables	%
Wealth (Index)	
Poorest	20.76
Poorer	19.08
Middle	41.47
Richer	18.69

The mean BMI of women was 24.3 kg/m^2 (Table 1). A high proportion of women had normal weight (59%), more than one-fifth were overweight (24%) and about 12% were obese. The results further showed that more than one-third (43%) of women reported to have ever experienced at least one form of intimate partner violence, and large proportions ever experienced physical (28%), emotional (28%), and sexual (13%) violence. More than one-third reported any physical or emotional violence (40%) and any emotional or sexual violence (33%).

Table 2

Prevalence of BMI ≥ 25.0 kg/m^2 (overweight and obesity) among women of reproductive age (15–49 years) by intimate partner violence type, Zimbabwe, pooled data, 2005–2015

	BMI ≥ 25 Kg/m2 (%)	*P* value*
Intimate Partner Violence, by type		
Physical		< 0.001
Ever	31.86	
Never	36.84	
Emotional		0.244
Ever	34.66	
Never	35.75	
Sexual		< 0.05
Ever	33.07	
Never	35.78	
Physical or Emotional		< 0.001
Ever	33.89	
Never	36.62	
Physical or Sexual		< 0.001
Ever	32.49	
Never	36.91	
Emotional or Sexual		< 0.05
Ever	34.08	
Never	36.11	
Physical or Emotional or Sexual		< 0.01
Ever	35.44	
Never	36.62	
* *p* values are based on the χ2 test		

In Table 2, the results of the prevalence of BMI ≥ 25.0 kg/m^2 (overweight and obesity) by intimate partner violence type are shown. In general, more than one-third (35%) of women who reported to have ever experienced at least one form of intimate partner violence (i.e., physical emotional or sexual) had a BMI

≥ 25.0 kg/m^2 ($p < 0.01$). Similarly, more than one-third of women who ever experienced sexual (33%), any physical or emotional (34%), and any physical or sexual (33%) violence reported being overweight or obese. The prevalence of any form of intimate partner violence (i.e., physical, sexual, or emotional) was generally high (60%) among women who had normal weight (Fig. 1).

Multinomial Logistic regression

The adjusted odd ratios (aOR) and 95% confidence intervals for the associations between intimate partner violence and the nutritional status of women are shown in Table 3. The multinomial regression model estimated the relative risk ratios of the relationships between intimate partner violence and body mass index (BMI) comparing underweight, overweight, and obesity to normal weight. In the model, we adjusted for socioeconomic factors (categorical, as shown in Table 1) and other behavioural risk factors including smoking status (yes or no), alcohol consumption (yes or no) and media exposure (yes or no).

Table 3
Multinomial logistic regression of the association between intimate partner violence and nutritional status of women (15–49 years), Zimbabwe, pooled data, 2005–2015

	Underweight - aOR(95% CI)	Overweight - aOR (95% CI)	Obese -aOR (95% CI)
Intimate Partner Violence, by type			
Physical			
Never (ref)	1	1	1
Ever	1.31 (0.66–2.62)	0.93 (0.65–1.32)	0.97 (0.59–1.59)
Emotional			
Never (ref)	1	1	1
Ever	1.41 (0.61–2.14)	1.32 (0.91–1.91)	2.22 (1.16–4.13)
Sexual			
Never (ref)	1	1	1
Ever	1.04 (0.71–1.53)	1.14 (0.91–1.44)	1.29 (0.92–1.81)
Physical or emotional			
Never (ref)	1	1	1
Ever	0.67 (0.25–1.78)	0.83 (0.48–1.42)	0.51 (0.22–1.81)
Physical or sexual			
Never (ref)	1	1	1
Ever	0.81 (0.37–1.76)	0.92 (0.61–1.37)	0.71 (0.40–1.25)
Emotional or sexual			
Never (ref)	1	1	1
Ever	0.78 (0.38–1.59)	0.75 (0.49–1.14)	0.37 (0.18–0.73)
Physical, emotional or sexual			
Never (ref)	1	1	1
Ever	1.87 (0.64–5.43)	1.31 (0.72–2.37)	2.59 (1.05–6.39)

Notes: aOR- adjusted Odd Ratio. Model adjusted for women's age, marital status, parity, place of residence, employment status, wealth, smoking status, alcohol consumption and media exposure.

Results from Table 3 showed that women's exposure to any form of intimate partner violence was not significantly associated with the likelihood of being underweight or overweight relative to normal weight.

However, women who had ever experienced at least one form of IPV (i.e., physical, emotional, or sexual) were more likely to be obese (aOR = 2.59; 95% CI = 1.05–6.39) relative to normal weight women. The odds of being obese were also found to be higher among women with any prior exposure to emotional violence (aOR = 2.22; 95% CI = 1.16–4.13). Interestingly, the adjusted odds of being obese were lower among women who had ever experienced any emotional or sexual violence (aOR = 0.37; 95% CI = 0.18–0.73).

Dicussion

Discussion

This is the first study to explore the association between Zimbabwean women's exposure to IPV and nutritional status using ZDHS data collected from 2005–2015. Although prior studies in Zimbabwe have examined trends in prevalence of overweight and obesity [33] as well as associations between demographic characteristics, socioeconomic status and IPV against women [1], no study has investigated the complex relationship between IPV and nutritional status (i.e., underweight, overweight, and obesity) of women in the country. Moreover, the prevalence of both IPV and overweight is high in Zimbabwe [1, 33, 54, 55], which makes the country an appropriate setting for this study.

Overall, the findings revealed that more than one-third (43%) of women reported to have ever experienced at least one form of intimate partner violence, which is higher than the global estimated prevalence of 30% [1, 56]. Nevertheless, this finding is consistent with previous studies in Zimbabwe [1, 54, 57–59] and other Sub-Saharan African countries [60, 61]. Some of the risks for the high and increasing prevalence of IPV in developing countries have been attributed to cohabitation [62], rural residence [63, 64] and low economic status [65–67]. Poverty on the other hand has been shown to be a determinant of IPV [68, 69] as poor women tend to heavily depend on their partners [66, 69, 70], which may limit their bargaining powers.

Regarding the various forms of IPV, we found emotional and sexual violence to be the most popular forms of violence against women [54, 58]. Sexual violence may be low due to underreporting of such abuses in Africa [64, 71], stemming from traditional norms and beliefs [72].

The findings further revealed that women of reproductive age are at high risk of excess weight [31, 73, 74], as more than one-fifth reported being overweight and about 12% obese. Several studies have reported overweight and obesity to be on the rise in developing countries [29, 31, 33], and risk factors such as high economic status, urban residence [75, 76], and, indeed, intimate partner violence [77, 78] have been implicated.

Both intimate partner violence against women and obesity are growing health problems in low and middle-income countries (LMICs) [29–31, 49, 61, 73, 78]. Our findings showed that women who had ever experienced any form of IPV were more likely to be obese. Prior studies suggest that women who have been exposed to violence may experience negative psychological impacts [79, 80], which can lead to unhealthy food consumption and obesity [18]. Obesity affects women's participation in daily routines and

other physical activities [81–83] which can affect their participation in the labour market [80], and also impact on other health outcomes [79, 84].

Surprisingly, we did not find any significant association between IPV and underweight, relative to normal weight. While this finding is consistent with some studies [74, 85], others suggest that exposure to IPV increases the odds of being underweight [85, 86]. These inconsistent findings may be attributed to study population, demographic and socioeconomic contexts [18, 26, 85]. Meanwhile, the positive association between IPV and underweight has been associated with dietary behaviours characterized by substance abuse, insufficient calorie intake, or reduced food intake [26]. Furthermore, abusive partners may withhold food from victims, as a form of punishment which can negatively affect their weight [18, 26].

IPV and poor nutrition (underweight and overweight) are major determinants of health [87, 88], especially among women of reproductive age [89, 90]. While obesity has been shown to be a risk factor for non-communicable diseases such as diabetes and hypertension [91–93], IPV has been linked with mental health problems including traumatic stress [15, 94, 95] and injury [5, 20, 96]. These findings, including the results presented in the current study, should be taken into account for the development of policies aiming for the promotion of peace and security of women. Such policies need to address gender related health issues as well as opportunities and pathways to reduce gender inequity and gendered social and health problems including IPV.

Strengths And Limitations

The major strength of this study was that a nationally representative sample was used, where participants were sampled using probability sampling methods [59]. The range of relevant questions in the survey allowed for a detailed assessment of the IPV-obesity link in a large sample of women from Zimbabwe. Nonetheless, there are some limitations. First, due to the cross-sectional design of the DHS data, causality of associations between variables cannot be established. Longitudinal studies on exposure to IPV and the association with adverse health outcomes would be better suited for causal interpretation, although the currently available survey data already provide some convincing insights into the problem under investigation. Second, it has been shown that exposure to violence during childhood may increase subsequent exposures at adulthood [77, 97, 98], which may lead to excess weight. However, the study lacks data on violence experienced during childhood. Finally, it is likely that IPV reporting is hampered by issues of privacy, shame etc. This leads to information bias, and additional approaches to validate and enhance information on IPV experiences need to be considered [99–101].

Conclusion

The study findings showed that women of reproductive age in Zimbabwe are at high risk of both IPV and excess weight. Moreover, we found a positive relationship between IPV and obesity. Public health interventions that target the well-being, empowerment, and development of women are needed to address

the complex issue of IPV and adverse health outcomes, including obesity. Legal, social and health institutions should collaborate to develop and implement appropriate intervention measures.

Abbreviations

BMI- Body Mass Index

CI- Confidence Intervals

CT- Conflict Tactics

DHS- Demographic Health Survey

EAs- Enumeration Areas

IPV- Intimate Partner Violence

LMIC- Low and Middle-Income Countries

OR- Odd Ratio

UNICEF- United Nations Children's Fund

WHO- World Health Organisation

ZDHS- Zimbabwe Demographic and Health Survey

Declarations

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Availability of data and materials

The data used for this study came from the Demographic and Health Survey (DHS). Detailed information on the survey design and characteristics are provided on the DHS homepage, https://dhsprogram.com/Data/

Author Contribution

MIJ and NKA conceived the study. MIJ carried out extensive literature review and performed the statistical analysis with NKA. MIJ drafted the manuscript. MIJ, NKA, HZ, PM and SY critically revised and reviewed the manuscript. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

Consent for publication

Not applicable

Ethical consideration

The study was based on the secondary dataset with no identified information on the participants. The authors were granted approval from DHS Review Board to obtain and use the collected data for analysis.

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Figures

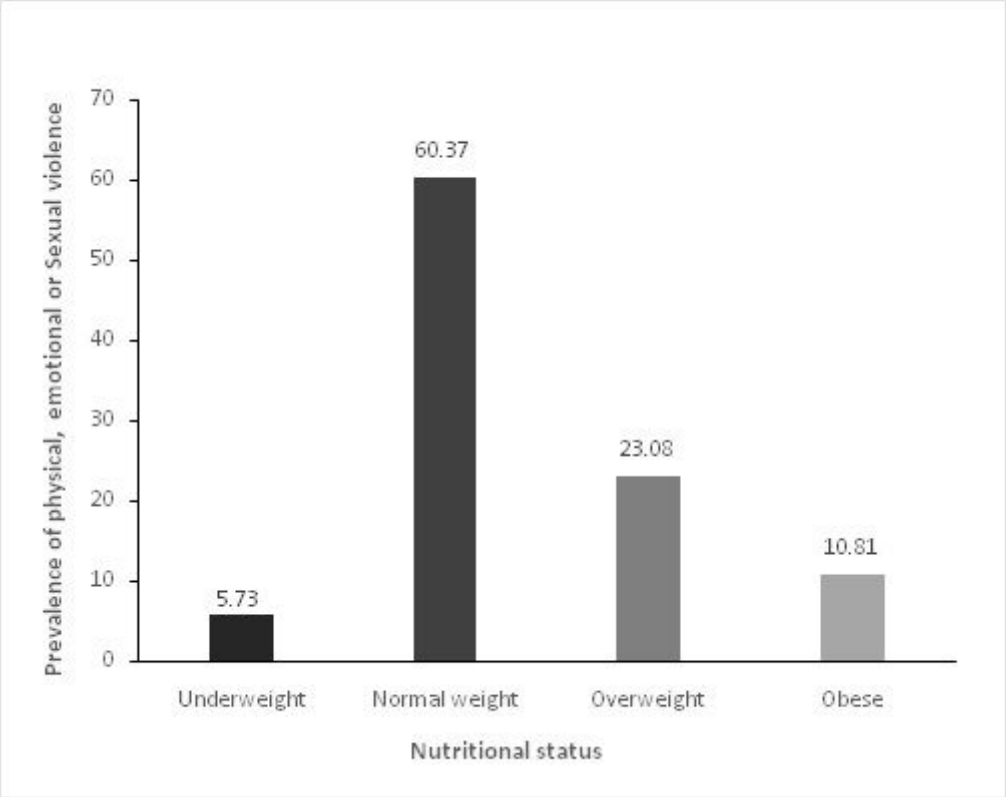

Figure 1

Prevalence of physical, emotional or sexual violence against women of reproductive age (15–49 years) by nutritional status, Zimbabwe, pooled data, 2005–2015.