Intimate Partner Violence on Women and Household Food Insecurity

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Abstract

In developing nations, there are elevated levels of intimate partner violence (IPV) directed at women. The human capital model of health demand posits that if IPV impacts women's health, it will diminish their health capital, leading to decreased productivity, lower earnings, and reduced production of goods relevant to their individual and household well-being. This paper aims to investigate the proposition that IPV on women has an effect on household food insecurity in Tanzania. Utilizing violence data from the first round of Tanzania's national panel survey along with food security data from the second round, this study examines that hypothesis. However, the findings do not provide robust empirical support for the idea that women's abuse significantly influences household food security, whether in rural or urban settings. The study suggests potential avenues for further research in this area.

Keywords: *intimate partner violence; productivity; food security*
JEL Classification: *J12; J24; Q18*

1. Introduction

Globally, the violation of fundamental human rights through domestic violence against women has been recognized (United Nations General Assembly, 1991). According to a report from the World Health Organization in 2013, approximately 35 percent of women have encountered violence during their lives, predominantly in the form of intimate partner violence (IPV). Developing countries exhibit higher rates of violence against women compared to developed nations (Garcia-Moreno et al., 2006). The economic repercussions of IPV on employed women, particularly in terms of employment stability, productivity, and earnings, are well-documented in existing literature (Lloyd, 1997; Smith, 2001; Tolman and Wang, 2005; Crowne et al., 2011; Adams et al., 2013; Vyas, 2013; Farmer and Tiefenthaler, 2015). While previous research has extensively explored the impact of IPV in the workplace, focusing on factors like absenteeism and distraction (Rothman and Corso, 2008; Reeves and O'Leary-Kelly, 2009), limited attention has been given to understanding how IPV affects the economic well-being of non-

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 ◆ *https://doi.org/10.56279/ter. v14i2.179*

employed women and their households. This study seeks to address this gap by examining the impact of IPV on household food security in a developing country context.

Estimates from the Food and Agricultural Organization reveal that 12.5 percent of the global population (868 million people) suffers from undernourishment in terms of energy intake (FAO, 2013). This results from both food shortages and the low nutritional value of available food. Malnutrition imposes a significant cost on the global economy due to lost productivity and direct healthcare expenses, estimated to be as much as 5 percent of the global GDP, equivalent to USD 3.5 trillion per year or USD 500 per person (FAO, 2013). In Tanzania, food insecurity levels are high and persistent, with the proportion of households classified as highly food energy deficient increasing from 24 percent to 29 percent between 2009 and 2011 (WFP, 2013).

Food security is a critical issue globally, with a stronger correlation between income and food insecurity in poorer countries. At the household level, access to food is a key factor influencing food security; and apart from income and poverty, little attention has been given to other contributors to household food insecurity, particularly in the context of health events. The traditional assumption in the literature is that food insecurity affects health outcomes, but there is limited exploration of the impact of health limitations on food insecurity (Gundersen et al., 2011).

The human capital model of health demand by Grossman (1972) suggests that ill-health reduces the time available for production activities, hindering productivity. Empirical studies have demonstrated the adverse effects of partner violence on women's physical, reproductive, and mental health (Golding, 1999; Huang, et al., 2011; Aizer, 2011). This study aims to analyze whether IPV inflicted on women jeopardizes household food security in Tanzania, considering the potential impact on the well-being of those engaged in subsistence food production.

This paper makes two contributions to existing literature. Firstly, it examines the impact of IPV on food insecurity, an aspect of economic well-being that has received less attention compared to other factors such as labor participation, employment stability, and earnings. While there are only three previous studies on the effect of domestic violence on food security (Chilton et al., 2013; Hernandez et al., 2014; Riberio-Silva et al., 2016), all conducted in developed economies, this study uses four binary measures of food insecurity to capture various aspects of the household food security situation. In addition, the paper uses four binary measures of food insecurity: food

uncertainty, reduction in food intake, change of diet to less-preferred food, and food shortage to capture different aspects that manifest the household food insecurity situation. Secondly, the analysis is conducted within the context of a developing country, recognizing the different socioeconomic environments between developed and developing nations and the higher prevalence of IPV in the latter. In developing countries, where most women are engaged in subsistence production and household chores without formal employment, the costs of IPV may differ from those in developed countries.

Using data on IPV toward women from the first wave of nationally representative data from the Tanzania National Panel Surveys (TNPS), collected in 2008/09, and match it with food insecurity data from the second wave of TNPS, collected in 2010/11. Other socioeconomic characteristics of the man and the woman, and that of the households, from the first wave data are controlled for. This study finds a positive but insignificant effect of IPV on most measures of food insecurity. The results suggest the need for future studies to explore household food heterogeneities, extend the time span, and address endogeneity issues in the relationship between IPV and food security.

The results suggest the need for future studies to explore household food heterogeneities, extend the time span, and address endogeneity issues in the relationship between IPV and food security. The subsequent sections of the paper provide background, literature review, and conceptual framework (Section 2), describe the data and empirical methods, and present the results (Section 3), followed by the conclusion (Section 4).

2. Conceptual Framework

Agriculture serves as the primary economic activity for 79 percent of women in developing countries (Doss, 2014). In households involved in the production of both food and cash crops, women are more likely than men to participate in the cultivation of food crops (World Bank, 2009). Women contribute a significant portion of their labor and non-labor income toward the well-being of the family and food-related expenses (Hoddinott and Haddad, 1995; FAO, 2006). Additionally, women play a crucial role in the processing and preparation of food within the household.

Despite their pivotal role in food production, women's productive potential remains underutilized for various reasons. One factor is the disparities in ownership of and access to agricultural inputs (World Bank, 2009; Deere and Doss, 2006). Another hindrance is violence against women, which can diminish their productivity and ability to sustain work (Browne et al., 1999; Swanberg et al., 2005). Additionally, there are instances of women being prevented from working or facing interference with their work efforts (Tolman

and Rosen, 2001). Failing to realize the full potential of women in production poses a risk to the household's food security status and overall welfare.

The connection between IPV and food security can be elucidated through the human capital model of health demand developed by Grossman in 1972. According to human capital theory, increases in an individual's knowledge and positive personal attributes enhance productivity in both the market sector (where money earnings are produced) and the non-market or household sector (where commodities contributing to one's utility function are produced) (Grossman, 2000). Health capital, a component of human capital, determines the total time available for market and nonmarket activities, as well as efficiency in performing those activities (Grossman, 1972). Therefore, the theory predicts that if IPV affects women's health, it will diminish their health capital, leading to reduced productivity, lower earnings in the market sector, and decreased production of commodities such as food that contribute to their individual and household utility functions.

The detrimental impacts of partner violence on women's physical and mental health have been extensively documented. Empirical studies provide evidence that IPV significantly decreases employment stability and productivity. Women experiencing physical IPV tend to have shorter employment durations (Browne et al., 1999; Adams et al., 2013) and work fewer hours annually (Tolman and Wang, 2005) compared to those not subjected to abuse. Furthermore, IPV is associated with lower earnings for affected women (Meisel et al., 2003; Adams et al., 2013; Vyas 2013; Farmer and Tiefenthaler, 2015). The link between IPV and reduced productivity is mediated by symptoms such as depression, decreased self-esteem, low concentration, chronic pain, overweight, obesity, and permanent disability (Browne et al., 1999; Tolman and Wang, 2005). These symptoms contribute to physical and cognitive fatigue, making it challenging for women to stay motivated and able to work for earning money, producing food, or organizing food preparation tasks (Chilton et al., 2014; Hernandez et al., 2014; Noonan et al., 2014).

3. Data, Empirical Estimation Strategy and Results

3.1 Description of Data

To assess the impact of violence against women on food security, data from the first and second waves of the Tanzania National Panel Survey is utilized. Data on IPV was collected from the first wave only, while data on household food security status was not recorded in the first wave, rather the second and consequent waves. The first wave data is matched with second-wave data, which includes food insecurity information but lacks a violence module. The first wave, conducted in 2008-2009, includes information on self-reported incidents of IPV among women aged 15-50 years. The violence questions are

drawn from the Conflict Tactics Scale developed by the World Health Organization and inquire about various acts of violence. The respondents answer 'YES' or 'NO' to questions regarding whether their current partner or any partner ever: *a) Slapped her or thrown something at that could hurt her; b) Pushed her or shoved her; c) Hit her with his fist or with something else that could hurt her; d) Kicked her, dragged her, or beaten her up; e) Choked or burnt her on purpose; f) Threatened to use or actually used a gun, knife, or other weapon against her; g) Physically forced her to have sexual intercourse when she did not want to; and h) forced to have sexual intercourse she did not want because she were afraid of what he might.*

If a respondent reported that she had ever experienced any of these acts, she was then asked if it had happened in the past 12 months. The study considers a woman to have experienced violence if she responds affirmatively to at least one of the eight violent incidents. Four binary measures of IPV are constructed: 'Lifetime IPV' if the respondent has ever experienced any violent incident, 'Current IPV' if an incident occurred in the past 12 months, and 'Severe violence' if the woman reports incidents categorized as severe [incidents c) to f)], and could be either lifetime or current.

Recognizing the potential for self-reporting bias in individual survey data on violence, precautions were taken during the interview process to minimize this risk. Interviews were conducted in private, ensuring no other individuals were present in the room simultaneously. Respondents were assured of the confidentiality of their responses, emphasizing that no one would learn about their answers, and the information would not be disclosed to their husbands, boyfriends, or parents. The interviewer, being a government agent unfamiliar to them and not from their community, further enhanced confidentiality.

Data on food security is derived from the second wave of the National Panel Survey of Tanzania, conducted in 2010-2011. Food security questions were directed to a household member primarily responsible for food decisions and preparation, often women in Tanzanian households. Eight questions were asked, and responses were grouped into five binary measures of food insecurity: (i) Experienced food uncertainty if in the past week there was concern that the household would not have enough for at least a day; (ii) Experienced undesired diets if in the past week the household relied on less-preferred foods or limited the variety of foods for at least a day; (iii) Experienced reduced food intake if in the past week the household limited portion size at meal-times; reduced the number of meals eaten in a day; or restricted consumption by adults so that small children could eat; (iv) Experienced lack of food if in the past week the household borrowed food, or relied on help from a friend or relative; had no food of any kind in the

household; or went a whole day and night without eating anything for at least one day; (v) Experienced food insecurity if in the past week the household experienced any of the above incidents of food insecurity.

In addition, we include other variables: (i) Women's socio-demographic variables: age, years of schooling; whether a woman owns land; marital status; and occupational alignment with their partners; (ii) Male partner characteristics, including age, years of schooling, and alcohol consumption in the past week; and (iii) Household characteristics: the education level of the most educated member, whether the household grows its staple food, the value of agricultural assets, and per capita monthly expenditure.

Table 1: Summary statistics

Variable	[1]	[2] Mean	[3]	[4] Difference
	ALL	RURAL	URBAN	Rural -Urban
Food Insecurity				
Food uncertainty	0.32	0.33	0.28	0.05**
Undesired diet	0.30	0.32	0.27	0.05**
Reduced intake	0.26	0.28	0.22	0.06***
Lack of food	0.12	0.13	0.09	0.03**
Food shortage	0.18	0.20	0.15	0.05**
Intimate Partner Violence				
Lifetime IPV	0.29	0.32	0.22	0.11***
Current IPV	0.17	0.18	0.13	0.05***
Lifetime Severe IPV	0.15	0.17	0.10	0.06***
Current Severe IPV	0.08	0.09	0.05	0.04***
Women' Characteristics				
Age	33.0	33.0	33.0	-0.05
Years of schooling	5.51	4.67	7.18	-2.51***
Own land	0.26	0.34	0.11	0.24***
Monogamy	0.76	0.74	0.78	-0.03
Polygamy	0.12	0.14	0.06	0.09***
Cohabiting	0.13	0.11	0.17	-0,06***
Same occupation	0.63	0.82	0.25	0.57***
Justify violence	0.60	0.63	0.53	0.10***
Male partner's characteristics				
Male age	40.9	41.0	40.81	0.17
Male years of schooling	6.36	5.48	8.11	-2.63***
Male takes alcohol	0.13	0.13	0.12	0.01

Variable	[1]	[2] Mean	[3]	[4] Difference
	ALL	RURAL	URBAN	Rural -Urban
Household characteristics				
Highest education	7.77	6.92	9.46	-2.53***
Household size	5.75	6.00	5.26	0.75***
% of Hh in working age (15-64 yrs)	0.55	0.52	0.62	-0.10***
Grows staple food	0.55	0.74	0.19	0.55***
Log value of agric assets	6.84	9.08	2.40	6.68***
Log expnd. per capita	13.20	12.98	13.64	-0.65***
Observations	1704	1133	571	

The final sample analyzed in this study comprises 1704 women currently in partnerships, residing in the same household as their partners, with both partners being interviewed, and the women responding to questions on violence. The initial sample included 3616 women who answered violence-related questions. Those not in a partnership and those whose partners did not reside in the same household or were not interviewed were excluded from the analysis. Out of the final sample, 1133 women are from rural areas, while 571 are from urban areas.

Table 1 displays the sample means for the data, categorized between the urban and rural areas. Across the entire sample, 32% of respondents expressed concern about their households not having enough food. A nearly identical percentage had to rely on less preferred foods or limit food variety. In various forms, 26% had to curtail their food intake, either by reducing meal size, cutting the number of daily meals, or restricting adult consumption. Approximately 12% faced food shortages and had to borrow or go without food at least once in the past seven days. In the preceding 12 months, 18% of respondents' households experienced situations where there wasn't enough food. Rural households exhibited significantly higher levels of food insecurity in all four aspects compared to their urban counterparts.

Regarding IPV, 29% of women reported experiencing IPV, with 17% encountering violence in the 12 months before the survey. Levels of violence were higher in rural areas than in urban areas, with 32% of rural women experiencing IPV in their lifetime compared to 22% in urban areas. Similarly, 18% of rural women reported IPV in the 12 months prior to the survey, compared to 13% in urban areas. These figures are notably elevated when compared to developed countries; for instance, Aizer (2010) reported an annual IPV prevalence of only two percent among women in the United States.

Summary statistics indicate that women in the sample are generally younger and less educated than their male partners. Around a quarter of women, mostly in rural areas, own land. A majority of women (60%) believe that a

man is justified in beating his wife under specific circumstances, including going out without informing him, neglecting the children, arguing with him, refusing to have sex, family problems, financial issues, lack of food at home, and other reasons. Overall, substantial differences exist between the rural and urban samples across various variables, prompting separate estimations for these two areas.

3.2 Empirical Estimation Strategy and Results

3.2.1. Analysis of driver of intimate partner violence on women

Probit regression model estimates for factors influencing IPV incidents, considering both violence ever experienced and violence encountered in the preceding year are presented first. Distinct estimations for the rural and urban samples are conducted due to observed differences between the two, suggesting that the marginal effects of explanatory variables may vary across these areas.

A probit model on the drivers of IPV on women is given by:

$$IPV = 1[F\alpha + M\beta + H\delta + \varepsilon > 0]$$

IPV is a binary indicator that takes the value of one if a woman has encountered intimate partner violence and zero otherwise. F represents a vector encompassing the woman's characteristics, M is a vector encapsulating the male partner's characteristics, and H is a vector encompassing household characteristics. α, β *and* δ are vectors of parameters to be estimated and ε is the error term.

Table 2 presents the marginal effects derived from probit estimates, elucidating the factors influencing intimate partner violence against women. The findings indicate that, in both rural and urban settings, male factors predominantly drive IPV. There is a significant negative correlation between the age of the male partner and IPV, suggesting that younger male partners are associated with a higher probability of their female partners experiencing IPV in both rural and urban areas. In rural settings, increased education of the male partner is linked to a higher likelihood of the female partner experiencing IPV, while in urban areas, the effect is negative. This suggests that in urban areas, more years of schooling may contribute to an understanding of the negative consequences of violence, potentially leading to its prevention, while in rural areas, it might be used as a means to augment male relative power and abuse. Men who consume alcohol are more likely to abuse their female partners in both rural and urban areas.

Polygamy is positively correlated with a higher likelihood of experiencing IPV at least once in a lifetime in both rural and urban areas, whereas cohabitation tends to increase the probability of experiencing lifetime and current IPV in urban areas. Higher education levels of the family member with the highest education are associated with a lower likelihood of women experiencing IPV

in rural areas. While income in rural areas is connected with a lower likelihood of women experiencing IPV, it is positively associated with IPV in urban areas.

Table 2: Marginal effects for driver of IPV on women in rural and urban Tanzania

VARIABLES	[1]	[2]	[3]	[4]	[5]	[6]
	Lifetime IPV			Current IPV		
	All	Rural	Urban	All	Rural	Urban
Woman's characteristics						
Age	0.0097*	0.0087	0.0128	-0.0015	0.0010	-0.0075
	[0.0056]	[0.0074]	[0.0108]	[0.0072]	[0.0095]	[0.0110]
Years of schooling	0.0192	0.0229*	0.0202	0.0184	0.0200	0.0197
	[0.0125]	[0.0137]	[0.0155]	[0.0152]	[0.0171]	[0.0231]
Owns land	0.1280	0.0573	0.3560**	0.1230	0.0692	0.3820
	[0.1190]	[0.1240]	[0.1800]	[0.1370]	[0.1390]	[0.3120]
Polygamy	0.4370***	0.4310***	0.3640*	0.1500	0.1080	0.3450
	[0.1150]	[0.1100]	[0.1980]	[0.1190]	[0.1270]	[0.2270]
Cohabiting	0.2090*	0.1330	0.3880***	0.2750***	0.2370*	0.3790**
	[0.1080]	[0.1170]	[0.1400]	[0.0938]	[0.1330]	[0.1570]
Same occupation	0.0469	-0.1510	0.0735	-0.0675	-0.240**	0.0699
	[0.1200]	[0.1420]	[0.1220]	[0.0965]	[0.1220]	[0.1170]
Male partner's characteristics						
Male age	-0.0183***	-0.0175***	-0.0178*	-0.0188***	-0.0230***	-0.0106
	[0.0049]	[0.0060]	[0.0108]	[0.0046]	[0.0060]	[0.0078]
Male years of schooling	0.0324*	0.0534**	-0.0338*	0.0084	0.0427**	-0.0747***
	[0.0182]	[0.0208]	[0.0193]	[0.0209]	[0.0201]	[0.0235]
Male takes alcohol	0.4130***	0.4210***	0.2920	0.4010***	0.3970***	0.3380**
	[0.1070]	[0.1230]	[0.2180]	[0.0992]	[0.1360]	[0.1430]
Household characteristics						
Highest education	-0.0920***	-0.0959***	-0.0577*	-0.0702**	-0.0999***	-0.0121
	[0.0278]	[0.0338]	[0.0337]	[0.0297]	[0.0246]	[0.0463]
Prop. of working age	0.0104	-0.0738	0.1530	0.1120	-0.0041	0.2660
	[0.2250]	[0.2490]	[0.3760]	[0.2660]	[0.2970]	[0.4650]
Household size	-0.0023	-0.0055	0.0070	-0.0000	-0.0072	0.0293
	[0.0148]	[0.0135]	[0.0408]	[0.0185]	[0.0147]	[0.0493]
Log expnd. per capita	-0.0399	-0.1000	0.2710**	-0.1260	-0.2350**	0.2070
	[0.0866]	[0.1000]	[0.1150]	[0.0985]	[0.0986]	[0.1300]
Observations	1,703	1,133	571	1,703	1,133	571
Pseudo R2	0.0515	0.0449	0.0737	0.0559	0.0643	0.0754

Clustered robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

3.2.2. Analysis of the effect of IPV on food insecurity

This sub-section examines the effect of IPV on food insecurity. For all the I estimate the measures of food insecurity the effect of IPV is estimated using a standard univariate probit model, given as follows:

$$FI^* = 1[\alpha IPV + X\beta + \varepsilon > 0]$$

FI^* is a latent index driving the outcome of being food insecure, *FI*, where *FI=1* if $FI^* > 0$ and *FI=0* if $FI^* < 0$. The value of the unobserved latent variable FI^* depends on IPV, which is a binary indicator equal to one if a woman experiences IPV and zero otherwise; X is a vector of the woman's characteristics, the male partner's characteristics, and household characteristics; α *and* β are vectors of parameters to be estimated; and ε is the error term.

In all estimations we use clustered standard errors at household level to account for observations (women) from the same households which may not be independently and identically distributed

When examining the relationship between IPV and household food security, two potential endogeneity concerns arise. The first concern involves reverse causality, where household food insecurity may serve as a contributor to partner violence. However, the data's natural structure mitigates this issue, as IPV is considered as a lagged variable. By utilizing the violence module from the initial wave of panel data and food insecurity information from the subsequent wave, a modest approach is adopted to address this endogeneity concern (Hernandez, 2016).

The second potential issue pertains to the non-random selection of women into violent relationships. Observable and unobservable differences may influence both women's encounters with partner violence and household food insecurity, leading to potential endogeneity due to self-selection. The estimated effect of IPV might encompass not only the true impacts of experiencing IPV but also the influence on food insecurity stemming from unobservable characteristics. While the comprehensive dataset allows control for various observable variables influencing these relationships, accounting for unobservable factors, such as traditional norms and income and asset distribution between partners, remains challenging, complicating the inference of a causal relationship.

Although instrumental variable strategies could potentially address these issues, the absence of a credible instrumental variable in this study limits their application. However, it is crucial to note that even examining the

correlation between women's experiences of violence and household food insecurity provides valuable insights into the costs associated with IPV.

The results of the probit estimation regarding the impact of IPV on food security measures are presented in Tables 3-7. These tables detail the marginal effects of IPV on binary measures of food insecurity. Tables 3 and 4 report the probit estimation marginal effects of current and lifetime women's experience of violence on binary measures of food insecurity – food uncertainty, shift to undesired diets, reduced food intake, and lack of food – for rural and urban areas, respectively.

Table 3: Marginal effects of current and lifetime IPV on food insecurity in rural areas

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
VARIABLES	**Food uncertainty**		**Undesired diet**		**Reduced food intake**		**Lack of food**	
Current IPV	0.0434		0.0521*		0.0469		0.0251	
	[0.0493]		[0.0305]		[0.0391]		[0.0183]	
Lifetime IPV		0.0491*		0.0354		0.0248		-0.0018
		[0.0285]		[0.0332]		[0.0271]		[0.0187]
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Month of interview	YES	YES	YES	YES	YES	YES	YES	YES
Agro Eco Zones	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,119	1,119	1,119	1,119	1,112	1,112	1,112	1,112

NOTES: The controls include: Woman and man's age and years of schooling; dummies for whether a woman owns land, whether a man takes alcohol, whether the household grows its own staple food and whether a man and a woman are in the same occupation; marital status, household size, proportion of household members of working age, value of household's agricultural assets, and household monthly expenditure per capita. Clustered robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

In rural areas, the marginal effects of both current and lifetime IPV on food insecurity exhibit positive trends (with the exception of the association between lifetime IPV and lack of food), but none of these effects attain statistical significance at the 5% level. This suggests that women's experience of abuse is not significantly linked to food insecurity in rural areas.

In rural areas, as depicted in Table 3, although both current and lifetime intimate partner violence (IPV) show tendencies to increase food insecurity (with the exception of the association between lifetime IPV and lack of food

which is negative), none reach statistical significance at the 5% level. This suggests that women's experience of abuse might not be a major factor contributing to food insecurity in rural settings. Potential explanations could involve stronger support systems from the family and community, alternative coping mechanisms, or different economic structures compared to urban environments.

Turning to urban areas, Table 4 presents these effects. In this context, both current and lifetime IPV demonstrate positive and statistically significant effects on reduced food intake. Moreover, lifetime IPV specifically positively correlates with a lack of food. Although other associations show positive effects, they don't reach statistical significance at the 5% level. Overall, IPV demonstrates a significant positive correlation with severe food insecurity indicators in urban settings. Potential explanations include economic control by the perpetrator, restricted access to resources due to IPV, and the psychological toll of abuse leading to food insecurity among victims in urban settings.

Table 4: Marginal effects of current and lifetime IPV on food insecurity in urban areas

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
VARIABLES	**Food uncertainty**		**Undesired diet**		**Reduced food intake**		**Lack of food**	
Current IPV	0.0437		0.0237		0.0989***		0.0489	
	[0.0509]		[0.0450]		[0.0334]		[0.0301]	
Lifetime IPV		0.0728		0.0567		0.111***		0.0441**
		[0.0500]		[0.0426]		[0.0309]		[0.0185]
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Month of interview	YES	YES	YES	YES	YES	YES	YES	YES
Agro Eco Zones	YES	YES	YES	YES	YES	YES	YES	YES
Observations	565	565	571	571	567	567	540	540

NOTES: The controls include: Woman and man's age and years of schooling; dummies for whether a woman owns land, whether a man takes alcohol, whether the household grows its own staple food and whether a man and a woman are in the same occupation; marital status, household size, proportion of household members of working age, value of household's agricultural assets, and household monthly expenditure per capita. Clustered robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

Tables 5 and 6 present the marginal effects from probit estimation of current and lifetime women's experience of 'severe' violence on binary measures of food insecurity in rural and urban areas, respectively. The marginal effects of

'severe' IPV on food insecurity for most of the measures are not significant in either rural or urban areas.

Table 5: Marginal effects of Severe Current and Lifetime IPV on food insecurity in rural areas

VARIABLES	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Food uncertainty		Undesired diet		Reduced food intake		Lack of food	
Severe Current IPV	-0.0129		0.0335		0.0328		-0.0241	
	[0.0466]		[0.0397]		[0.0444]		[0.0287]	
Severe Lifetime IPV		-0.0236		-0.0310		-0.0314		-0.0413*
		[0.0268]		[0.0281]		[0.0339]		[0.0234]
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Month of interview	YES	YES	YES	YES	YES	YES	YES	YES
Agro Eco Zones	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,119	1,119	1,119	1,119	1,112	1,112	1,112	1,112

NOTES: The controls include: Woman and man's age and years of schooling; dummies for whether a woman owns land, whether a man takes alcohol, whether the household grows its own staple food and whether a man and a woman are in the same occupation; marital status, household size, proportion of household members of working age, value of household's agricultural assets, and household monthly expenditure per capita. Clustered robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

Table 6: Marginal effects of Severe, Current and Lifetime IPV on food insecurity in urban areas

VARIABLES	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Food uncertainty		Undesired diet		Reduced food intake		Lack of food	
Severe Current IPV	0.1260		0.0669		0.1170***		0.0427	
	[0.0784]		[0.0503]		[0.0388]		[0.0412]	
Severe Lifetime IPV		0.1030*		0.0639*		0.1010***		0.0271
		[0.0573]		[0.0340]		[0.0392]		[0.0280]
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Month of interview	YES	YES	YES	YES	YES	YES	YES	YES
Agro Eco Zones	YES	YES	YES	YES	YES	YES	YES	YES
Observations	565	565	571	571	567	567	540	540

NOTES: The controls include: Woman and man's age and years of schooling; dummies for whether a woman owns land, whether a man takes alcohol, whether the household grows its own staple food and whether a man and a woman are in the same occupation; marital status, household size, proportion of household members of working age, value of household's agricultural assets, and household monthly expenditure per capita. Clustered robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

Lastly, all the aspects of food insecurity are combined into one binary measure. A household is categorized as food insecure if it encountered at least one of the four incidents mentioned earlier. Subsequently, the effect of current and lifetime IPV, as well as severe current and lifetime IPV, on this composite food insecurity variable is assessed. The marginal effects stemming from this estimation are detailed in Table 7.

Table 7: Marginal effects of IPV on combined food insecurity aspects in rural and urban areas

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	RURAL				URBAN			
VARIABLES	Food insecurity		Food insecurity		Food insecurity		Food insecurity	
Current IPV	0.0545				0.0767			
	[0.0418]				[0.0601]			
Lifetime IPV		0.0385				0.0909*		
		[0.0357]				[0.0487]		
Severe Current IPV			-0.0288				0.1830***	
			[0.0502]				[0.0582]	
Severe Lifetime IPV				-0.0610**				0.1190**
				[0.0302]				[0.0466]
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Month of interview	YES	YES	YES	YES	YES	YES	YES	YES
Agro Eco Zones	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,119	1,119	1,119	1,119	571	571	571	571

NOTES: The controls include: Woman and man's age and years of schooling; dummies for whether a woman owns land, whether a man takes alcohol, whether the household grows its own staple food and whether a man and a same occupation; marital status, household size, proportion of household members of working age, value of household's agricultural assets, and household monthly expenditure per capita. Clustered robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

Table 7 indicates limited evidence supporting a correlation between IPV and food insecurity. Notably, only severe current and lifetime abuse exhibit a significant correlation with food insecurity in urban areas. Conversely, an unexpected result emerges in rural areas, where severe lifetime violence is actually correlated with lower levels of food insecurity.

4. Conclusion

In developing countries, IPV rates are notably high, with approximately 29 percent of women in Tanzania having experienced violence from their intimate partners. Existing literature extensively details the physical, reproductive, and mental repercussions of such violence on women. Drawing from the human capital model of health demand, which posits that health

capital influences an individual's productivity in both market and nonmarket activities, it is hypothesized in this study that IPV affects household food insecurity in Tanzania.

The data employed in this study is derived from the first wave of the Tanzania National Panel Survey, conducted in 2008/09, featuring a violence module but lacking information on food security. This dataset is matched with second-wave data, which includes food insecurity information but lacks a violence module. Binary violence variables are classified into lifetime and current violence, further categorized based on the severity degree. For food insecurity, four binary measures—food uncertainty, reduction in food intake, undesired diets, and lack of food—are constructed, along with a combined binary measure incorporating all four aspects.

Contrary to the predictions of the human capital theory, this study does not find empirical evidence supporting the hypothesis that IPV significantly impacts household food insecurity, whether in rural or urban areas. Potential explanations for this discrepancy include the relatively short timeframe of the food security information (spanning the past seven days). It could also be that there is heterogeneity in food insecurity among household members which cannot be observed in this study. So, while the household food situation is not affected by IPV, some member's food situation might be affected. Another reason could be that abused women have adopted some adjustment mechanisms to cope with the situation and live a normal life, or do some extra things such as ensuring food is on the table by any means to avoid further violence.

The study acknowledges limitations related to potential endogeneity issues in estimating the effect of IPV on food insecurity. While the lagged nature of the IPV data addresses concerns of reverse causality, the non-random selection of women into violent relationships poses a challenge, with unobservable variables influencing this selection. Instrumental variable techniques were not employed due to the lack of credible instruments. As a result, the study refrains from asserting causality and focuses on correlations, recognizing their relevance in understanding the costs associated with IPV. Future research on IPV and food security is encouraged to explore within-household food disparities, examine coping mechanisms adopted by abused women, extend the time frame, and address endogeneity concerns.

I do not find empirical support for the hypothesis that IPV affects household food insecurity in either rural or urban areas. One possible reason that I do not find the effect predicted by human capital theory is that the food security information was a response to what happened in the past seven days. This

span might be too short to disentangle the effect of IPV. It could also be that there is heterogeneity in food insecurity among household members which cannot be observed in this study. So, while the household food situation is not affected by IPV, some member's food situation might be affected. Another reason could be that abused women have adopted some adjustment mechanisms to cope with the situation and live a normal life, or do some extra things such as ensuring food is on the table by any means to avoid further violence.

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