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Original Article

Disability and intimate partner violence: A cross-sectional study from Mwanza, Tanzania

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ABSTRACT

Background: Women with disabilities are at heightened risk of experiencing intimate partner violence [IPV], although the mechanisms through which disability acts as a risk factor for IPV are not clear.
Objective: We analyzed cross-sectional data (n = 867) from Wave 3 of the MAISHA longitudinal study, conducted in Mwanza, Tanzania, to i) describe the levels of disability and IPV amongst women, and ii) to assess the association between level and type of disability and IPV experience.
Methods: IPV was assessed using the WHO Multi-Country study instrument. Levels of disability (none, mild and severe) were categorized based on responses to the Washington Group Short Set questions. We fitted logistic regression models to determine the risk of experiencing each type of IPV according to disability level and type of disability.
Results: We found significant associations between mild and severe disability and different types of IPV. For example, in multivariate analyses controlling for socio-demographic variables, women reporting severe disability were significantly more likely to report physical and/or sexual IPV, sexual IPV. controlling behaviors, economic IPV, and severe IPV, whereas for mild disability compared to no disability, physical and/or sexual IPV, sexual IPV, and economic IPV were significantly more likely to be reported. Cognitive disability was a significant correlate of all forms of IPV apart from physical IPV.
Conclusions: Our findings that specific types of disability and not others were associated with an elevated risk of IPV exposure indicate the need for nuanced measurement and analysis of the association between disability and IPV.

Intimate partner violence [IPV] is the most common form of violence experienced by women and girls worldwide. Nearly one in three women aged 15 and older globally have experienced IPV in their lifetime.[1] A strong evidence base indicates significant lifelong physical and mental health impacts due to women's experience of IPV, including depression and anxiety,[2,3] negative sexual and reproductive health outcomes[4,5] and chronic pain and injuries.[6]

Evidence indicates that women with disabilities are at higher risk for experiencing IPV than women without disabilities. A recent systematic review of quantitative evidence found a consistently higher prevalence of any type of IPV against women with any type of disability compared to women without disability.[7] This finding aligns with other systematic reviews that also indicated a heightened risk of adults with disability to interpersonal violence.[8,9] However, existing systematic reviews often do not account for how gender can influence the dynamics and prevalence of women's risk of IPV.[10]

Heightened vulnerability to IPV amongst women with disabilities may be due to women's reliance on partners for care and social

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exclusion of women with disabilities.[11] Macro-level factors, including societal perspectives on disability and discrimination against women with disability in social and economic realms, may also act to heighten the risk of IPV for women with disabilities.[12] These factors may all operate to increase duration and severity of IPV amongst women with disabilities, compound the impact of IPV against women with disabilities and increase barriers to reporting IPV or seeking help of any form.[12–14] Curry et al. (2000) propose that environmental and cultural factors, such as exclusion from economic opportunities and discrimination in health systems and services, impact various aspects of partner and non-partner violence against women with disability.[15] Existing theories and conceptual frameworks accounting for the association between disability and IPV are based on evidence derived from Western, high-income contexts. Given vast differences in social constructions of disability, different patterns of gender and social norms, and different forms of services and interventions available for women with disability in low and middle-income countries [LMICs], further understanding of the intersections and pathways in LMIC settings is needed.

While the majority of the evidence base on women with disabilities and IPV is from studies conducted in high-income contexts,[16–19] evidence is emerging for the role of disability as a risk factor for women's experience of IPV in LMIC settings specifically. A study utilizing data from the Uganda 2011 and 2016 Demographic and Health Surveys found that women reporting one or multiple disabilities were significantly more likely than women not reporting any disability to experience each of emotional, physical and sexual IPV, and that women with disability and exposure to IPV reported elevated risks of poor sexual and reproductive health outcomes.[20] In a study of factors associated with recent IPV experience amongst women in Afghanistan, women who reported higher level of severity of disability reported higher levels of emotional IPV and physical IPV.[21] A study of recent IPV experience, depression and disability amongst post-partum women in a clinic in South Africa indicated that mobility-related disability, and not other forms of disability, were associated with IPV experience.[22] Level of disability may influence association with specific types of IPV experience; a study conducted in Nepal found that the strength of association between IPV experience and disability increased with the severity of disability reported. In addition, associations with specific types of IPV differed by the extent of disability; women with severe impairment reported higher levels of physical and/or sexual, emotional, and economic IPV than women without a disability, whereas women with some impairment compared to no disability reported higher levels of economic IPV only.[23] Level of disability was also important in findings from Ghana, which indicated that the association between disability and physical, sexual, emotional and physical and/or sexual IPV was stronger for women who reported severe disability compared to women who reported mild disability.[24] Pooled analysis of baseline data from 8,156 women participating in IPV prevention trials in LMICs (Nepal, South Africa, Afghanistan, Rwanda, and Ghana) found elevated odds of 1.93 of experiencing economic, emotional, physical, sexual, physical and/or sexual IPV for women with disabilities across all settings, compared to women without disabilities.[25]

Despite emerging interest and research on the intersection of disability and IPV in LMIC settings, there are significant evidence gaps. A recent scoping review of measurement of violence against women and disability globally found that few studies explore several different types of disability. Literature primarily focuses on women with one type of disability, or assesses a number of disabilities grouped together for the purposes of analysis.[26] Evidence of how or if specific types of disability are related to elevated risk of IPV experience amongst women is limited. This is particularly important given there is evidence from high-income settings showing that some forms of disability and not others are associated with IPV.[27,28] Existing studies tend to focus on the association between disability and physical and/or sexual IPV, and there is less evidence concerning emotional violence, economic violence, and controlling behaviors. Disability is the interaction between physical and/or mental impairment and social context, that is, the extent to which disability is associated with IPV will reflect a range of contextual social and structural factors.[24] Given that the vast majority of evidence on disability and IPV against women is from studies in high-income settings, further research on the association between IPV and disability in specific LMIC settings is needed, to shed light on how this association operates in specific contexts. These findings are vital to inform the development and implementation of effective programming for women with disabilities affected by IPV.

In this paper, we therefore aim to i) describe the prevalence of disability within a representative sample of women in Mwanza, Tanzania, and ii) assess the association between level and type of disability and different forms of IPV in this sample.

Methods

Study setting

The study was conducted in Mwanza city, North-West Tanzania. Recent estimates of global, regional, and national IPV indicate that Tanzania has a past year prevalence of physical and/or sexual IPV amongst women aged 15–49 of 24% and lifetime prevalence of physical and sexual IPV in the same population of 38%.[29] There is no research that has considered the role of disability as a risk factor for IPV experience in Tanzania despite high prevalence of disability in Tanzania, and evidence that disability status influences disparities in sexual and reproductive health.[30]

Sample

The MAISHA cluster randomized controlled trials evaluated the impact of a social empowerment prevention program on IPV risk.[31] Following the post-intervention data collection, women in the control arm of the trials were asked if they were willing to participate in a follow-up study and were interviewed again at two later time points (Wave 3 and Wave 4). At Wave 3, questions on disability were included in the study. A total of 1008 women were interviewed, of which 867 women were included in the current analysis as they reported being married or cohabiting at the time of the survey or having been in a relationship within the past 12 months.

Data collection

Interviews were conducted face to face by trained female interviewers and in private. The questionnaires included questions on different types of IPV, disability, and other demographic and behavioral characteristics. The questionnaires were translated into Swahili and independently back-translated into English. Interviewers recorded women's responses directly onto tablet computers and data were uploaded daily to a secure database and checked by the data manager.

Measures

Outcome measure – IPV

The survey instrument included items from the WHO Multi-Country Study Instrument, to assess the following forms of intimate partner violence in the past 12 months: physical violence (7

acts), sexual violence (3 acts), controlling behaviors (5 acts), economic violence (3 acts) and emotional violence (4 acts). Table 1 displays the items used to assess each form of violence, as well as the items utilized to define severe violence. For each type of violence, a binary variable was created – for example, exposure to physical IPV was operationalized as a respondent indicating that any of the physical IPV acts had occurred in the past 12 months, and the non-exposure group women had not experienced any of the physical IPV acts in the past 12 months.

Main exposure variable – disability types and levels

Disability was assessed using the Washington Group Short Set of Disability Questions,[32] a series the questions based on the World Health Organization's International Classification of Functioning, Disability and Health [ICF] as a conceptual framework. The questions were: do you have difficulty hearing, even if using a hearing aid; do you have difficulty seeing, even if wearing glasses; do you have difficulty walking or climbing steps; do you have difficulty remembering or concentrating; do you have difficulty (with self-care such as) washing all over or dressing; and using your usual (customary) language, do you have difficulty communicating, for example, understanding or being understood. The possible response categories were: i) no difficulty, ii) some difficulty, iii) a lot of difficulty, and iv) cannot do at all. We analyzed disability in two ways. For the first way, we created a variable with three mutually exclusive categories:

i) No disability: reported 'no difficulty at all' to all items
ii) Mild disability: reported 'some difficulty' to at least one item; and
iii) Severe disability: reported 'a lot of difficulty' or 'cannot do at all' to at least one item.

This approach to analyzing disability using the Washington Group questions has been used in other analyses, for example, Gupta et al.'s study in Nepal.[23]

We also analyzed each type of disability individually. For each question, we created a binary variable – yes, if the participant's response was having some difficulty, a lot or cannot do at all, and no if the response was no difficulty. Binary variables for vision, hearing, mobility, and cognition were included in the main analysis; as self-care and communication disability types had a very small prevalence of less than 5%, and hence could not be included in the models.

Other control variables

The following socio-demographic variables were included as control variables within multivariate analyses: women's age, marital status (married or cohabiting with a man vs. in a relationship in the past 12 months), education level (primary level and below vs. secondary level and above), working in the past 12 months, partners age, partner's education level (primary level and below vs. secondary level and above) and whether the partner

Table 1
IPV items.

Type of violence	Items
Physical violence	In the past 12 months, has your current partner or any other partner: • Slapped you or thrown something at you that could hurt you? • Pushed you or shoved you or pulled your hair? • Hit you with his fist or with something else that could hurt you? • Kicked you, dragged you, or beaten you up? • Choked or burnt you on purpose? • Threatened to use or actually used a gun, knife, or other weapon against you? • Has hit you or beaten you with (hard) objects such as belts, hairbrush, or canes?
Sexual violence	In the past 12 months, has your current partner or any other partner: • Forced you to have sexual intercourse by threatening you, holding you down, or hurting you in some way? • Had sexual intercourse when you did not want to because you were afraid that your partner would hurt you or someone you cared about if you refused? • Had sexual intercourse when you did not want to because you were afraid that your partner would leave you or take another girlfriend if you refused?
Emotional violence	In the past 12 months, has your current partner or any other partner: • Insulted you or made you feel bad about yourself? • Belittled or humiliated you in front of other people? • Done things to scare or intimidate you on purpose (e.g. by the way he looked at you, by yelling and smashing things) • Verbally threatened to hurt you or someone you care about?
Economic violence	In the past 12 months, has your current partner or any other partner: • Refused to give you enough money for household expenses, even when he had money for other things? • Taken money that you have earned away from you • Made important financial decisions without consulting you
Controlling behaviors	In the past 12 months, has your current partner or any other partner: • Tried to keep you from seeing your friends • Tried to restrict contact with your family of birth • Insisted on knowing where you are at all times • Been jealous and angry if you spoke with another man • Been suspicious of your faithfulness
Severe violence	In the past 12 months, has your current partner or any other partner: • Kicked you, dragged you, or beaten you up? • Choked or burnt you on purpose? • Threatened to use or actually used a gun, knife, or other weapon against you? • Forced you to have sexual intercourse by threatening you, holding you down, or hurting you in some way? • Had sexual intercourse when you did not want to because you were afraid that your partner would hurt you or someone you cared about if you refused? • Had sexual intercourse when you did not want to because you were afraid that your partner would leave you or take another girlfriend if you refused?
Recent physical and/or sexual violence	Yes to physical and/or sexual violence.

worked in the past 12 months. Other control variables were Component A or B – whether the woman had participated in microfinance groups during the trial (Component A) or not (Component B); household socioeconomic status [SES], an indicator derived as a latent variable from 19 indicators collected in the questionnaire, including education, ownership of household items and household earnings; and household economic stress, a binary variable created based on women's responses to the following: worried/stressed about the general financial situation or having trouble buying food or other necessities, had to borrow money to pay rent or other bills or need to see a doctor but could not, children miss school because of not having school fees, uniform, or supplies; and children gone a whole day without eating because there was not enough food in the house. These variables were selected as control variables based on previous research and hypotheses regarding their influence on IPV experiences and potential associations with the level of disability.

Analysis

There were no missing data on all disability measures and IPV outcomes, and less than 5% missingness on socio-demographic variables. Descriptive statistics were calculated using proportions and means. We assessed the association between the prevalence of each type of IPV (controlling behavior, emotional, economic, physical, sexual, sexual, and/or physical and severe IPV) with disability levels (none, mild and severe) using chi-square tests. Also, we assessed the association between each type of IPV and disability type: cognition, hearing, mobility, and vision.

Logistic regression models including age as a control variable were fitted to determine the risk of experiencing IPV according to disability level and disability types, given age and disability are highly correlated. Odds ratios (ORs) with their corresponding 95% confidence Intervals (95% CIs) were estimated. We built separate models with each type of IPV, physical and/or sexual IPV combined, and severe violence as outcome variables. To obtain the adjusted odds ratios for each IPV type, multivariate logistic regression models were fitted with disability types/levels as the main exposure and other socio-demographic characteristics.

Each model followed this specification

log (odds)IPV $= \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3$ ….where X1 is a disability variable (5 total) and the outcome is one of the IPV variables (7 total), and X2 onwards are control variables.

Ethical considerations

The data collection was approved by the Tanzanian National Health Research Ethics Committee of the National Institute for Medical Research (Ref: NIMR/HQ/R.8a/Vol. IX/1512), the medical faculty of the Ludwig-Maximilians-University Munich (Ref: 21–0507) and the London School of Hygiene & Tropical Medicine (Ref:11642). All data collection procedures followed World Health Organization recommendations on research on violence against women.[33] All study participants provided written informed consent. For illiterate participants, this process was witnessed by an independent person prior to administering the survey.

Table 2
Socio-demographics by disability level.

Characteristics	Overall n = 867	No disability n = 470	Mild disability n = 331	Severe disability n = 66	*P*-value*
Enrollment					
Component A	342 (39.5%)	172 (37%)	138 (42%)	32 (48%)	0.10
Component B	525 (60.5%)	298 (63%)	193 (58%)	34 (52%)	
Age (Years), Mean (SD)	38.1 (8.8)	35.76 (7.82)	40.57 (9.02)	42.87 (9.48)	**<0.01**
Womens age group					
<30	158 (18.5%)	110 (24%)	42 (13%)	6 (9%)	**<0.01**
30-39	329 (38.5%)	205 (44%)	106 (32%)	18 (28%)	
40-49	289 (33.8%)	129 (28%)	134 (41%)	26 (40%)	
50+	78 (9.1%)	17 (4%)	46 (14%)	15 (23%)	
Missing = 13					
Married/living with man as if married	736 (84.9%)	401 (85%)	279 (84%)	56 (85%)	0.92
Women's primary level and below (Missing: 13)	**639 (74.8%)**	**322 (70%)**	**262 (80%)**	**55 (85%)**	**0.001**
Woman worked for money in the past 12 months	779 (89.8%)	417 (89%)	303 (92%)	59 (89%)	0.43
Socioeconomic Status quantile score					
1'st Quantile	168 (20%)	87 (19%)	63 (20%)	18 (30%)	0.25
2′nd Quantile	169 (20%)	101 (22%)	60 (19%)	8 (13%)	
3′rd Quantile	161 (19%)	84 (19%)	63 (20%)	14 (23%)	
4′th Quantile	159 (19%)	85 (19%)	60 (19%)	14 (23%)	
5′th Quantile	173 (21%)	92 (20%)	74 (23%)	7 (11%)	
Missing = 37					
Household stress					
Yes	714 (82.4%)	365 (78%)	288 (87%)	61 (92%)	**0.0002**
No	153 (17.6%)	105 (22%)	43 (13%)	5 (8%)	
Partner's age group					
<30	75 (9%)	59 (13%)	14 (5%)	2 (3%)	**<0.01**
30-39	276 (34%)	183 (41%)	80 (26%)	13 (22%)	
40-49	281 (35%)	143 (32%)	115 (38%)	23 (39%)	
50+	177 (22%)	60 (13%)	96 (31%)	21 (36%)	
Missing = 65					
Partner's education					
Primary level and below	545 (63%)	294 (63%)	206 (62%)	45 (68%)	0.66
Secondary and above level	321 (37%)	176 (37%)	124 (38%)	21 (32%)	
Do not know	36 (4.2%)				
Missing = 7					
Partner worked for money in the past 12 months (Missing: 65)	757 (96%)	424 (98%)	280 (93%)	53 (95%)	**0.0013** <0.05

*A p-value <0.05 denotes statistical significance.

Results

The mean age of the 867 women in this sample was 38.1 (SD: 8.8). Most of the women were married or living with a partner (n = 736, 84.9%), attended at least primary level and below of education (n = 639, 74.8%), worked for money in the past 12 months (n = 779, 89.8%) and experienced household economic stress (n = 714, 82.4%). 54% of the sample reported having no difficulty with any of the disability items, indicating no disability; 38% of the sample reported mild disability, while 66 respondents (8%) reported a lot of difficulty or cannot do at all to at least one of the items (severe disability). 215 women (24.8%) reported vision disability, 36 (4.2%) reported hearing disability, 139 women (16.0%) reported mobility disability, and 183 women (21.1%) reported cognition disability. Only 11 (1.3%) reported self-caring disability and 8 women (0.9%) reported communication disability. Table 2 displays socio-demographic variables by disability level. Statistical tests indicated significant differences in proportion between disability levels by age, women's level of education, household economic stress, partners' age, and partner working in the past 12 months, with increasing level of severity of disability associated with lower level of education and higher reported household economic stress. Prevalence of recent experiences of economic IPV and sexual IPV was higher in women with higher levels of disability [Table 3].

Risk of IPV and disability

Table 4 presents age-adjusted odds ratios from models examining each type of IPV exposure, comparing mild disability to no disability and severe disability to no disability. Women with mild disability and severe disability were significantly more likely to report sexual IPV compared to women with no disability. Economic IPV was significantly increased for women with mild and severe disability.

Table 4 also displays each distinct disability type and IPV exposure. We found that having a cognitive disability significantly increases the odds of experiencing all forms of violence, with the highest odds being exposure to economic IPV. Mobility disability was significantly associated with sexual IPV, economic IPV, controlling behaviors, physical and/or sexual IPV, and severe IPV. Hearing disability was only significantly associated with economic violence. Vision disabilities were not associated with any IPV type.

Table 5 displays adjusted odds ratios for each model. In adjusted models, women with mild disability were more likely to report physical and/or sexual IPV, sexual IPV, economic IPV, and severe IPV. Women with severe disability were significantly more likely to report physical and/or sexual IPV, sexual IPV, controlling behaviors, economic IPV, and severe IPV.

In multivariate analyses, cognitive disability remained a significant correlate of all forms of IPV apart from physical IPV. Women with a cognitive disability were two times more likely to report economic IPV compared to women with no cognitive disability. Women with a cognitive disability were also significantly more likely to report physical and/or sexual IPV, sexual IPV, controlling behaviors, emotional IPV, and severe IPV. Mobility was also associated with physical and/or sexual IPV, economic IPV, severe IPV, and the highest risk toward sexual IPV. Women with a mobility disability had 164% more risk of experiencing sexual IPV compared to women with no mobility disability. Hearing disability was only associated with increased odds of experiencing sexual IPV. As in age-adjusted analyses, vision disability was not associated with any type of IPV exposure.

Discussion

In this cross-sectional study of women participating in a longitudinal study in Mwanza city, Tanzania, we found that amongst the 867 women, at least 46% of the women reported some kind of disability. We identified elevated odds of experiencing various types of IPV for women with higher levels of disability, especially economic IPV.

The prevalence of disability in our sample may constitute an underestimation of women living with severe disability in this setting. The specific sample in this study, and in many population-based surveys, are unable to detect and include women who live with severe levels of disability due to barriers to recruitment, inability to complete consent procedures, lack of comprehension or hearing of questions, and lack of capacity to come to specific places to be interviewed. Social exclusion and isolation common amongst women with severe disabilities may act to exclude these women from research on IPV, further compounding marginalization due to lack of evidence concerning their experiences of violence.

Women with mild disability compared to women with no disability in our study reported significantly increased odds of experiencing physical and/or sexual IPV, sexual IPV, economic IPV, and severe IPV. Women with severe disability also reported significantly more controlling behaviors by their partners. In contrast to many studies of disability and IPV, we explored multiple types of IPV. The findings indicate that across levels and types of disability, consistent significant associations were found with economic IPV. Economic violence may result in financial hardship and reduced economic independence for women, limiting options to leave an

Table 3
IPV exposure by disability level.

	Overall	No disability	Mild disability	Severe disability	*P*-value
IPV type					
Controlling behavior	579 (66.8%)	307 (65%)	222 (67%)	50 (76%)	0.24
Emotional violence	416 (48.0%)	220 (47%)	162 (49%)	34 (52%)	0.70
Economic violence	339 (39.1%)	139 (30%)	119 (36%)	33 (50%)	**<0.005**
Physical violence	717 (82.7%)	390 (83%)	273 (82%)	54 (82%)	0.96
	150 (17.3%)	80 (17%)	58 (18%)	12 (18%)	
Sexual violence	737 (85.0%)	414 (88%)	273 (82%)	50 (76%)	**<0.01**
	130 (15.0%)	56 (12%)	58 (18%)	16 (24%)	
Sexual and/or physical violence	655 (75.6%)	364 (77%)	246 (74%)	45 (68%)	0.2100
	212 (24.4%)	106 (23%)	85 (26%)	21 (32%)	
Severe violence	295 (80.2%)	388 (83%)	259 (78%)	48 (73%)	0.0932
	172 (19.8%)	82 (17%)	72 (22%)	18 (27%)	

Chi-square test: *P < 0.1, **P < 0.005.
*A p-value <0.05 denotes statistical significance.

Table 4
Age adjusted odds ratios for differences in likelihood of reporting IPV amongst women with different levels and types of disability.

Disability level and type	Physical/sexual IPV	Physical violence	Sexual violence	Controlling behavior	Economic violence	Emotional violence	Severe violence
	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)
No disability (Ref)							
Mild disability	1.43 (1.01, 2.02)*	1.22 (0.84, 1.81)	1.96 (1.29, 2.97) *	1.36 (0.99, 1.87)	1.55 (1.13, 2.13) *	1.29 (0.95, 1.73)	1.58 (1.09, 2.29) *
Severe disability	2.26 (1.25, 4.09) *	1.49 (0.74, 2.99)	3.36 (1.73, 6.52) **	2.35 (1.26, 4.39) *	3.17 (1.83, 5.50) **	1.63 (0.95, 2.81)	2.44 (1.31, 4.55)*
Vision	1.04 (0.71–1.54)	1.19 (0.77–1.84)	1.09 (0.68–1.73)	1.21 (0.85–1.71)	1.07 (0.75–1.51)	1.08 (0.78–1.51)	0.92 (0.60–1.41)
Hearing	1.32 (0.62–2.81)	0.84 (0.32–2.21)	2.11 (0.96–4.66)	1.85 (0.82–4.15)	1.99 (1.01–3.95) *	1.06 (0.53–2.10)	1.48 (0.67–3.24)
Mobility	1.86 (1.21–2.84) *	1.12 (0.67–1.88)	3.11 (1.95–4.98) **	1.56 (1.03–2.37) *	2.05 (1.39–3.02) **	1.38 (0.94–2.03)	2.25 (1.45–3.50) **
Cognition	1.83 (1.26–2.66) *	1.59 (1.04–2.43) *	2.21 (1.45–3.38) **	1.71 (1.17–2.50) *	2.48 (1.76–3.51) **	1.72 (1.22–2.42) *	2.17 (1.47–3.21) **

*P < 0.05 **P < 0.01.

Table 5
Odds ratios for differences in likelihood of reporting IPV amongst women with different levels and types of disability, adjusted for women's age, marital status, education level, working in the past 12 months, household stress, household SES, partners age, partner's education level, partner worked in the past 12 months and component A & B.

Disability type	Physical/sexual IPV	Physical violence	Sexual violence	Controlling behavior	Economic violence	Emotional violence	Severe violence
	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	OR (95% CI)
No disability (Ref)							
Mild disability	1.47 (1.01, 2.16)*	1.29 (0.84, 1.97)	1.92 (1.21, 3.05)*	1.32 (0.93, 1.86)	1.43 (1.01, 2.04)*	1.15 (0.82, 1.60)	1.60 (1.06, 2.42)*
Severe disability	1.98 (1.01, 3.86)*	1.35 (0.62, 2.95)	2.70 (1.25, 5.81) *	2.28 (1.14, 4.55)*	2.70 (1.44, 5.02) **	1.23 (0.69, 2.34)	2.10 (1.02, 4.30)*
Vision	1.05 (0.69–1.59)	1.21 (0.76–1.94)	1.09 (0.65–1.80)	1.24 (0.85–1.81)	0.99 (0.68–1.43)	1.01 (0.70–1.44)	0.92 (0.58–1.45)
Hearing	1.42 (0.62–3.28)	0.75 (0.25–2.25)	2.50 (1.03–6.05) *	1.82 (0.74–4.46)	1.82 (0.84–3.94)	0.91 (0.42–1.98)	1.66 (0.69–3.98)
Mobility	1.59 (1.01–2.51)*	0.89 (0.51–1.57)	2.64 (1.58–4.39) *	1.52 (0.98–2.38)	1.60 (1.05–2.43) *	1.12 (0.74–1.69)	1.90 (1.18–3.07) *
Cognition	1.71 (1.15–2.55)*	1.49 (0.95–2.34) (0	1.99 (1.26–3.15) *	1.70 (1.13–2.56) *	2.18 (1.50–3.18) *	1.62 (1.12–2.35) *	2.01 (1.32–3.06) *

*P < 0.05 ** < 0.01.

abusive partner.[34] A scoping review of the impacts of economic IPV on women's health and well-being outcomes found studies that assessed the association between economic IPV and financial hardship, debt, damaged credit, and material hardship. Studies consistently showed that economic IPV is associated with immediate and long-term economic hardship amongst women.[35] Our study shows that women with mild or severe disability, or mobility or cognitive disability, are more vulnerable to economic IPV. A qualitative study on women's perceptions of and experiences of economic IPV in this context, conducted as part of the larger project within which this study is embedded, found that women perceived several actions perpetrated by men as part of economic IPV – including spending money irresponsibly, and added the category "refusal to contribute" to the three more commonly used categories of economic IPV (economic control, employment sabotage and economic exploitation).[36] We did not include items reflecting refusal to contribute in this study, and as such, prevalence of economic IPV overall, and for women with disabilities in particular, may be much higher. Economic IPV has often been conceptualized as a form of emotional violence or understood as a result of gender inequality more generally.[37] Our results indicate that economic IPV is a distinct form of violence for which disability severity and mobility and cognitive disability are risk factors.

Consistent associations were also found with sexual IPV. Women with disabilities in this study may, due to reliance on partners, lack of economic independence, and social isolation, be less likely to question a partner's 'right' to have sex with her, and experience higher levels of sexual violence due to lack of escape from situations of coercive control. Whereas some other studies have hypothesized that women with disabilities also face higher risk of controlling behaviors,[20] we found that only women with severe disability and with mobility disability reported increased odds of experiencing controlling behaviors.

Our analysis is unique in that in addition to assessing the level of disability and IPV, we also explored associations between specific types of disability and types of IPV experienced. Mobility and cognition were the most consistently associated with elevated odds of various types of IPV exposure over the past 12 months. This finding may reflect specific social norms around disability that operate in this setting. Both mobility and cognitive disabilities could be highly associated with dependence on a partner, forming the basis of a woman's reliance on her male partner to fulfill household tasks, including childcare, shopping for food, and cooking. A qualitative study of risk and social norms concerning women with disability and IPV in the Democratic Republic of Congo and Myanmar found that when presenting vignettes of women with disabilities, a woman with a physical disability was often perceived by respondents as a possible economic burden to the household, unable to fulfill and exacerbating power differentials between men and women,[38] resulting in greater vulnerability to IPV. The conceptual frameworks accounting for partner and non-partner violence against women with disabilities indicate the role of attitudes toward disability broadly, and toward women with disabilities specifically, in driving violence perpetration.[11,39,40]

The results of our analysis have policies and programmatic implications for programs to prevent and respond to IPV against women with disabilities in this setting. Firstly, disability is consistently associated with economic and sexual violence more than other forms of violence. Efforts to address women's economic dependence in the context of mobility or cognitive disability may play a role in reducing economic violence against women with disabilities. Such programs should be carefully designed and implemented. Findings from this context indicate that women who earn more than their partners experience more IPV, and as such, economic empowerment programming needs to be carefully designed and implemented to ensure that the interventions do not inadvertently increase IPV.[41] Prevention and response to sexual violence against women with disabilities require strong and accessible sexual and reproductive health service, yet evidence indicates that women with disabilities face significant barriers accessing sexual and reproductive health services.[42] Addressing physical barriers to access in health centers and training health care

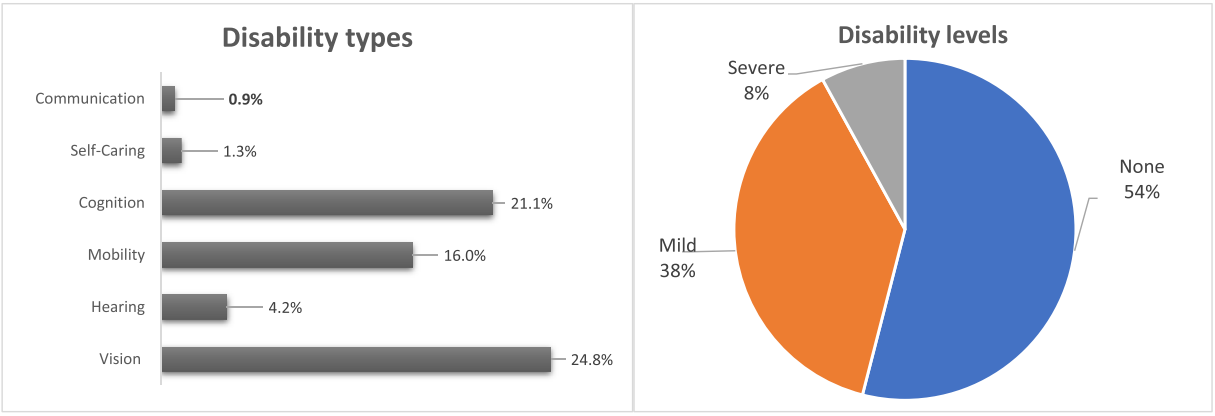

Fig. 1. Prevalence of disability type and disability levels (n = 867).

workers to be able to respond to the needs of women with disabilities may address barriers to access. Secondly, recent findings indicate that IPV prevention interventions have the same results – whether positive or no effect – for women with disabilities as for women without disabilities.[43] This finding indicates that concerted efforts to include women with disabilities in general IPV prevention and response programming can be effective. While barriers exist to full participation for women with disabilities in prevention programming, program implementers were able to find ways to address participation and inclusion.[44] Future programming should integrate such approaches, including intentional use of language, and formulating program implementation, for example, training and structure of sessions, as well as addressing physical access barriers, in inclusive ways.

These findings should be interpreted in light of some limitations. This is a cross-sectional analysis, and the directionality of associations between disability and IPV cannot be established; self-reported disability may be a result of experiencing IPV. However, existing evidence indicates that the direction of association between disability and IPV experience explored in this paper is plausible[45] Low cognitive disability in the sample may be a result of The Washington Group Questions, which have been widely used in censuses and studies, and may not reliably identify individuals who screen positive clinically for moderate or greater impairment.[46] The study was not powered to detect specific types or levels of disability, and therefore there are some groups of disability for which we could not conduct analysis given small sizes, and some groups (in particular, severe level of disability) where some identified associations may be by chance given a relatively small sample size. One of the strengths of the analysis is that it included multiple forms of IPV exposure outcomes, which allowed insight into the association between disability and economic IPV, for example, in this sample. Another strength of the analysis is the assessment of specific types of disability and their associations with IPV, which goes beyond many analytical approaches which only look at disability as a binary variable, or as a variable with different levels of severity. However, analysis of co-occurrence of specific types of disability was beyond the scope of the present analysis. Women included in the sample were selected to be part of the MAISHA trial control group; results may not be fully generalizable to women across Tanzania; however, are largely representative of women living in Mwanza, Tanzania.

Conclusion

Amongst women participating in this study in Mwanza, Tanzania, the level and type of disability were associated with increased risk of several types of IPV. Our finding mobility and cognitive disabilities, and not vision and hearing disabilities, were associated with an elevated risk of IPV exposure provides insight into potential mechanisms that explain disability as a risk for IPV and can inform policy and programming for prevention and response services. Alongside additional research on the associations between disability and IPV risk in other LMIC settings, these findings indicate the need for sustained investment in programming to address the heightened risk of IPV amongst women with disability (Fig. 1).

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Conflicts of interest

All the authors indicate that they hold no conflicts of interest in relation to this publication.

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