Journal of Family Violence
https://doi.org/10.1007/s10896-024-00706-y

ORIGINAL ARTICLE

The Association Between Depression, Suicidal Thoughts and Intimate Partner Violence Perpetration Among Young Men in Mwanza, Tanzania

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Accepted: 4 June 2024

Abstract

Purpose Depression and suicidal thoughts are associated with intimate partner violence, a major public health problem. Yet little is known about this association among young men in sub-Saharan Africa. This study aims to investigate the relationship between depression, suicidal thoughts and intimate partner violence perpetration, among young men in Tanzania from a representative community-based sample.

Methods We conducted a cross sectional survey among 1002 young men aged between 18 and 24 years residing in Mwanza city, Tanzania. Participants were randomly selected from 6 wards that included 3 densely and 3 sparsely populated wards from the Ilemela and Nyamagana districts that were selected using a probability-based multi-stage cluster sampling approach. We collected data on participant's socio-demographics, depression symptoms using the PHQ9, suicidal thoughts, other psychosocial factors, and perpetration of different forms of intimate partner violence. Analysis was done using Stata version 17.0 and restricted to 828 participants who self-reported being in intimate relationships in the past twelve months. Bivariate and multivariable logistic regression models were employed to determine the association between the outcome variables with intimate partner violence perpetration and other psychosocial factors.

Results Out of 828 young men, 333(40.2%) reported depressive symptoms and 93(11.9%) suicidal thoughts, with 725(87.6%) reporting ever perpetrating any form of intimate partner violence and 653(78.9%) reporting it in the past 12 months. After adjusting for other factors in multivariable models, depressive symptoms were significantly associated with sexual intimate partner violence perpetration (aOR = 2.19, 95%CI = 1.57, 3.04), economic intimate partner violence perpetration (aOR = 1.32 95%CI = 1.01, 1.74), emotional intimate partner violence perpetration (aOR = 1.76, 95%CI = 1.26, 2.46) and controlling behaviours (aOR = 1.46 95%CI = 1.10, 1.93).

Conclusions Depression is a common health problem strongly associated with intimate partner violence perpetration in this study population. Effective interventions to address depression and other mental health problems may help to reduce intimate partner violence perpetration in this population.

Implications Researchers and practitioners should develop theory-based research and intervention programmes to address mental health problems such as depression and suicidal thoughts and the perpetration of intimate partner violence. The socio-ecological framework provides an insightful model for multiple level analysis and intervention.

Keywords Intimate partner violence · Depression · Suicidal thoughts · Young men · Violence perpetration

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Published online: 14 June 2024

Background

Depression is a major public health problem among men, with a prevalence of 5.5% in 2017 (WHO, 2017) and with an increase of up to 25% in 2020 during the COVID-19 pandemic (WHO, 2022). Depression presents with feelings of sadness, a depressed or irritable mood, feelings of low self-worth or guilt, loss of interest or pleasure, decreased energy, disturbed sleep or appetite, and poor concentration (del Barrio, 2004). Suicidal thoughts become apparent through contemplations, wishes and preoccupations with death and suicide. It is one of the three components of suicidal behaviours, next to suicide attempts, the actual event of trying to kill oneself, and completed suicide when death occurs (Castle & Kreipe, 2007; del Barrio, 2004). In most cases, suicidal thoughts are accompanied by intense feelings of depression, hopelessness, or self-destructive behaviours (Castle & Kreipe, 2007; WHO, 2017).

Depression and suicidal thoughts are linked to the perpetration of intimate partner violence (IPV) against women (Devries et al., 2013; Machisa & Shamu, 2018; Stark et al., 2020; Yu et al., 2019). Men's perpetration of IPV against women is both a public health and human rights issue with devastating effects on their physical, mental, and emotional health (García-Moreno & Stöckl, 2009). IPV perpetration is embedded in gender and structural inequalities (Heise, 1998). Globally, one in four women experience physical and/or sexual IPV perpetrated by men in their lifetime (Sardinha et al., 2022). In sub-Saharan Africa, women face one of the highest lifetime levels of physical and/or sexual IPV and non-partner sexual violence (Sardinha et al., 2022). Tanzania in particular has very high levels of IPV perpetration, with a study conducted in Mwanza establishing a 61% prevalence of physical and or sexual IPV perpetrated against women in the last 12 months (Kapiga et al., 2017).

Depression is associated with increased risk of IPV perpetration but could also be an outcome of men's perpetration of IPV against women (Chatterji & Heise, 2021). A systematic review of mental disorders and the perpetration of IPV reported that men with depression have 2.8 times increased odds of ever perpetrating physical IPV against their female partners (Oram et al., 2014). Suicidal thoughts in men are described as an important risk factor for their loss of life by actual suicide (King et al., 2020). Suicide incidences are often preceded by IPV perpetration (Kafka et al., 2022; Machisa & Shamu, 2018; Wolford-Clevenger et al., 2017; Yu et al., 2019). A recent study that used a sub-sample of 2440 suicides from the North Carolina Violent Death reporting system found that 17.8% of all suicides were precipitated by IPV perpetration and or experience, with 81.3% of the deceased being men, and among those 72.7% being men with a history of IPV perpetration (Kafka et al., 2022).

Despite studies establishing a connection between depression and suicidal thoughts with IPV perpetration, there are still important gaps in the understanding of these relationships. Specifically, there is lack of clarity on how these relationships emerge among different age groups. To the best of our knowledge, none of the existing studies from low- and middle-income countries have examined the relationship between depression and suicidal thoughts with IPV perpetration with an exclusive focus on young men from a large representative community sample. This is crucial as young adults are more prone to mental health problems such as depression and suicidal thoughts (Gustavson et al., 2018; Jenkins et al., 2010; King et al., 2020; Marcus et al., 2012). Our study therefore seeks to examine the association between depression, suicidal thoughts and IPV perpetration among young men aged between 18 and 24 years in a low income setting of Mwanza, Tanzania.

Theoretical Framework

Our study draws on a social-ecological framework for mental health (Kousoulis & Goldie, 2021) to understand the relationship between depression and suicidal thoughts with IPV and other factors. This framework utilizes interactive factors at the individual, relational, community and societal levels that interact and influence an individual's mental health conditions. It integrates those factors suggested by Lakhan and Ekúndayò's concept (2013) to be associated with depression at an individual level, namely gender, age, education, genetics, alcohol and substance abuse and at the relational level, including marital/relationship status, experiences and perpetration of violence and food security as well as the community and societal levels, capturing experiences of adverse event, policies and norms. The interactive effects between these factors determine and influence the level of depression in an individual. To understand suicidal thoughts in the context of the ecological framework, we integrate the concept of Cramer and Kapusta's (2017) framework for assessing and preventing suicide. They proposed a model that comprises suicide risk factors operating at the individual, clinical, interpersonal, situational and demographic levels of the social ecological model. This includes factors such as gender, social support, experiences of adverse childhood events, economic and employment status (see Fig. 1). The association of those factors with depression and suicidal thoughts and their interplay with IPV perpetration are grounded in the social learning theory, gender power theory and the psychoanalytic theories. The social learning theory posits that men who witness IPV among their parents or who have been abused during childhood model this behaviour later in life, either because they lack non-violent methods to deal with conflicts, or because they seek peers and partners

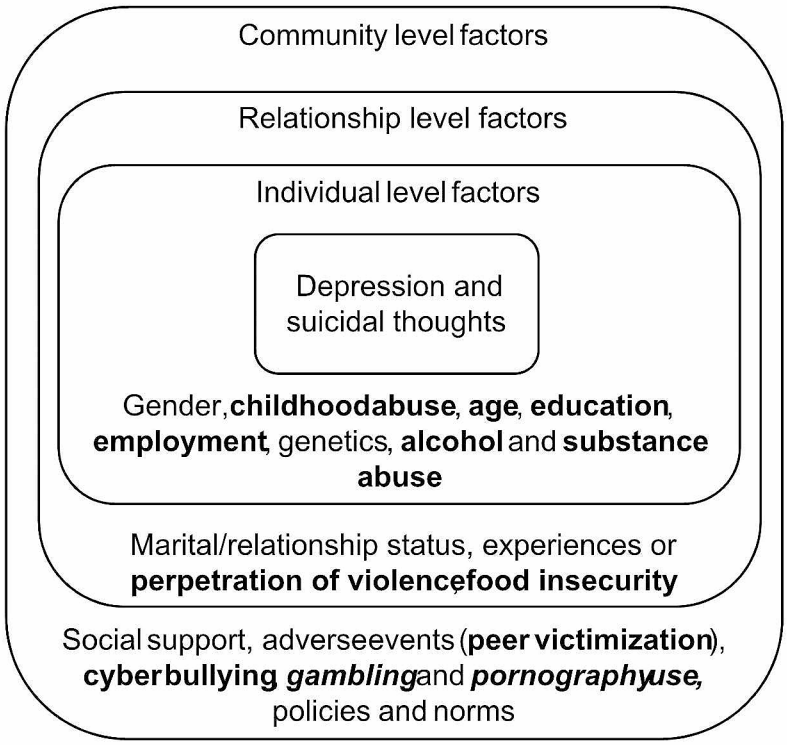

Fig. 1 Factors associated with depression and suicidal thoughts

who are like their parents. Violence and depression share the same structural and social-psychological antecedents as experiences of abuse early on in life may negatively impact reflective appraisal capacities of people, thereby providing an important link between depression and IPV perpetration (Coster 2003). Gender power theory on the other hand relates many health outcomes of men, including depression and IPV to be closely linked to their views on what it means to be a man, with that being associated with economic success, toughness, sexual activeness, and risk taking behaviour, including alcohol and substance abuse, or gambling (Jewkes and Morell, 2010). On the other hand, psychoanalytic theories approach the onset of depression and IPV from a trauma perspective. Early childhood experiences such as disruptions in nurturing during critical attachment phases in the first years of life, can later manifest in intrapsychic deficits that result in perpetration of IPV or depression and suicidal thoughts if they cannot achieve the control they crave for in interpersonal relationships (Zosky, 2005). Therefore, in this analysis, we employ the socio-ecological model as it allows us to incorporate learnings from the social learning theory, gender power theory and the psychoanalytic theories that operate at different levels of the socio-ecological framework.

Our study builds on the research question, "What is the association between depression, suicidal thoughts and IPV perpetration among young men aged between 18 and 24 years in Mwanza, Tanzania?". We hypothesize that young men who report perpetrating intimate partner violence are also more likely to report symptoms of depression and higher levels of suicidal thoughts, even after controlling for other factors known to be associated with depression and suicidal thoughts.

Methods

Study Design and Setting

A cross-sectional study of 1002 young male adults residing in Ilemela and Nyamagana districts of Mwanza city, Tanzania was conducted between June 2021 and March 2022.

Mwanza is the second largest city in Tanzania and is located on the southern shores of Lake Victoria. Due to its strategic location as an economic hub, Mwanza is a cosmopolitan city that has attracted a wide range of ethnic groups from different parts of the country. These groups subscribe to a range of complex norms of masculinity and patriarchal practices perpetuating gender inequality between men and women (Mshana et al., 2021, 2022). Examples of such norms include entitlement and acceptance of male partner's sexual requests and male decision-making authority over their female partners (Howard-Merrill et al., 2020; Pulerwitz et al., 2006). Such norms put pressure on men to fulfil

expectations on being the family breadwinners and to be strong, dominant, and in control, making it harder for them to seek help for their mental health problems (Ogueji et al., 2020).

Study Sampling and Participant Recruitment

A probability based multi-stage cluster sampling approach was used to select wards, administrative units within a district, then streets, households and later participants for inclusion in the study. We generated a list of all the wards in Ilemela and Nyamagana districts in Mwanza city. From the list of 37 wards (administrative areas), we excluded 13 wards where another study on violence against women was being conducted (Kapiga et al., 2017). Thereafter, we stratified the wards into densely and sparely populated strata and randomly selected 3 wards from each. A random sample of four streets per ward, a total of 24 streets, was selected, with three wards in Ilemela and three in Nyamagana district. Field workers visited all selected streets with the help of street leaders and marked the boundaries using the Global Positioning System (GPS) coordinates. Thereafter, 120 GPS coordinates were randomly generated within each street using Q-GIS software. The coordinates were randomly ordered, then visited in sequence from the first to the last one.

Houses within 100 meters of the coordinates were visited and a list of eligible participants was prepared from those households. The eligibility criteria included being a Tanzanian man aged 18–24 years and having been residing in Mwanza for not less than 3 months. The field team visited a total of 2,976 households and from those 1,065 had young men meeting the eligibility criteria while 1,911 did not. If more than one young man in the selected household met our survey criteria, a random selection of survey participants was conducted by having a family member randomly pick one of the names of young men living in the household that were written on folded paper. From the list compiled, seven declined to participate, 14 had agreed to participate but were not available or reachable during the survey period and 42 were excluded for having moved away from Mwanza during the survey. Therefore, the survey included and interviewed 1002 young men who provided informed consent.

Data Collection

Data was collected using six trained male research assistants using a standardized questionnaire in Swahili, Tanzania's national language. Depressive symptoms and suicidal thoughts were the main outcome variables. To assess depressive symptoms, we used the Patient Health Questionaire-9 (PHQ-9) tool, a standardized tool with total scores ranging from 0 to 27. A score of 0–4 was categorized as none or minimal symptoms of depression, 5–9 as mild, 10–14 as moderate, 15–19 as moderately severe, and 20–27 as severe. In the analysis, the symptoms of depression variable were re-coded into a binary variable combining the mild, moderate, moderately severe and severe into one group and none or minimal symptoms of depression as the second group. The PHQ-9 depressive screening tool was chosen because is has been translated and validated in Swahili (Omoro et al., 2006). Suicidal thoughts were assessed by using one of the questions from the PHQ-9 tool and the two questions from the Context of Violence in Adolescent Cohort (CoVAC) Adolescent questionnaire (Devries et al., 2020). The two questions asked whether there was a time in the past month when they had serious thoughts about ending their life and whether they had ever in their whole life tried to kill themselves or made a suicide attempt. A binary variable was generated to define presence or absence of suicidal thoughts, a "yes" response to any of the three questions about the suicidal thoughts indicated presence of suicidal thoughts.

The main covariate, IPV perpetration in the past 12 months was captured in five different dimensions: physical, sexual, economic, emotional abuse and controlling behaviour. The questions on controlling behaviour, economic abuse, psychological abuse and physical abuse were taken from the Sonke Change Trial questionnaire (Christofides et al., 2020) and adapted. Similar questions were also used in the Intervention with Microfinance for AIDS and Gender Equity (IMAGE) study (Fulu et al., 2013), the COVAC study in Uganda (Devries et al., 2020) and the UN multi-country cross-sectional study on men and violence which validated the questions among men in different cultural settings to capture male perpetration of IPV (Fulu et al., 2013). We also added a question on spreading rumours under psychological abuse from the COVAC study in Uganda (Devries et al., 2020). These surveys represent the main studies on men's perpetration of violence in intimate partner relationship in low- and middle-income countries and the categorization of the acts followed those studies (Table 1), which were confirmed by a confirmatory factor analysis. The prevalence of different forms of IPV perpetration was defined using a binary variable based on a "yes" response to any of the IPV perpetration questions. The creation of the binary categories for depression, suicidal thoughts and IPV perpetration study variables has been used mainly by other studies that examined these variables in South Africa, Rwanda, and Malawi (Chatterji & Heise, 2021; Fulu et al., 2013; Machisa & Shamu, 2018). Due to the sensitivity of questions related to IPV perpetration, participants were handed tablets to self-complete these questions with the help of audio recordings and colour-coded responses. Participants were given headphones with audio-recorded instructions and IPV

Table 1 Questions on Male IPV perpetration in the last 12 months

1. Controlling behaviours
a. Have you insisted on knowing where your partner is at all times in the past twelve months?
b. Have you tried to restrict or reduce your partner having contact with her family or friends in the past twelve months?
c. Have you checked and controlled your partner's mobile phone in the past twelve months?
d. Have you told your partner what to wear and how to behave in the past twelve months?
2. **Economic violence**
a. Have you made important financial decisions without your partner in the past twelve months?
b. Have you prohibited your partner from getting a job, going to work, trading or earning money in the past twelve months?
c. Have you taken your partner's earnings against her will in the past twelve months?
3. **Emotional violence**
a. Have you spread rumours about your partner or tried to turn her friends against her in the past twelve months?
b. Have you spoken to your partner in a mean (hostile) tone of voice in the past twelve months?
c. Have you insulted your partner or deliberately said things to make her feel bad about herself in the past twelve months?
d. Have you made fun of your partner, belittled her or humiliated her in front of other people in the past twelve months?
e. Have you ever tried to scare or intimidate your partner on purpose, for example by the way you looked at her, by shouting, or by smashing things?
f. Have you threatened to hurt or actually hurt people your partner cares about as a way of hurting her, or damage things of importance to her?
4. **Physical violence**
a. Have you slapped, pushed or shoved your partner or thrown something at her that could hurt her in the past twelve months?
b. Have you ever hit your partner with a fist or something else that could hurt her, kicked, dragged, beaten, choked or burned her in the past twelve months?
c. Have you ever threatened to use or actually used a gun, knife or other weapon against your partner in the past twelve months?
5. **Sexual Violence**
a. Have you forced your partner to have sex with you when she did not want to in the past twelve months?
b. Have you had sex with your partner when you knew she didn't want it, but you believed she should agree because she was your wife/partner in the past twelve months?
c. Have you ever forced your partner to do something sexual that she did not want to in the past twelve months?

perpetration questions. The audio recording first instructed them to listen to the questions carefully, then click a green coloured circle with the thumb-up sign in front for a "yes" response, click a red coloured circle with a thumb-down sign for a "no" response, and swipe the screen backwards or forward to listen to the next or previous question respectively. At the end of the questions, the audio instructed them to hand over the tablet to the participant for the next sections. This method has been used in other studies and has proven to help capture sensitive information about the use of severe violence among male perpetrators (Christofides et al., 2020). Table 1 outlines questions used to access different forms of IPV perpetration.

Confounders were chosen according to the underlying ecological framework for depression and suicidal thoughts. Figure 1 displays those in bold represent factors available in our dataset. We have added gambling and pornography use, although not explicitly stated in the respective frameworks as they represent factors linked to adverse events, Demographic information like age was coded as a categorical variable as age below 20 and age above 20. Education included the categories: (a) No/incomplete primary education (b) primary education and incomplete (c) secondary and above. Employment was coded as a binary variable with a yes or no response. Alcohol use was assessed using 10 questions of the validated tool WHO Alcohol Use Disorder Identification Test (Babor et al., 2001). A total score of 40 was expected whereby 0 indicates a non-alcohol user, 1 to 7 as low-risk alcohol consumption, 8 to 14 as harmful alcohol consumption and of 15 and above alcohol dependence. Current tobacco uses and substance use was assessed using questions from the Tanzania Demographic and Health Survey of 2015 (Ministry of Health and Social Welfare et al., 2016), and a single variable for tobacco and substance use was created from a "yes" response to the questions assessing either of the two. We also included single questions on pornography use, gambling and those of adverse events experience, a peer victimization scale (Han et al., 2016) and a cyberbullying victimization scale (Patchin & Hinduja, 2015). A "yes" response to the questions on those variables was used to the experience of adverse events.

Data Analysis

Data analysis was conducted using STATA version 17.0 (StataCorp, TX, USA). Analysis was restricted to young men who self-identified as being currently in an intimate relationship or had been in an intimate relationship in the past twelve months ($n=828$). Descriptive analysis was conducted to determine the frequency and percentages of participants in each level of the categorical variables used to report demographic characteristics. We defined two mental health outcomes, symptoms of depression and suicidal thoughts, coded as described above. Bivariate and multivariable logistic regression models were employed to determine the association between each outcome with IPV perpetration and other psychosocial factors. We adjusted for clustering effect at street level in both the bivariate and multivariable models by using robust standard error that allows intergroup correlation.

In the bivariate models we included the potential confounders such as age, food insecurity, alcohol use, tobacco and substance use, pornography and gambling that were supported by literature for depression and social thoughts. A p-value less than 0.05 was considered to identify independent variables from the bivariate analysis to be included into multivariable models to adjust for confounding. Because of collinearity between IPV variables, seven different multivariable models were fitted for each form of IPV perpetration and each outcome in the multivariable models. A p-value of less than 0.05 was considered statistically significant. Odds ratios with their corresponding 95% confidence interval were used to summarize the association between mental health outcomes and the explanatory factors.

Table 2 Background characteristics of the study participants ($N=828$)

Demographic Characteristics	$N=828$	(%)
Districts		
Ilemela	369	44.6
Nyamagana	459	55.5
Adverse childhood experience		
Yes	818	98.8
No	10	1.2
Age group		
18–20	339	40.9
21–24	489	59.1
Level of Education		
No/Incomplete primary education	96	11.6
Primary education and incomplete secondary	315	38.0
Secondary and above	415	50.4
Employment Status (in the past 12 months)		
Employed	606	73.2
Not employed	222	26.8
Behavioural Characteristics		
Alcohol consumption		
Low-risk consumers	102	12.3
Harmful consumers	66	8.0
Dependent consumers	27	3.3
None consumers	633	76.4
Current tobacco/Substance Use		
Yes	157	6.9
No	771	93.1
Watch Pornography		
Yes	432	52.2
No	396	47.8
Gambling		
Yes	187	22.6
No	641	77.4
Food Insecurity		
Yes	455	54.9
No	373	45.1

Ethical Considerations

The Tanzanian National Health Research Ethics Committee approved the study (reference: NIMR/HQ/R.8a/Vol. IX/2991). Approval was also obtained from the ethics committee of the medical faculty of the Ludwig-Maximilians-University, Germany (reference: 21–0508) and the London School of Hygiene and Tropic Medicine, United Kingdom (reference: 16,121). All study participants provided informed consent after receiving information about the study objectives and procedures. Specially trained male interviewers conducted the interviews in private locations in the streets where the respondents lived. Referral information was prepared and provided to all the participants at the end of the interviews, yet none of the men wanted to be referred. The study has been funded by the ERC Starting Grant IPV_Tanzania (Grant number: 716458)

Results

In Table 2, we present the background characteristics of the study participants included in this analysis. Their median age was 21 years (Interquartile range: 19–23). Most participants (50.4%) had attained secondary education or above and 606 (73.2%) were employed during the past 12 months as skilled or unskilled laborer's. The majority reported having experienced an adverse event in their childhood, which includes physical punishment by their parents (98.8%). A total of 157 (6.9%) respondents used tobacco or other substances, and 23.6% consumed alcohol in the last year. More than half (52.2%) reported watching pornography, 187 (22.6%) reported being involved in gambling activities and 455 (54.9%) were categorized as having food insecurity.

In total, 262 (31.6%) young men reported mild symptoms of depression, 71(8.6%) reported moderately severe or severe depressive symptoms, and 93 (11.2%) reported suicidal thoughts in the last two weeks. Perpetration of the different forms of IPV in the past 12 months was 75.9% for controlling behaviours, 46.6% for emotional IPV, 31.3% for economic IPV, 24.3% for sexual IPV and 17.6% for physical IPV. The prevalence of perpetration of combined physical and/or sexual IPV was 32.5%.

The prevalence of depressive symptoms was generally higher among young men who reported perpetrating IPV. It ranged from 43.5% among those perpetrating controlling behaviours to 59.3% among those perpetrating sexual IPV. The prevalence of suicidal thoughts was also higher among those who perpetrated sexual IPV, physical and/or sexual IPV, and emotional IPV (see Table 3 for further details).

In the unadjusted models, depressive symptoms were significantly associated with perpetration of all forms of

Table 3 Bivariate association of depression and suicidal thoughts with IPV perpetration and other psychosocial factors $N=828$

Independent Variables	N	Depression	Crude Estimates		Suicidal Thoughts	Crude Estimates	
		$N=333$ %	OR (95%CI)	P-Value	$N=93$ %	OR (95%CI)	P-Value
Any form of IPV							
No	175	26.9	1		8.0	1	
Yes	653	43.8	2.12 (1.52, 2.96)	< 0.001	12.1	1.58(0.86, 2.90)	0.137
Physical IPV							
No	704	38.8	1		11.4	1	
Yes	124	48.4	1.48(0.89, 2.46)	0.131	10.5	0.91(0.50, 1.68)	0.771
Sexual IPV							
No	651	35.0	1		9.8	1	
Yes	177	59.3	2.71(1.97, 3.72)	< 0.001	16.4	1.80(1.15, 2.82)	0.011
Physical&/Sexual IPV							
No	585	34.4	1		9.6		
Perpetrators	243	54.3	2.27(1.56, 3.30)	< 0.001	15.2	1.70(1.12, 2.57)	0.013
Emotional IPV							
No	470	32.6	1		9.2	1	
Yes	358	50.3	2.10 (1.61, 2.73)	< 0.001	14.0	1.61(1.12, 2.32)	0.010
Economic IPV							
No	595	37.1	1		10.8	1	
Yes	233	48.1	1.57 (1.27, 2.28)	< 0.001	12.5	1.18(0.72, 1.92)	0.508
Controlling behaviours							
No	224	31.25	1		10.7	1	
Yes	604	43.54	1.7 (1.27, 2.28)	< 0.001	11.4	1.07(0.75, 1.53)	0.690
Age							
21–24	339	38.4	1		11.8	1	
18–20	489	41.5	1.14(0.84, 1.55)	0.394	10.8	0.91(0.63, 1.32)	0.613
Education level							
No/Incomplete primary education	96	49.0	1		15.6	1	
Primary education & incomplete secondary	315	40.0	0.70(0.43, 1.12)	0.132	10.5	0.63(0.31, 1.29)	0.209
Secondary & above	417	38.4	0.65 (0.40, 1.06)	0.084	10.8	0.65(0.35, 1.21)	0.175
Employment status							
No	222	35.1	1.00		9.5	1.00	
Yes	606	42.1	1.34 (0.97, 1.86)	0.078	11.9	1.29(0.91, 1.83)	0.150
Food Insecurity							
No	373	26.3	1		7.2	1	
Yes	455	51.7	3.00 (2.19, 4.10)	< 0.001	14.5	2.17(1.44, 3.29)	< 0.001
Alcohol Use							
None consumers	633	36.8	1		9.6	1	
Low-risk consumers	102	44.1	1.36 (0.87, 2.12)	0.181	10.8	1.13(0.60, 2.14)	0.700
Harmful consumers	66	56.1	2.19 (1.25, 3.84)	0.006	21.2	2.52(1.14, 5.58)	0.022
Dependent consumers	27	66.7	3.43 (1.30, 9.05)	0.013	25.9	3.28(1.55, 6.96)	0.002
Tobacco& Substance Use							
No	771	39.0	1		11.0	1	
Yes	57	56.15	2.00 (1.29, 3.10)	0.002	14.0	1.32(0.67, 2.49)	0.397
Pornography							
No	396	45.5	1		13.1	1	
Yes	432	35.4	0.66(0.49, 0.88)	0.005	9.5	0.69(0.40, 1.22)	0.202
Gambling							
No	641	37.1	1		8.9	1	
Yes	187	50.8	1.75 (1.23, 2.49)	0.002	19.3	2.44(1.55, 3.84)	< 0.001

IPV with the exception of physical IPV. Other factors associated with higher odds of having depressive symptoms were food insecurity, harmful and dependent alcohol use, tobacco and substance use and gambling. The unadjusted models also showed that young men perpetrating sexual IPV and emotional IPV had higher odds of reporting suicidal thoughts, than men reporting harmful and dependent alcohol use, those involved in gambling and by those with food insecurities (displayed in Table 2). Childhood adverse events were omitted due to its nearly universal prevalence and hance lack of a control group.

In Table 4, we present the associations between IPV perpetration and depression and suicidal thoughts after adjusting for age, food insecurity, alcohol use, tobacco and substance use, pornography and gambling. Perpetration of sexual IPV (aOR = 2.19, 95%CI = 1.57, 3.04), emotional IPV (aOR = 1.76, 95%CI = 1.26, 2.46), controlling behaviours (aOR = 1.46 95%CI = 1.10, 1.93) and economic violence (aOR = 1.32 95%CI = 1.01, 1.74) remained significantly associated with depression in this analysis. However, perpetration of IPV was not significantly associated with suicidal thoughts.

Discussion

This study of young men in Mwanza, Tanzania found significant associations between depressive symptoms and men's perpetration of most forms of IPV even after adjusting for other factors, indicating that this is a major problem in this population. However, suicidal thoughts were not associated with any form of IPV perpetration.

The prevalence of depressive symptoms among young men in Mwanza in this study was higher than that of a study among a similar population in an urban settlement (22%) in Dar es Salaam, Tanzania (Hill et al., 2020). One plausible explanation for the difference is that men in Mwanza endorse more traditional masculine norms than men in Dar-es-Salaam where early urbanization and population mixing of people from different cultural backgrounds and non-Tanzania residents might have had an effect (Mshana et al., 2021, 2022; Wight et al., 2005).

Our findings are consistent with results from other studies that have investigated the relationship between depression and IPV perpetration among men in the African context (Machisa & Shamu, 2018; Stark et al., 2020). For instance, a Zimbabwean national survey among men in the general population revealed a high prevalence of depression that was strongly associated with a higher lifetime perpetration of IPV (Machisa & Shamu, 2018).

Table 4 Multivariable association of depression and suicidal thoughts with IPV perpetration and other psychosocial factors $N = 828$

Variables	*N*	Depression[a] *N* = 333(%)	Adjusted Estimates		Suicidal Thoughts[b] *N* = 93(%)	Adjusted Estimates	
			aOR (95%CI)	*P*-Value		aOR (95%CI)	*P*-Value
Any form of IPV							
No	175	47 (26.9)	1		14 (8.00)	1	
Yes	653	286 (43.8)	1.75 (1.30, 2.35)	< 0.000	79 (12.1)	1.23 (0.63, 2.40)	0.539
Physical IPV							
No	704	273 (38.8)	1		80 (11.4)	1	
Yes	124	60 (48.4)	1.27(0.75, 2.13)	0.372	13 (10.5)	0.70 (0.39, 1.27)	0.24
Sexual IPV							
No	651	228 (35.0)	1		64 (9.8)	1	
Yes	177	105 (59.3)	2.19 (1.57, 3.04)	< 0.000	29 (16.4)	1.29 (0.79, 2.11)	0.302
Physical&/Sexual IPV							
No	585	201 (34.4)	1		56 (9.6)		
Yes	343	132 (54.3)	1.88 (1.29, 2.75)	< 0.000	37 (15.2)	1.28 (0.83, 1.98)	0.302
Emotional IPV							
No	407	153(32.6)	1		43 (9.2)	1	
Yes	358	180(50.3)	1.76 (1.26, 2.46)	0.001	50 (14.0)	1.29 (0.88, 1.88)	0.187
Economic IPV							
No	595	221 (37.1)	1		64 (10.8)	1	
Yes	233	112 (48.1)	1.32 (1.01, 1.74)	0.043	29 (12.5)	0.93 (0.57, 1.52)	0.775
Controlling behaviours							
No	224	70 (31.25)	1		24 (10.7)	1	
Yes	604	263 (43.54)	1.46 (1.10, 1.93)	0.008	69 (11.4)	0.89 (0.63, 1.27)	0.533

[a] Depression outcome: In these models, we adjusted for age groups, food insecurity, alcohol use, tobacco and substance use, pornography and gambling

[b] Suicidal thoughts outcome: In these models, we adjusted for age groups, food insecurity, alcohol use and gambling

A systematic review and meta-analysis of mental disorder and IPV perpetration in high income countries also reported a high risk of IPV perpetration among men with depression and other common mental disorders like anxiety (Oram et al., 2014). In addition, a study using Swedish national wide registries found that men suffering from depression to be at high risk of perpetrating IPV against their female partners even after controlling for factors shared by siblings like genetics and early family environment (Yu et al., 2019).

Notably, while there is evidence suggesting physical IPV perpetration to be strongly associated with depression (Saunders et al., 2021) and suicidal thoughts (Wolford-Clevenger et al., 2017) among male perpetrators, findings in this study show that sexual IPV was the most significant type of IPV perpetration associated with high odds of depressive symptoms among young male perpetrators of IPV. In typical patriarchal societies like Mwanza, norms of masculinity that regard sex as a man's right and a woman as a sex object intensify sexual IPV towards women (Wight et al., 2005). Multiple partnerships and sex are used to prove men's dominance and manhood in these societies. With young men, the struggle towards being dominant, proving their manhood and fitting in a context can make it even worse. In addition, evidence shows that IPV perpetration can leave men with a feeling of guilt and worthlessness (Machisa & Shamu, 2018) that are highly related to depression and risks for suicidal thoughts, attempts and actual suicide.

These findings therefore suggest the necessity of developing strategic interventions that can address depression and IPV perpetration among young men. Currently this relationship has not received sufficient attention, especially in sub-Saharan Africa (Machisa & Shamu, 2018; Saunders et al., 2021; Stark et al., 2020). There has been an increase of IPV prevention interventions that involve and work with males in addressing different risk factors and issues related to IPV perpetration, both in Tanzania and globally. However, we note that the mental health burden of problems like depression caused by IPV perpetration have rarely been given enough weight in these interventions. This situation is even worse for young men considering depression problems are reported to be recurring if not addressed (Gustavson et al., 2018), hence increasing the risk of IPV perpetration, years lived with disability and other related comorbidities related to depression.

Interventions to create awareness on depression problems should be designed to reach a wide range of young men in the communities. They can be incorporated in the IPV prevention curriculums, in schools and designed to reach men in different informal social groups in Tanzania and other similar settings like those made of farmers, taxi drivers, commercial motorcycle drivers and others. As part of health promotion these interventions should address stigma related to depression and other mental health problems in men and toxic masculine norms.

While suicidal thoughts were associated with sexual and emotional IPV perpetration and controlling behaviours in the bivariate analysis, the relationship disappeared in the multivariable analysis. This is in contrast to other studies conducted in Africa and other parts of the world (Wolford-Clevenger et al., 2017). However, with evidence showing high suicide rates of 13.5 per 100,000 people among men in Tanzania (WHO, 2021), it is important to further explore this association using large rigorously designed studies.

In this study, 98.8% of our study participants reported having experienced an adverse event in their childhood as these measures included corporal punishment used by parents, guardians and teachers that is considered child maltreatment globally. In Tanzania, corporal punishment is a widespread lawful disciplinary measure in homes, alternative care settings and schools (UNICEF, 2023). Given the near universal reporting of experiences of physical punishment, this factor could not be considered further in this analysis. This is very concerning as the association between adverse childhood experiences and depression in young adulthood has been highlighted in different literature in both high- and low-income countries (Kim et al., 2022; Al Shawi et al.,2019; Rehan et al.,2017; Satinsky et al., 2021). We urge policymakers and children's rights activists to amend this law that might lead to prolonged mental adversity that includes depression in adulthood. Moreover, findings from the UN multi-country study on men and violence from low and middle-income countries document experiences of emotional abuse and neglect in childhood as important risk factors for men's perpetration of sexual and physical IPV (Fulu et al.,2017). In Africa and Tanzania particularly, different studies highlight adverse childhood experiences as a risk factor for men's perpetration of IPV (Machisa et al.2016, McNaughton et al.2022). Adverse childhood experiences being a vital risk factor for both depression and IPV advocates for well-designed hybrid interventions that incorporate it and address both depression and IPV.

Consistent with other studies, the majority of men in this study reported food insecurity, which was significantly associated with both depression and suicidal thoughts. The high prevalence of food insecurity may be explained by the fact that most of the participants were involved in informal jobs that are known to be insecure and associated with low wages. Inability to satisfy food needs contributes to a lack of self-worth and malnutrition (Pak et al., 2020), both of which impact mental health and may increase odds of depression,

suicidal thoughts and IPV perpetration as a poor coping mechanism (Meyer et al., 2023; Hatcher et al., 2023).

Moreover, the association of gambling with suicidal thoughts compounds the problem. Gambling may not only lead to suicidality, but also to depression, anxiety and drug abuse (Uwiduhaye et al., 2021). Furthermore, these mental problems may lead to IPV perpetration especially when these men lose money supposed to be spent on family expenditures on gambling (Brambilla et al., 2023). Depression was not associated with alcohol use and substance use in the multivariable analysis despite strong evidence from other studies reporting their association (Boden & Fergusson, 2011; Yu et al., 2019). This may be explained by the overall low reporting of alcohol, tobacco and/or substance use among the participants, (19.6% and 6.0% respectively). The low prevalence of alcohol use may be due to sociocultural preferences, and the effect of different interventions implemented in the country such as the ban on the import, manufacturing, sale and consumption of the alcohol sachets, limiting the availability of cheap alcohol (Shubina et al., 2023).

Implications for Research and Practice

Our findings support the ecological framework of mental health. We confirm the association between depression, IPV perpetration and other social factors such as food insecurity, gambling and unemployment, hence recommend practitioners and researchers to continue developing a comprehensive ecological framework for explaining and addressing depression.

We recommend that mental health providers screen for IPV perpetration among young men reported with depressive symptoms. Involving their partners in the treatment process may yield even better results in addressing depression and IPV perpetration. Despite efforts made by the Tanzanian government to address mental health issues including depression, the country is still be lagging behind on offering tailored mental health services as it still only has a few experts (MoHCDEC, 2021). We recommend the identification and provision of inexpensive mental health interventions such as workshops that are tailored to the Tanzania cultural context to promote good mental health and address stigma-related problems. With a higher number of young adults in Tanzania using smartphones and the internet (TCRA, 2023), we suggest adopting digital technology for treating and preventing mental health disorders such as depression (Naslund et al., 2017). This can be done through the provision of subsidized smartphone-based behavioural therapy and family or relationship counselling for wide accessibility and affordability among young adults in Tanzania. IPV-related topics and other depression associated factors can also be incorporated into these smartphone-based interventions.

Limitations and Strength

To the best of our knowledge, this is the first study to examine the relationship between depression and suicidal thoughts and IPV perpetration among young men in Tanzania. Limitations of this study include its cross-sectional nature that does not allow examination of temporal sequence between exposure and outcomes, and the fact that depression and suicidal thoughts were not clinically diagnosed. Another limitation is the lack of generalizability of the study's findings to other settings. Also, the focus of the initial study was men's IPV perpetration. A focused study exploring men's depressive symptoms and suicidal ideation would have allowed us to use more detailed measurements of suicidal thoughts for young adults in non-clinical population (Fitriana et al., 2022). The study would have further benefitted from an exploration of men's experiences of IPV as these are often closely linked to men's perpetration of IPV. In addition, while the study has used available measurement tool for the perpetration of IPV, there is a concerning difference in the type of questions asked to assess IPV perpetration, especially economic abuse, that warrants further exploration in future studies.

Conclusions and Recommendations

Our findings suggest a high depression burden among young male in Mwanza, Tanzania that is associated with IPV perpetration. This calls for more studies especially those using a longitudinal designs and qualitative techniques to further explore the pathways between depression and IPV and vice versa. With the growing depression burden among men, there is an urgent need to develop and test interventions that can address both IPV and depression related health problems to reduce the risk of adverse impacts associated with both.

Funding Open Access funding enabled and organized by Projekt DEAL.

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