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ORIGINAL RESEARCH

Symptoms of depression, anxiety, and somatization in female victims and perpetrators of intimate partner violence in Maputo City, Mozambique

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Background: Little knowledge exists in Mozambique and sub-Saharan Africa about the mental health (symptoms of depression, anxiety, and somatization) of women victims and perpetrators of intimate partner violence (IPV) by type of abuse (psychological aggression, physical assault without/with injury, and sexual coercion). This study scrutinizes factors associated with mental health among women victims and perpetrators of IPV over the 12 months prior to the study.

Methods and materials: Mental health data were analyzed with bivariate and multiple regression methods for 1442 women aged 15–49 years who contacted Forensic Services at Maputo Central Hospital (Maputo City, Mozambique) for IPV victimization between April 1, 2007 and March 31, 2008.

Results: In bivariate analyses, victims and perpetrators of IPVs scored higher on symptoms of mental health than their unaffected counterparts. Multiple regressions revealed that controlling behaviors, mental health comorbidity, social support, smoking, childhood abuse, sleep difficulties, age, and lack of education were more important in explaining symptoms of mental health than demographics/socioeconomics or life-style factors. Victimization and perpetration across all types of IPV were not associated with symptoms of mental health.

Conclusion: In our sample, victimization and perpetration were not important factors in explaining mental ill health, contrary to previous findings. More research into the relationship between women's IPV victimization and perpetration and mental health is warranted as well as the influence of controlling behaviors on mental health.

Keywords: women, depression, anxiety, somatization, victims, perpetrators, controlling behaviors, child abuse, social support

Introduction

Intimate partner violence (IPV) toward women has received increased global attention for its serious violation of women's health, legal rights, and quality of life.[1] The prevalence and magnitude of IPV makes it a public health problem and an important cause of morbidity and mortality,[2] with physical,[2,3] sexual,[4,5] and mental health consequences.[6–10] Most studies investigating the mental health effects of IPV against women have focused predominantly on physical assault with or without injury and sexual coercion; however, the effect of psychological aggression on mental health within violent relationships may not have been sufficiently investigated.[6,8,9,11–14] Existing studies show adverse effects of IPV on women's health, such as chronic pain,[2,11,15] chronic stress-related symptoms, such as high blood pressure, abdominal pain, loss of appetite,[16] and central nervous system problems, such as headaches, fainting, back pain, and seizures.[2,11]

Several studies have also suggested a relationship between psychological aggression and poor mental health effects, such as depression and anxiety.[6,8,9,11,13,17–20] However, the frequent co-occurrence of psychological aggression with physical violence, as well as measurement difficulties, combine to reduce certainty regarding the independent effects of psychological aggression on mental health.[21] Although knowledge about the comparative mental health effects of IPV by type is limited, some studies have indicated that psychological aggression may be more strongly linked to depression, anxiety, somatization, and post-traumatic stress disorder (PTSD)[6,11,18–20,22] than other types of IPV.

Most studies reporting poor mental health among victimized women derive from high-income countries, and this relation may not be generalizable to low income countries, particularly in sub-Saharan Africa (SSA). Evidence from Botswana, Ethiopia, Ghana, Namibia, South Africa, and Tanzania points to a positive relation between IPV victimization and poor mental health, eg, depression.[12,13,23–27]

Traditionally, women have been considered the predominant victims of IPV and men the perpetrators of IPV; however, the picture may be more complex than previously thought, as indicated by increasing evidence reporting women as perpetrators of violence,[28–30] particularly in response to prior abuse, and often with high prevalence rates. Although most studies of women as perpetrators of IPV have focused mainly on physical assault, it is not uncommon for women to employ other forms of abuse against men, eg, psychological aggression.[31–34] However, not much research attention has been given to the relation between women's IPV perpetration and their own health status. Existing studies, which are mainly from Western countries, have revealed that female perpetrators of IPV can have mental health problems, such as depression and anxiety.[18,24,26,35–38] As far as we know, only one study has addressed the comparative effects of women's use of various IPV types on their own mental health, with results showing that psychological aggression was more strongly associated with depression, anxiety, and somatization than with other IPV types, eg, physical assault.[18]

Studies addressing the mental health of female victims and perpetrators of IPV are frequently limited to demographic/socioeconomic and life-style factors, particularly among perpetrators, whereas the effects of important factors, such as controlling behaviors, are not often considered. Omission of what has been shown to be a potentially crucial factor in explaining mental health consequences could skew the relationship between IPV and mental health consequences towards confirmation. Controlling behaviors have been associated with women as victims[40,41] and perpetrators of IPV,[24,26,32,34,42–44] as well as with poor mental health (eg, depression) among female victims and perpetrators of IPV.[18,24,26,45] The effect of controlling behavior on mental health is reported to be more salient than the effect of victimization.[45]

Therefore, the aim of this study was to investigate the association between women as victims and perpetrators of IPV in relation to mental health consequences (depression, anxiety, and somatization) and associated factors in order to provide a better understanding of mental health in women victims and perpetrators of IPV and its management in Mozambique and similar contexts.

Methods and materials
Setting
Cross-sectional data gathered during the 12 months between April 1, 2007 and March 31, 2008 (consecutive cases) among women visiting the Forensic Services[1] unit at Maputo Central Hospital for abuse by a partner were used for this study. The interviews were conducted by selected trained females: four medical students from the Faculty of Medicine, and two nurses from Forensic Services. These interviewers were informed in detail about the research and various facets of IPV. They were also thoroughly informed about each and every scale included in the questionnaire, and they were trained to use it. Upon their arrival at the Forensic Services unit, the participant women were approached by the interviewers and carefully informed about all aspects of the study and the extent of their participation. Voluntariness and confidentiality were strongly emphasized. The participants were also informed that refusal to participate would not result in any negative consequences. If the women agreed to participate, consent was obtained (verbally and/or in writing). All the participants provided verbal consent prior to the commencement of the interviews, which were on average 1 hour and conducted in an isolated room by means of a questionnaire. Inclusion criteria included: (a) age 15–49 years; (b) victims of IPV; (c) acceptance to participate; and (d) resident in Maputo city, Mozambique. Data processing and preservation followed the usual anonymous and confidentiality rules, rendering public only results from aggregated data. The results (aggregate data) were available for participants upon request.

Participants

A total of 1500 women aged 15–49 years who had been exposed to abuse by a partner were approached. Of this number, 1442 women agreed to participate in the study (response rate of 96.1%), and 58 declined. Responses to the questions about violence were received from 1429 to 1433 participants depending on the type of violence. These women were referred by female nongovernmental organizations or the police, or they were self-referred.

Measures

Outcome

Mental health was assessed with the Symptom Check List-Revised (SCL-90-R),[46] which consists of 90 items divided into nine symptom dimensions. This study used dimensions of symptoms of depression, anxiety, and somatization. Depression was assessed using 13 items covering areas such as thoughts of suicide and loss of vital energy. Anxiety was assessed using 10 items that reflect feelings such as nervousness and fear. Somatization was assessed using 12 items covering areas such as cardiovascular and gastrointestinal complaints. The item scores ranged from 0 to 4 (not at all, to very much). The scores ranged from 0–52 for symptoms of depression, 0–40 for anxiety, and 0–48 for somatization, with high scores corresponding to high symptom reporting. Among women as victims, the Cronbach's α were 0.83 for symptoms of depression, 0.81 for anxiety, and 0.82 for somatization. The corresponding Cronbach's α among women as perpetrators were 0.83, 0.81, and 0.83, respectively.

Exposure

Intimate partner violence (IPV) was measured with the Conflict Tactic Scales-Version 2 (CTS2),[47] consisting of 39 items, aimed at respondents both as victims and as perpetrators (a total of 78 items). The CTS2 contains questions assessing the following: cognitive (eg, I suggested a compromise to a disagreement) and emotional (eg, I showed my partner I cared even though we disagreed)-oriented negotiation; minor (eg, insulted or swore at my partner) and severe (eg, called my partner fat or ugly) psychological aggression; minor (eg, pushed or shoved my partner) and severe (eg, beat up my partner) physical assault; minor (eg, made my partner have sex without a condom) and severe sexual coercion (eg, used threats to make my partner have sex); minor (eg, had a sprain) and severe (eg, had a broken bone from a fight with my partner) physical assault with injury; as well as chronicity of abusive acts (how often the acts happened),

which may have occurred once, twice, 3–5, 6–10, 11–20, or >20 times during the past year or did not occur in the past year but occurred before or never happened.[a] The CTS2 is a previously validated and reliable instrument.[47] Cronbach's α among women victims was 0.89 for physical assault, 0.82 for psychological aggression, 0.73 for sexual coercion, and 0.65 for physical assault with injury. The correspondent Cronbach's α among women perpetrators were 0.79, 0.73, 0.70, and 0.63, respectively.

Abuse in childhood was measured with four items, one each for psychological abuse (eg, shouted or yelled at); physical abuse (eg, beaten up); sexual abuse (eg, forced to have sex); injury (eg, bruised); and chronicity (how often the acts happened). The acts may have happened once, twice, 3–5, 6–10, 11–20 or >20 times or never happened.[b] The items obtained data about the respondent's exposure to abuse before 15 years of age. Cronbach's α was 0.72 for physical abuse, 0.70 for psychological abuse, 0.68 for sexual abuse, and 0.71 for injury.

Controlling behaviors were measured with the Controlling Behaviors Scale – Revised (CBS-R), consisting of 24 items[43,44] that do not include items of physical assault. The CBS-R has good discriminative ability and can be scored to derive five subscores, each representing a particular type of control tactic or a total controlling behavior score (eg, "try to restrict time individual spent with family or friends"). The response format ranges from 0 to 4 (never to always), with a total range of 0–96. The women reported how often their partner used each act of controlling behavior toward them, as well as how often they used each act of controlling behavior toward their partner in the past year. This study used the total controlling behavior, and high scores corresponded to high controlling behaviors. Cronbach's α was 0.91 for women using control and 0.93 for women being controlled.

Social support was measured with the 12-item Schedule for Social Interaction.[48] Six items assessed "social attachment" (availability of deep emotional relationships) and the other six items assessed "social integration" (availability of peripheral social networks). Item scores ranged from 1 to 6 (ie, not available to available), with social attachment scores ranging from 0 to 6, social integration ranging from

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[a]The CTS2 are scored by adding the midpoints of the response categories. For the categories 0, 1 and 2 the midpoints are the same. For category 3 (3–5 times) the midpoint is 4; for category 4 (6–10 times) the midpoint is 8; for category 5 (11–20 times) the midpoint is 15; and for category 6 (>20 times) the midpoint is 25.

[b]The scaling was based on CTS2. See also footnote a.

6 to 36, and social interaction (total) ranging from 6 to 42. High scores (components, total) corresponded to high social support. For this study, social attachment and social integration were used. Cronbach's α for social attachment among women as victims and perpetrators were 0.75 and 0.80, respectively, and corresponding Cronbach's α for social integration were 0.87 and 0.88, respectively.

Use of alcohol/cigarettes and sleep difficulties were assessed as dichotomous yes/no variables. Body mass index (BMI) was based on self-reported height and weight and calculated for each woman with the formula, kg/m². Finally, demographic and socioeconomic characteristics were assessed with a classification system used in Mozambique (Ministry Council–Ministry of Finance), and included the following: age (in years), marital status (categorized as single, married/cohabitant, divorced/separated, and widow), children at home (assessed as yes or no variable), housing (categorized as conventional, and nonconventional), education (assessed as no education, low, intermediate, and high), occupational status (assessed as blue collar-worker, low white-collar-worker, middle-high white collar-worker and student/other), socioeconomic status (assessed as work for other, liberal/own business, student and domestic/other), salary/financial resources (categorized yes or no), and financial strain, which reflected how respondents make ends meet, was assessed as "no," "sometimes," "often," and "always" format. A woman was regarded as experiencing financial strain if her response was anything but "no."

Statistical analyses

Cross-tabulations/means and standard deviations (SD), and Pearson's chi-square analyses were used to assess the demographic, socioeconomic, and lifestyle factors associated with the IPV types. The significance level was set at $P < 0.05$. Using analysis of variance, descriptive statistics of mental health scores (symptoms of depression, anxiety, and somatization) were examined among women who were victims of IPV types compared with those who were not victims of IPV, as well as women who were perpetrators of IPV types (psychological aggression, physical assault without/with injury, sexual coercion) compared with those who were not perpetrators of IPV during the past 12 months.

Multiple linear regression analyses were conducted to examine the explanatory factors in the association between women's IPV victimization and perpetration during the past 12 months independent of type and the outcome variables (symptoms of depression, anxiety, and somatization). The selected factors (exposures) were variables significantly

associated with the IPV types in bivariate analyses conducted in a previous study.[49] These included married/ cohabitant, secondary education, blue-collar worker and middle/high white-collar (occupational status), work for others (socioeconomic status), salary/financial resources, financial strain, children at home, living in nonconventional housing, BMI, use of cigarettes and alcohol, abuse as a child, and controlling behaviors (controlling behaviors over/ by partner). In addition, sleep difficulties, being a victim and a perpetrator of IPV across all types of abuse, as well as social support variables, were added. Finally, depending on the outcome being analyzed, depression, anxiety, or somatization were also used as exposure variables to assess for influence of comorbidity with other mental health consequences. For example, in the analysis of depression and associated factors, anxiety and somatization were added as exposure variables.[c] All variables were entered into the multiple linear regression models in a single block to control for possible confounding between these variables. Results were expressed as standardized betas and *P*-values. Significance levels for bivariate and multiple regression analyses were set at $P < 0.05$.

Ethical consideration

Ethical authorization was given by The National Ethical Committee at the Ministry of Health of Mozambique (122/ CNBS/06).

Results
Characteristics of the women by IPV types

Differences in demographic, socioeconomic, and lifestyle factors associated with IPV types are presented in Table 1.

Psychological aggression

Significantly higher proportions of women who reported psychological aggression were single (53%, n = 489; $P < 0.0001$), had intermediate educational level (56%, n = 51; $P < 0.001$), and did not use alcohol (60%, n = 558; $P = 0.018$). However, there were no significant associations between psychological aggression and age, children at home, housing, occupational status, socioeconomic status, salary/ financial resources, financial strain, BMI and smoking.

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[c]Omitting control, abuse as a child and the mental dimensions as exposure factors in the models did not affect the importance of victimization and perpetration across types (data not shown here). Replacing violence across types by each and every type did not change either the picture (data not shown here).

Table 1 Demographics, socioeconomics, and life-style characteristics of women

Characteristics	Psychological (n = 1433)		Physical (n = 1432)		Sexual (n = 1433)		Injury (n = 1432)	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Age (years)	P = 0.398		P = 0.120		P = 0.626		P < 0.0001	
Mean ± SD	28.7 ± 8.1	28.8 ± 8.7	28.7 ± 7.9	29.5 ± 8.8	28.6 ± 7.9	29.6 ± 8.7	29.6 ± 7.7	28.8 ± 8.7
Marital status	(n = 1405)	P < 0.0001	(n = 1404)	P < 0.0001	(n = 1405)	P < 0.0001	(n = 1404)	P < 0.0001
Single	489 (53)	251 (51)	388 (51)	352 (55)	390 (54)	350 (51)	209 (43)	531 (57)
Married/cohabitant	302 (33)	103 (21)	253 (34)	151 (23)	230 (32)	175 (25)	174 (36)	230 (25)
Divorced/separated	88 (10)	90 (18)	86 (11)	92 (14)	68 (10)	110 (16)	75 (16)	103 (11)
Widow	36 (4)	46 (10)	32 (4)	50 (8)	26 (4)	56 (8)	22 (5)	60 (7)
Children at home	(n = 1348)	P = 0.171	(n = 1347)	P = 0.501	(n = 1348)	P = 0.988	(n = 1347)	P = 0.252
Yes	649 (73)	352 (77)	554 (75)	446 (73)	513 (74)	488 (74)	397 (85)	603 (68)
No	239 (27)	108 (13)	185 (25)	162 (27)	178 (26)	169 (26)	71 (15)	276 (32)
Housing	(n = 1408)	P = 0.667	(n = 1407)	P = 0.897	(n = 1408)	P = 0.337	(n = 1407)	P = 0.01
Conventional[a]	787 (86)	411 (84)	650 (85)	547 (85)	615 (86)	583 (85)	398 (82)	799 (87)
Nonconventional[b]	134 (14)	76 (16)	116 (15)	94 (15)	104 (14)	106 (15)	89 (18)	121 (13)
Education	(n = 1433)	P = 0.001	(n = 1432)	P = 0.397	(n = 1433)	P = 0.090	(n = 1432)	P = 0.356
No[c]	45 (5)	46 (9)	43 (6)	48 (7)	37 (5)	54 (7)	34 (7)	57 (6)
Low[d]	236 (25)	148 (30)	206 (26)	178 (28)	185 (26)	199 (29)	145 (30)	239 (26)
Inter[e]	519 (56)	241 (49)	427 (55)	333 (51)	399 (55)	361 (52)	252 (51)	508 (54)
High[f]	131 (14)	57 (12)	98 (13)	89 (14)	105 (14)	83 (12)	59 (12)	128 (14)
Occupational status	(n = 1433)	P = 0.314	(n = 1432)	P = 0.744	(n = 1433)	P = 0.901	(n = 1432)	P < 0.0001
Blue-collar worker	504 (56)	294 (62)	440 (59)	358 (57)	403 (57)	395 (58)	300 (64)	498 (55)
Low white-collar worker	47 (5)	18 (4)	35 (5)	30 (5)	35 (5)	30 (4)	23 (5)	42 (5)
Middle/high white-collar worker	103 (11)	50 (10)	86 (12)	67 (10)	82 (12)	71 (11)	67 (14)	86 (9)
Student/other	249 (28)	116 (24)	187 (25)	177 (28)	182 (26)	183 (27)	78 (17)	286 (31)
Socioeconomic status	(n = 1417)	P = 0.114	(n = 1416)	P = 0.117	(n = 1417)	P = 0.111	(n = 1416)	P < 0.0001
Work for others[g]	320 (34)	145 (30)	277 (36)	188 (29)	264 (37)	201 (29)	197 (40)	268 (29)
Liberal/own business[h]	149 (16)	99 (20)	124 (16)	124 (20)	118 (16)	130 (19)	87 (18)	161 (17)
Student	251 (27)	115 (24)	190 (24)	175 (27)	184 (25)	182 (26)	80 (16)	285 (31)
Domestic/other[i]	210 (23)	128 (26)	183 (24)	155 (24)	159 (22)	179 (26)	126 (26)	212 (23)
Salary/financial resources	(n = 1386)	P = 0.655	(n = 1386)	P = 0.202	(n = 1386)	P = 0.063	(n = 1386)	P < 0.0001
Yes	424 (46)	213 (45)	362 (48)	275 (44)	344 (48)	293 (43)	256 (53)	381 (42)
No	490 (54)	259 (55)	400 (52)	349 (56)	376 (52)	382 (57)	224 (47)	525 (58)
Financial strain	(n = 1405)	P = 0.102	(n = 1404)	P = 0.812	(n = 1405)	P = 0.368	(n = 1404)	P = 0.012
Yes	774 (84)	420 (87)	651 (85)	542 (85)	605 (84)	589 (86)	429 (88)	764 (83)
No	149 (16)	62 (13)	117 (15)	94 (15)	114 (16)	97 (14)	57 (12)	154 (17)
BMI (n)	(n = 1316)	P = 0.734	(n = 1315)	P = 0.120	(n = 1316)	P = 0.569	(n = 1315)	P = 0.185
Mean ± SD	25 ± 4.6	24.5 ± 4.8	25.1 ± 4.6	24.5 ± 4.8	24.9 ± 4.5	24.7 ± 4.9	25.4 ± 4.7	24.5 ± 4.7
Alcohol use	(n = 1412)	P = 0.018	(n = 1432)	P = 0.009	(n = 1433)	P < 0.001	(n = 1432)	P = 0.009
Yes	364 (40)	156 (31)	310 (41)	210 (33)	300 (42)	220 (32)	205 (42)	315 (34)
No	558 (60)	334 (69)	456 (59)	435 (67)	419 (58)	473 (68)	281 (58)	610 (66)
Cigarette use	(n = 1402)	P = 0.587	(n = 1401)	P = 0.066	(n = 1402)	P = 0.003	(n = 1398)	P < 0.0001
Yes	71 (7)	34 (9)	66 (8)	39 (6)	68 (9)	37 (5)	57 (12)	48 (5)
No	843 (93)	454 (91)	721 (92)	575 (94)	645 (91)	652 (95)	426 (88)	870 (95)

Notes: [a]Housing in cement; [b]Housing in local material, eg, mud, wood; [c]Cannot read/write; [d]Primary school/similar; [e]Secondary school/similar; [f]University/similar; [g]eg, clerks; [h]eg, accountants; [i]At home/unemployed.
Abbreviation: SD, standard deviation.

Physical assault

Among women who reported physical assault, a significantly higher proportion were single (51%, n = 388; P < 0.0001) and did not drink alcohol (59%, n = 456; P = 0.009). However, there were no significant associations between physical assault and age, children at home, housing, educational level, occupational status, socioeconomic status, salary/financial resources, financial strain, BMI, and smoking.

Sexual coercion

A significantly higher proportion of women who reported sexual coercion were single (54%, n = 390; P < 0.0001),

did not drink alcohol (58%, n = 419; $P < 0.0001$), and did not smoke cigarettes (91%, n = 645; $P = 0.003$). However, there were no significant associations between sexual coercion and age, children at home, housing, educational level, occupational status, socioeconomic status, salary/financial resources, financial strain and BMI.

Physical assault with injury

The number of women reporting physical assault with injury was significantly associated with age (Mean/SD = 29.6 ± 7.7; $P < 0.0001$) and included a higher proportion of women who were single (43%, n = 209; $P < 0.0001$), resident in conventional housing (82%, n = 398; $P < 0.01$), were blue collar workers (64%, n = 300; $P < 0.0001$), worked for others (40%, n = 197; $P < 0.0001$), received salary/financial resources (53%, n = 256; $P = 0.0001$), were experiencing financial strain (88%, n = 429; $P = 0.012$), did not drink (58%, n = 281; $P = 0.009$), and did not smoke (88%, n = 426; $P < 0.0001$). However, there were no significant associations among physical assault with injury and children at home, educational level, and BMI.

Descriptive statistics of mental health scores by IPV type for victims and perpetrators

Results of the descriptive statistics are presented in Table 2.

Victims

Compared to women who were not psychologically abused, women who were psychologically abused scored higher on symptoms of depression (F[1,1419] = 27.9; $P < 0.0001$), anxiety (F[1,1419] = 10.6; $P = 0.0012$) and somatization (F[1,1419] = 14.3; $P = 0.002$). Similarly, the following symptom scores were exhibited among women who were physically assaulted: depression (F[1,1419] = 54.8; $P < 0.0001$), anxiety (F[1,1419] = 24.6; $P < 0.0001$), and somatization (F[1,1419] = 23.1; $P < 0.0001$); women who experienced sexual coercion: depression (F[1,1419] = 21.3; $P = 0.0001$), anxiety (F[1,1420] = 18.5; $P < 0.0001$), and somatization (F[1,1419] = 15.7; $P = 0.0001$); and women who experienced physical assault with injury: depression (F[1,1419] = 45.5; $P < 0.0001$), anxiety (F[1,1419] = 27.1; $P < 0.0001$), and somatization (F[1,1419] = 26.6; $P < 0.0001$), compared to women who were not physically assaulted, did not experience sexual coercion, and did not experience physical assault with injury, respectively (Table 2).

Table 2 Mean/SD for SCL-90-R (symptoms of depression, anxiety, and somatization) among women victims and perpetrators of intimate partner violence by type (psychological aggression, physical assault, sexual coercion, and injury) within/above psychiatric outpatient norms (POPN)

Variables	Psychological (n = 1431)		Physical (n = 1429)		Sexual (n = 1431)		Injury (n = 1431)		POPN (n = 577)
	Yes^a n	No^b n	Yes^a n	No^b n	Yes^a n	No^b n	Yes^a n	No^b n	
Victims (n)	(1421)		(1421)		(1421)		(1421)		
Depression	930; $P < 0.0001$	491	773; $P < 0.0001$	648	725; $P < 0.0001$	696	489; $P < 0.0001$	932	
Mean (SD)	1.3 (0.875)	1.1 (0.900)	1.4 (0.847)	1.0 (0.909)	1.3 (0.889)	1.1 (0.878)	1.4 (0.878)	1.1 (0.879)	1.94 ± 0.93
Anxiety	930; $P = 0.0012$	491	773; $P = 0.0001$	648	725; $P < 0.0001$	696	489; $P < 0.0001$	932	
Mean (SD)	1.0 (0.877)	0.856 (0.898)	1.1 (0.879)	0.835 (0.893)	1.1 (0.897)	0.851 (0.864)	1.1 (0.896)	0.874 (0.870)	1.59 ± 0.90
Somatization	930; $P = 0.002$	491	773; $P = 0.0001$	648	725; $P = 0.0001$	696	489; $P < 0.0001$	932	
Mean (SD)	0.854 (0.688)	0.709 (0.691)	0.884 (0.681)	0.708 (0.694)	0.875 (0.689)	0.730 (0.686)	0.933 (0.694)	0.736 (0.682)	0.99 ± 0.78
Perpetrators (n)	(1421)		(1420)		(1421)		(1421)		
Depression	910; $P = 0.0269$	511	542; $P = 0.0028$	878	557; $P = 0.00816$	864	321; $P < 0.0001$	1100	
Mean (SD)	1.2 (0.894)	1.1 (0.936)	1.3 (0.872)	1.1 (0.928)	1.2 (0.875)	1.2 (0.933)	1.3 (0.799)	1.0 (0.824)	1.94 ± 0.93
Anxiety	910; $P = 0.0138$	511	542; $P < 0.0001$	878	557; $P = 0.0004$	864	321; $P < 0.0001$	1100	
Mean (SD)	1.0 (0.864)	0.880 (0.933)	1.1 (0.846)	0.879 (0.908)	1.1 (0.870)	0.890 (0.899)	1.3 (0.840)	0.868 (0.886)	1.59 ± 0.90
Somatization	910; $P = 0.0076$	511	542; $P = 0.0008$	878	557; $P = 0.0017$	864	321; $P < 0.0001$	1100	
Mean (SD)	0.837 (0.674)	0.734 (0.738)	0.879 (0.667)	0.751 (0.715)	0.859 (0.665)	0.768 (0.708)	0.909 (0.604)	0.740 (0.683)	0.99 ± 0.78

Notes: ^aSustained or inflicted; ^bNot sustained or not inflicted. **Abbreviation:** SD, standard deviation.

Perpetrators

Compared to women who did not perpetrate any IPV type, women who were perpetrators of psychological aggression scored higher on symptoms of depression (F[1,1419] = 4.9; $P = 0.0269$), anxiety (F[1,1419] = 6.1; $P = 0.0138$), and somatization (F[1,1419] = 7.1; $P = 0.0076$). Similar higher scores were observed among perpetrators of physical assault for symptoms of depression (F[1,1418] = 8.9; $P = 0.0028$), anxiety (F[1,1418] = 17.4; $P < 0.0001$), and somatization (F[1,1418] = 11.3; $P = 0.0008$), compared to women who did not perpetrate physical assault; among perpetrators of sexual coercion for symptoms of depression (F[1,1419] = 3.04; $P = 0.0081$), anxiety (F[1,1419] = 12.7; $P = 0.0004$), and somatization (F[1,1419] = 5.75; $P = 0.0017$), compared to women who did not perpetrate sexual coercion. Scores among women who perpetrated physical assault with injury were symptoms of depression (F[1,1419] = 44.0; $P < 0.0001$), anxiety (F[1,1419] = 51.1; $P < 0.0001$), and somatization (F[1,1419] = 32.1; $P < 0.0001$), compared to women who perpetrated physical assault (Table 2).

Multiple regression analyses of mental health

Results of the multiple linear regression analyses conducted to examine factors associated with the different outcome variables are presented in Table 3.

Symptoms of depression

There were significantly negative associations between symptoms of depression and being married/cohabitant ($\beta = -0.053$; $P = 0.016$), and social attachment ($\beta = -0.055$; $P = 0.011$). In contrast, symptoms of depression were positively associated with no education ($\beta = 0.047$; $P = 0.042$), controlling behaviors by partner ($\beta = 0.174$; $P < 0.0001$), sleep difficulties ($\beta = 0.067$; $P = 0.001$), as well as comorbidity with symptoms of anxiety ($\beta = 0.600$; $P < 0.0001$), and somatization ($\beta = 0.165$; $P < 0.0001$).

Symptoms of anxiety

The associations between symptoms of anxiety and smoking ($\beta = 0.051$; $P < 0.012$), control over partner ($\beta = 0.086$; $P < 0.0001$), and comorbidity with depression ($\beta = 0.619$; $P < 0.0001$), as well as somatization ($\beta = 0.276$; $P < 0.0001$) were positive and significant, whereas symptoms of anxiety were negatively associated with control by partner ($\beta = -0.102$; $P < 0.0001$), and social attachment ($\beta = -0.047$; $P = 0.030$).

Symptoms of somatization

Age ($\beta = 0.082$; $P = 0.004$), sleep difficulties ($\beta = 0.107$; $P < 0.0001$), control by partner ($\beta = 0.082$; $P = 0.005$), social attachment ($\beta = 0.056$; $P = 0.034$), social integration ($\beta = 0.058$; $P = 0.021$), and abuse as a child ($\beta = 0.097$; $P = < 0.0001$), as well as comorbidity with symptoms of depression ($\beta = 0.253$; $P < 0.0001$), and anxiety ($\beta = 0.409$; $P < 0.0001$) were significantly and positively associated with reporting symptoms of somatization (Table 3).

Discussion

Characteristics of the women by IPV types

This study examined the associations between IPV types during the past 12 months, the mental health consequences of IPV, and explanatory factors among women resident in Maputo City, Mozambique who visited the Forensic Services unit at Maputo Central Hospital to get legal assistance by completing a clinical forensic report. Consistent with previous studies,[50,51] our results indicated varying significant differences between exposure to IPV and several factors, such as age, marital status, housing, educational level, occupational and socioeconomic status, financial resources and financial strain, and alcohol and cigarette consumption. However, as shown in the multiple regressions analyses, the explanatory factors in our sample population were not important factors in elucidating symptoms of depression, anxiety and somatization, which is consistent with previous studies.[11,12,19,23]

Descriptive analyses of IPV by type and mental health

In general, women's IPV victimization and perpetration during the past 12 months were related to symptoms of depression, anxiety, and somatization. However, significant effects were more apparent in relation to being victimized by abuse than by perpetrating abuse. This is consistent with previous findings concerning IPV victimization,[7,8,17,23,24,26,36,52] as well as IPV perpetration.[35,37–39,53,54]

Among victims, symptoms of depression, anxiety, and somatization were somewhat less evident in conjunction with psychological aggression than with the other violence types (as indicated by the level of significance of the associations), which is not similar to findings in other studies.[11,18,19] Similarly, among perpetrators, symptoms of mental health consequences were somewhat more significantly associated with other types of IPV compared to psychological aggression, which is contrary to a recent study showing a stronger

Table 3 Factors associated with symptoms of depression, anxiety and somatization expressed as betas (β) and *P*-values among all women

Variables	Depression		Anxiety		Somatization	
	β	*P*-values	β	*P*-values	β	*P*-values
Age	−0.027	*P* = 0.249	−0.008	*P* = 0.727	0.082	*P* = 0.004
Marital status						
Single	l		l		l	
Married/cohabitant	−0.053	*P* = 0.016	−0.004	*P* = 0.847	0.023	*P* = 0.407
Divorced/separated	−0.037	*P* = 0.081	−0.036	*P* = 0.092	−0.005	*P* = 0.843
Widow	0.017	*P* = 0.404	0.002	*P* = 0.903	−0.020	*P* = 0.429
Children at home	0.041	*P* = 0.095	−0.019	*P* = 0.432	−0.003	*P* = 0.913
Housing						
Conventional	l		l		l	l
Nonconventional	0.008	*P* = 0.661	0.024	*P* = 0.195	−0.020	*P* = 0.390
Education level						
No	0.047	*P* = 0.042	−0.043	*P* = 0.070	0.037	*P* = 0.200
Low	0.019	*P* = 0.571	−0.042	*P* = 0.212	0.058	*P* = 0.151
Inter	−0.010	0.741	−0.022	*P* = 0.483	0.070	*P* = 0.063
High	l		l		l	
Occupational status						
Blue-collar worker	l		l		l	
Low white-collar worker	0.003	*P* = 0.895	−0.033	*P* = 0.105	0.037	*P* = 0.133
Middle/high white-collar worker	0.001	*P* = 0.976	0.024	*P* = 0.308	0.001	*P* = 0.965
Student/other	0.033	*P* = 0.819	−0.078	*P* = 0.597	−0.028	*P* = 0.857
Socioeconomic status						
Worker for others	l		l		l	
Liberal/own business	−0.019	*P* = 0.394	0.015	*P* = 0.527	0.050	*P* = 0.075
Student	−0.018	*P* = 0.904	0.063	*P* = 0.672	0.088	*P* = 0.627
Domestic/other	0.002	*P* = 0.944	0.001	*P* = 0.971	0.024	*P* = 0.521
Salary/financial resources	0.004	*P* = 0.896	−0.022	*P* = 0.434	0.013	*P* = 0.707
Financial strain	0.010	*P* = 0.609	−0.002	*P* = 0.931	−0.004	*P* = 0.862
BMI	0.027	*P* = 0.169	−0.031	*P* = 0.111	0.028	*P* = 0.248
Drinking	0.026	*P* = 0.170	−0.011	*P* = 0.576	0.005	*P* = 0.824
Smoking	−0.029	*P* = 0.141	0.051	*P* = 0.012	-0.031	*P* = 0.212
Sleep difficulties	0.067	*P* = 0.001	−0.006	*P* = 0.759	0.107	*P* < 0.0001
Depression	–	–	0.619	*P* < 0.0001	0.253	*P* < 0.0001
Anxiety	0.600	*P* < 0.0001	–	–	0.409	*P* < 0.0001
Somatization	0.165	*P* < 0.0001	0.276	*P* < 0.0001	–	–
Control by partner	0.174	*P* < 0.0001	−0.102	*P* < 0.0001	0.082	*P* = 0.005
Control over partner	−0.020	*P* = 0.414	0.086	*P* < 0.0001	−0.027	*P* = 0.371
Social attachment	−0.055	*P* = 0.011	−0.047	*P* = 0.030	0.056	*P* = 0.034
Social integration	−0.003	*P* = 0.887	0.001	*P* = 0.972	0.058	*P* = 0.021
Victimization	−0.032	*P* = 0.336	0.052	*P* = 0.126	−0.033	*P* = 0.430
Perpetration	0.028	*P* = 0.407	−0.065	*P* = 0.062	0.053	*P* = 0.210
Abuse as a child	0.010	*P* = 0.605	−0.025	*P* = 0.196	0.097	*P* < 0.0001

effect of psychological aggression on mental health than other forms of IPV.[18]

Multiple regression analyses of mental health

Victimization and perpetration during the past 12 months were not independently associated with symptoms of depression, anxiety, and somatization. Explanations may be

twofold: the first is methodological, in that the analysis was first based on women's self-report of these symptoms rather than on clinical evidence; the second is the possibility that other factors, such as controlling behaviors, may have been more crucial in explaining the mental health of the women in our study than the abusive acts were. As suggested elsewhere,[49] these women were involved in relationships within which the occurrence of mutual abuse (ie, being both abused

and abusing) was the norm rather than the exception. Thus, the effect of abuse on their mental health may not have been significantly "visible" because these women may have adapted to abuse as a "normal" part of their lives. It is also possible that mental health problems may have existed prior to the abuse (the past 12 months), and therefore did not have a major influence on them. Our findings therefore stress the need for more research using longitudinal study designs to investigate the relation between IPV victimization, perpetration, and mental health in the Sub-Saharan African (including Mozambique) context.

Controlling behaviors by partner was positively associated with symptoms of depression and somatization and might be attributed to the effects of men's controlling behaviors on women to instill fear and limit their independence and physical and social freedoms, which in turn might lead to feelings of hopelessness, reduced self-esteem, and psychopathology in the form of symptoms of depression and somatization. However, controlling behaviors by partner was also negatively associated with anxiety. The explanation for this result might be that women who have adapted to and accepted the social norms imposed by the patriarchal society in which they reside (characterized by tolerance of gender roles, economic dependency, and IPV) were less likely to exhibit symptoms of anxiety. Interestingly, women's controlling behaviors over their partner was also associated with anxiety, which may indicate fear of the partner's reactions or that the women were ashamed of their coercive behaviors. These findings therefore warrant further investigation. However, our findings are in agreement with those of recent studies, which indicate a relation between controlling behaviors and poor mental health,[18,24,26,45,55] and the effects of controlling behaviors upon mental health were more marked than those of victimization.[45]

The association of abuse as a child with symptoms of somatization is consistent with previous findings linking this abuse to poor mental health, including somatization.[15,26,56–58] Although the mechanisms explaining the link between childhood trauma and symptoms of somatization in adulthood remain unclear, psychoanalytic explanations remain outside the scope of this study. However, it is plausible that a two-way social learning process is involved; on the one hand, as children the women may have been punished for going against social norms and thereby learned to suppress emotional expression. On the other hand, the effects of abuse in adulthood may have resulted in remorse and positive attention from significant others (ie, the perpetrator). These women may then have acquired an increased awareness of,

and sensitivity to, bodily reactions and a distorted perception of, eg, the experienced emotional reactions.

Sleep difficulties were associated with symptoms of depression and somatization, which is consistent with previous studies that found an association between sleep difficulties and depression and somatization.[59,60] Contradictory findings have found that depression may lead to insomnia and that sleep difficulties may contribute to depression.[61] It is possible that the women's problematic situations (eg, history of child abuse) may have led to sleep difficulties, which over time resulted in a range of sadness, hopelessness, and body sensations characteristics of symptoms of depression and somatization. Depression and somatization involve various sensations (eg, loss of interest and musculoskeletal pains) which, if persistent, might over time result in sleep difficulties. However, due to the cross-sectional character of our data, a causal inference could not be made.

The association between smoking and symptoms of anxiety is consistent with previous studies.[62–64] As we did not assess in depth the participant's smoking patterns, it is difficult to fully assess the role of smoking in this study. However, one could hypothesize that these women smoked in order to alleviate the symptoms of anxiety. Social attachment was negatively associated with symptoms of depression and anxiety, suggesting a protective effect against mental health consequences. Women with persons (eg, family members) with whom they could share, eg, deep emotions and preoccupations tend to be less likely to experience intense and persistent depressive and anxious symptoms, which is consistent with previous observations that such ties have a protective effect in depression and anxiety.[65–67] Possible explanations may be that the women developed self-esteem and gained much needed support that helped them to cope with the strains of depressive and anxious symptoms. Nevertheless, social attachment and social integration were positively associated with symptoms of somatization. Although the role of social support in somatization appears to be complex, it may be that persons (eg, family members and work colleagues) with whom the women could share, talk freely about various matters, and turn to for moral support may also have been more likely to experience somatic symptoms themselves. However, low social support has been associated with increased levels of somatic complaints among elderly in seven European countries,[68] whereas another study with younger participants revealed no relation between social support and somatization.[69] Studies on abused women reported that social support has moderating effects upon or reduces the risk of somatic complaints and poor physical

health.[67] The findings in the present study are inconsistent with these previous studies, and it is possible that the complaints of the women in our study may have led to support, which in turn led to more frequent complaints and perhaps their exacerbation. However, more research into the relation of social support and somatization is warranted, particularly in the African context.

Consistent with findings in other studies, not having an education was positively associated with symptoms of depression, which highlights the links among lower educational attainment, IPV, and higher levels of depressive symptoms.[70,71] Without an education, abused women are economically dependent on their partners, often face repeated or long periods of abuse, and are either uninformed about social services or too scared to access these services. The inherent lack of social support further worsens their social isolation and ultimately leads to depression.

Being married/cohabitant was negatively associated with symptoms of depression, which is in accord with previous data, indicating that married/cohabitant people in comparison with divorced, separated or widowed people show less numerous, intense, and persistent depressive symptoms.[72] Explanations for this phenomenon include, eg, that married/cohabitant persons may have more social resources and support, which could serve as protective factors against depression.[72]

Age was associated with symptoms of somatization. In our sample, younger adult women were more likely to exhibit symptoms of somatization, which might be the result of a combination of factors, including economic dependence on their intimate partners, the main effects of IPV, possible experience of IPV in childhood, as well as biological factors related to sex and puberty, which may intensify physical sensations of symptoms somatization. Our findings are consistent with prior studies that indicated a close link between younger age and somatization.[73]

Finally, the strong association observed between comorbidity and symptoms of depression, anxiety, and somatization in this study is consistent with findings from previous epidemiological studies in the general population,[74–77] and may only mirror an already well known comorbidity among these conditions, which occur frequently among women.[78]

Limitations

This study has several limitations. First, firm temporal relations and causal links cannot be established with a cross-sectional study and therefore require another type of study design. Second, the sample of women was limited to women who sought legal aid at the Forensic Services unit of Maputo Central Hospital, Maputo City, and they all had prior experiences of IPV. Conclusions cannot therefore be generalized to the general population since the sample may not be representative of women in the rest of the country, and their IPV experiences could either differ or be similar to those of women in general (though some of our results were consistent with those of other studies). Third, data for this study relied on women's self-report and subjective assessment of their mental health. Hence, the accuracy of data could not be objectively verified. However, the SCL-90-R is sensitive to depressive disorders.[46] Fourth, in-depth assessment of certain variables (eg, how much alcohol was consumed in a typical drinking day) could not be performed. Fifth, all instruments were translated into Portuguese, back-translated, and culturally adapted, which may result in human error. However, some of our findings are congruent with other data, and the Cronbach's α were generally high. Sixth, CTS2 covers a limited number of psychological abuse dimensions. However, despite its limitations, CTS2 is one of the most widely used tools for identifying IPV and indeed captures central aspects of IPV in a reliable and valid manner.[47] Seventh, many of the women were both victims and perpetrators of IPV, which could have influenced our results. Thus, caution should be used in interpreting the results although they are in some areas congruent with observations from other studies. In spite of these limitations, this study may have provided new insights into the relation between women's sustained and inflicted IPV and mental health, at least in the context of Mozambique.

Conclusion

A large number of our women who sustained or inflicted the various types of IPV reported relatively high levels of symptoms of depression, anxiety, and somatization. Moreover, 25.9% and 25.5% of women as victims and perpetrators, respectively, showed psychopathological levels across these mental dimensions within or above those reported by psychiatric out patients. Important factors in explaining mental health problems included controlling behaviors, mental comorbidity, social support, not having any education, age, smoking, abuse as a child, and sleep difficulties. The findings contribute to the literature on the relation between women's IPV victimization and/or perpetration and mental health within the context of Mozambique. More research into the relation between

women's IPV victimization and/or perpetration and mental health, and between controlling behaviors and mental health is warranted.

Disclosure

The authors report no conflicts of interest in this work.

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