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ORIGINAL PAPER

Gender-based violence and mental disorders in female college students

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Abstract
Purpose To assess the association between gender-based violence and DSM-IV Axis I disorders in female college students.
Methods A stratified random sample of 1,043 college women (average age 22.2 years) participated in the study. We collected sociodemographic, socioeconomic and academic information as well as information on the participants' experience of gender-based violence victimization. The presence of mental disorders during the 12 months preceding the study was assessed by clinically trained interviewers applying the Structured Clinical Interview for DSM-IV Axis I disorders-Clinician Version (SCID-CV).
Results 15.2% of the participants reported lifetime gender-based violence victimization. Almost two-thirds of the victims had suffered some Axis I disorder during the past year, a significantly larger proportion than among non-victims (OR = 3.72; 95% CI 2.61–5.30). Mood disorders and anxiety disorders were both significantly more common among victims than non-victims (OR = 4.26; 95% CI 2.81–6.46 and OR = 1.97; 95% CI 1.20–3.24, respectively). The most prevalent individual disorder among victims was major depressive disorder (26.41%). Among victims of purely psychological violence, the overall rate of Axis I disorder was similar to the rate among other victims (67 and 61%, respectively).
Conclusions Among female university students, the experience of physical or psychological gender-based violence is associated with mental disorder. These findings suggest the need for treatment and prevention interventions designed specifically for this population.

Keywords Prevalence · Gender-based violence · Young women · Mental disorders

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Introduction

Gender-based violence is currently a major public health problem in all parts of the world, encompassing a multitude of forms of gender-motivated abuse directed against women in the course of their lives [1]. In most cases, the aggressor is the male intimate partner of the victim, and between 15 and 71% of women who have had a male partner have suffered physical and/or sexual violence [2].

A great amount of personal suffering is caused by this widespread abuse. Gender-based violence often leaves its victims with a lasting feeling of threat to their life and emotional well-being, and is a risk factor for mental illness [3–5]. Among women who have experienced violence at the hands of their intimate partner, the prevalence of mental disorder is approximately 50% [6], victims being six times more likely than non-victims to experience psychological problems [7]. The most common psychological symptoms are anxiety, symptoms of depression, poor self-esteem, emotional lability, hypoactive sexual desire, permanent fatigue, and insomnia [8–10]. The most common psychiatric disorders associated with gender-based violence victimization are depression [11–18] and posttraumatic stress disorder [12, 18–22], although anxiety disorders, dissociative disorders, attempted suicide, eating disorders, drug dependence,

and subclinical psychotic phenomena are also found [12, 23–26]. These adverse consequences of mental health may derive from recurrent fear and learned helplessness [8, 27, 28]. Additional outcomes associated with violence include poor physical health [4, 29–32], diminished psychosocial functioning [29], increased mortality [30], diminished academic performance, high dropout rates [33], and increased use of medical services [34]. These problems frequently persist chronically once the abuse has ended [35].

Although the evidence of a relationship between gender-based violence victimization and mental illness is thus overwhelming, the generalizability of many studies in this area is limited by their having been conducted with convenience samples [10, 13, 18, 20, 36] or samples taken from social or health centres [3, 7, 10, 13, 18, 20, 36, 37], or by their having evaluated mental health through questionnaires (primarily assessing symptoms of anxiety and depression), without using standardized diagnostic criteria, such as those of DSM-IV or ICD-10 [4, 6–10, 13, 16, 29, 31, 36–38]. Moreover, the impact of psychological violence has been less extensively studied than those of physical violence or sexual violence, probably because of methodological difficulties [39]; and most studies have focused on intimate partner violence [30] to the exclusion of violence within a wider range of relationships. In fact, even studies of intimate partner violence have focused on adult married women [10, 36, 37, 40], despite such violence usually having commenced before marriage or cohabitation [41] (occurring more often to women under 30 than over [42], and with greatest risk reported for under 24 s [43, 44]).

Within the limits imposed by our study population (female university students), our research aims at greater generality and precision by evaluating association between mental illness and all kinds of gender-based violence against women, within any kind of male–female relationship, using a non-clinic sample and DSM-IV criteria for a wide range of mental disorders. University students are typically within the high-risk under 24 age group, and although some types of relationship (e.g., husband–wife or mother–son) are clearly under-represented, this group is nevertheless representative of 18–24 years, about half of whom attend university [45]. Prevalence rates for gender-based violence victimization among female university students range from 15.2 to 53% [46–48]. The present analysis concerns the 12-month prevalence of psychiatric disorders, comparing (1) victims of gender-based violence with non-victims, and (2) victims of purely psychological and other types of gender-based violence.

Methods

Sample

The study sample was taken from the college population of Galicia, a region of northwest Spain with an area of 29,434 km^2, a population of 2,730,337 inhabitants, and three universities: the University of A Coruña (with 2 campuses, Coruña and Ferrol), the University of Santiago de Compostela (2 campuses, Santiago and Lugo), and the University of Vigo (3 campuses, Vigo, Pontevedra and Ourense). The participants were recruited during the first term of the academic year 2008–2009, before the examination period; at that time there were 42,138 female students out of a total of 71,981. We used the student records of the universities to select a random sample of 1,054 female students stratified by year of study (1st to 3rd year; 4th to final year; postgraduate) and academic area (humanities and social sciences, biological/health sciences, other sciences. To allow for dropouts and refusals to participate, the initial sample size was slightly larger than the 1,014 calculated as necessary for a precision of ± 2 and $\alpha = 0.05$ on the basis of the abuse rate of 12% estimated in a pilot study.

The selected students were contacted personally by mail or phone, and were invited to participate in the study after being informed of its nature, aims, risks, and benefits. Informed consent was obtained from each participant. The confidentiality and anonymity of their responses was guaranteed, and all participants' questions were answered. Participation was voluntary and resulted in no academic, monetary, or other compensation.

To minimize the loss of subjects, experts on psychological assessment and treatment with wide experience of university population studies were involved, and the sample collection strategies recommended by Hulley, Newman, and Cummings were employed [49]; the study was presented appealingly, a systematic series of repeated contact attempts was programmed, reminders of the interview date were given, and information collection was as non-invasive and pleasant as possible. The study was reviewed and approved by the University of Ethics Committee.

The response rate was 98.9%. Eleven students declined to participate, leaving a final sample of 1,043 women with mean age 22.2 years (SD = 3.1) and the following other pertinent characteristics: 59.8% had an intimate male companion, 60.1% were of urban origin, 59% had parents of medium educational level (high, 35%; low, 6%), 54.9% were from families with annual incomes ≥30,000 € (18,000–29,999 €, 26.7%; <18,000 €, 18.4%), 92.9% were not financially independent, 51.6% were at the fourth to final year stage of their studies (1st to 3rd year, 43.4%; postgraduate, 5.0%), and 60.7% were studying humanities or social sciences (biological and health sciences 13.8%; other sciences 25.5%).

Instruments

Participant characteristics

Data were collected on participants' demographic characteristics (age, current relationship status, geographical

background), socioeconomic background (parents' educational level, family annual income, participant's financial independence), and academic situation (year of study course, academic area).

Gender-based violence interview questionnaire

Information on a participant's experience of physical and psychological violence, sexual and otherwise, at the hands of males connected to her by a wide range of relationships (intimate partner, relative, friend, classmate, acquaintance, person in authority, stranger) was collected using an ad hoc questionnaire administered by an interviewer (see "Appendix"). Existing validated gender-based violence scales were not used primarily because they focus exclusively on intimate partner violence (and also because most are very time consuming).

The three items in our instrument were based on the violence against women instrument of the World Health Organization (WHO) [50] and on scales used in previous studies [46, 47, 51]. In accordance with WHO guidelines [52], the overlapping categories of sexual, psychological and physical violence were distinguished. Physical violence was defined as any act of physical aggression (e.g. slapping, biting, grabbing or hitting) or infliction of any kind of physical harm. Psychological violence was defined as an action or set of actions that directly impairs the victim's psychological integrity (e.g. preventing the victim from seeing family or friends, belittlement, or humiliation). Sexual violence was defined as any form of sexual abuse or coercion (e.g. forcing the victim to have sexual intercourse or participate in other undesired sexual activity through physical means, threats, or intimidation).

Affirmative item responses were entered on the basis of the interviewer's judgement as to whether the violence suffered was gender based or not, not exclusively on the basis of the subject's answer to the question (additional pertinent questions were asked if necessary). Violence was deemed to have been gender based if it was used to maintain and reinforce the victim's subordination (even though the interviewee might have interpreted it otherwise, as normal or deserved behaviour), was not an instance of violence aimed at a particular group without regard to gender (e.g. parental violence towards children without differentiation between boys and girls), and was not primarily of a different nature (such as assault or intimidation in the course of robbery). Individual episodes of violence were not necessarily assigned to just one of the three categories (physical, psychological, and sexual). Information about the victim's age at the time of episodes of violence and the identity of the aggressor was also collected.

Structured Clinical Interview for DSM-IV Axis I disorders-Clinician Version (SCID-CV)

The SCID-CV [53] is a structured interview performed by a clinician to diagnose the most common DSM-IV Axis I disorders. It comprises six modules, A to F, that are respectively targeted at mood episodes, psychotic symptoms, psychotic disorders, mood disorders, substance use disorders, and anxiety and other disorders (including disorders without diagnostic criteria). Each item corresponds to a diagnostic criterion, and is rated '+' or '−' according to whether, in the interviewer's judgement, it is true or false (or at least doubtful) that the corresponding diagnostic criterion is satisfied. This judgement is not necessarily to be made exclusively on the basis of the patient's replies, but on the basis of sufficient relevant information from all available sources, the information that is relevant being specified in the instructions for the item. The SCID-CV has been shown to be highly reliable, with reported κ values of 0.70–1.00 [54]. We used the published Spanish version, except that questions were asked with respect to the previous 12 months rather than the previous month or the participant's whole lifetime.

Caffeine dependence, which is not a DSM-IV disorder, was assessed by applying the following DSM-IV criteria for substance dependence: tolerance (criterion 1), withdrawal symptoms (criterion 2), desire or unsuccessful efforts to reduce or limit use (criterion 4), and continued use despite awareness of the continuing or recurrent physical or psychological problems that are likely to be caused or intensified by use (criterion 7).

Procedure

Each participant was interviewed face to face, in accordance with the WHO guidelines [50] and in a place proposed by the participant, by one of three female psychologists. The participants first answered questions on their demographic, socioeconomic, and academic characteristics and experience of gender-based violence, as described above (see "Instruments"), after which the presence of mental disorder was determined using the SCID-CV.

Although the interviewers all had 3–6 years' experience of clinical assessment and diagnosis, and had taken part in other studies of college students, for this study they received special training by two clinicians with an average 20 years of clinical experience each who belong to the faculty of the University of Santiago de Compostela; one, a doctor of psychology and the other, a doctor of psychiatry. Training consisted of four 90-min sessions in which satisfactory performance was achieved through successive cycles of (1) discussion of fundamental interview and role-playing skills, (2) recorded practice interviews of ten

women with characteristics similar to those of the study participants, and (3) analysis of the recorded interviews.

Statistical analyses

For each sociodemographic, socioeconomic, and academic variable, the distributions of both victims and non-victims among levels of the variable were determined, and odds ratios (ORs) for victimization were calculated with respect to a reference level. The relative frequencies with which victims and non-victims suffered each Axis I disorder (and caffeine dependence) were used, whenever there were cases among both victims and non-victims, to calculate ORs for the disorder, with and without adjustment for geographical background, family annual income, and academic area by means of multiple logistic regression (these possible confounders were selected on the basis of the relevant literature and the results of the analysis of sociodemographic, socioeconomic, and academic variables).

Similar analyses were performed in which participants, who had only suffered psychological gender-based violence were compared with all other victims (see "Results" for the composition of the latter group), except that in this case ORs for mental disorders were adjusted for geographical background, family annual income, age at which violence had first been suffered (<15 years or ≥15 years) and (except for caffeine dependence) financial independence.

All statistical analyses were performed using SPSS software (version PASW Statistics 18).

Results

Victims versus non-victims of gender-based violence

A total of 159 college women (15.2%) had experienced gender-based violence at the hands of a male at some time during their lives. Of these 159, 32 (20.1%) were victims before the age of 15 years (23 of them only during this period), and the remaining 127 (79.9%) only at later ages, but post-15 violence was statistically favoured by pre-15 violence (OR = 2.72; 95% CI 1.23–6.01). Seventy-eight cases (49.1%) involved an intimate partner and 81 (50.9%) some other male (acquaintance, stranger, friend, relative, classmate, person in authority).

The odds on being a victim of gender-based violence were significantly greater for students of urban than rural origin (OR = 1.96); smaller for students from families with an income of 18,000–30,000 € than for those from families with lower incomes (OR = 0.52); and smaller for students of biological and health sciences, or other non-social sciences, than for students of humanities and social sciences (OR = 0.48 and OR = 0.57, respectively) (Table 1).

The odds of suffering an Axis I disorder in the past 12 months were significantly greater for victims of gender-based violence than for non-victims (adjusted OR = 3.71; Table 2). Among the various classes of disorder, the same was true for mood disorders (adjusted OR = 4.51) and anxiety disorders (adjusted OR = 2.01), but not for other classes. Among individual disorders, victims had significantly greater odds than non-victims in the cases of major depressive disorder (adjusted OR = 5.36), specific and social phobias (adjusted OR = 3.45 and OR = 2.31, respectively), posttraumatic stress disorder (adjusted OR = 9.66), caffeine dependence (adjusted OR = 6.27), and eating disorder not otherwise specified (adjusted OR = 5.86), but not for dysthymic disorder, obsessive–compulsive disorder, generalized anxiety disorder, or nicotine dependence. For no disorder were the odds significantly greater for non-victims than for victims.

Victims of purely psychological versus other gender-based violence

Eighty-two of the 159 victims of gender-based violence (51.6%) had suffered only psychological violence. Of the other 77, 56 had suffered only physical violence, 9 both physical and psychological violence, 6 purely sexual violence, and 6 both physical and sexual violence. The odds on having suffered only psychological violence were greater if violence was first suffered after the age of 15 years than if earlier (OR = 5.15; 95% CI 2.07–12.79). If violence was suffered at the hands of an intimate partner that violence was more likely to have been purely psychological than if the aggressor was not an intimate partner (OR = 2.21; 95% CI 1.17–4.17).

The odds on having suffered violence with physical and/or sexual components, rather than only psychological violence, were significantly greater with an urban than with a rural background (OR = 5.35); significantly greater if the annual income of the victim's family was in either the 18,000–30,000 € or the ≥30,000 € brackets than if it were <18,000 € (OR = 2.97 and OR = 2.53, respectively); and significantly smaller if the victim was financially independent (OR = 0.11) (Table 3). There were no significant differences between the victims of purely psychological and other gender-based violence as regards the odds on suffering an Axis I disorder in the past 12 months (Table 4).

Discussion

This study examined the association between DSM-IV Axis I disorders and a history of having suffered gender-based violence at the hands of some male aggressor

Table 1 Sociodemographic, socioeconomic and academic characteristics of victims and non-victims of gender-based violence ($n = 1,043$)

Characteristic	Victims ($n = 159$) n (%)	Non-victims ($n = 884$) n (%)	OR (95% CI)
Age (years)			
≤19	27 (16.98)	183 (20.70)	1 [Reference]
>19	132 (83.02)	701 (79.30)	1.27 (0.81–1.99)
Current relationship status			
Without partner	55 (34.59)	364 (41.18)	1 [Reference]
With partner	104 (65.41)	520 (58.82)	1.32 (0.93–1.88)
Geographical background			
Rural	43 (27.04)	373 (42.19)	1 [Reference]
Urban	116 (72.96)	511 (57.81)	1.96 (1.35–2.86)
Educational level of parents			
Low	7 (4.41)	56 (6.33)	1 [Reference]
Medium	80 (50.31)	535 (60.52)	1.19 (0.52–2.71)
High	72 (45.28)	293 (33.15)	1.96 (0.86–4.49)
Family annual income (€)			
<18,000	36 (22.64)	156 (17.65)	1 [Reference]
18,000–29,999	30 (18.87)	248 (28.05)	0.52 (0.31–0.88)
≥30,000	93 (58.49)	480 (54.30)	0.84 (0.54–1.28)
Financial independence			
No	142 (89.31)	827 (93.55)	1 [Reference]
Yes	17 (10.69)	57 (6.45)	1.73 (0.98–3.07)
Year of study			
1st to 3rd year	60 (37.74)	393 (44.46)	1 [Reference]
4th to final years	91 (57.23)	447 (50.56)	1.33 (0.93–1.89)
Postgraduate	8 (5.03)	44 (4.98)	1.91(0.53–2.65)
Academic area			
Humanities and social			
Sciences	115 (72.33)	518 (58.60)	1 [Reference]
Biological/health sciences	14 (8.80)	130 (14.70)	0.48 (0.27–0.87)
Other sciences	30 (18.87)	236 (26.70)	0.57 (0.37–0.88)

(including, but not exclusively, an intimate partner) in a representative sample of female college students. As far as we know, no previous study has employed DSM-IV Axis I criteria to relate mental illness to gender-based violence victimization in a non-clinic population of young women; in particular, no previous study has compared the victims of psychological and physical or sexual gender-based violence with regard to mental illness diagnosed using these criteria.

One in six participants had suffered gender-based violence at some point of their lives. Previous studies have also found high lifetime rates of gender-based violence victimization among female university students [46, 47] and other young non-clinic female populations [43, 44]. In the present study, 80% of victims had not suffered gender-based violence before the age of 15 years, and almost 50% had suffered gender-based violence from an intimate partner. Adolescence is a period of increasing interaction with other people, especially young people of the opposite sex. Previous studies have found that violence is at least as frequent in couples aged 16–20 years as in adult couples [55, 56].

According to DSM-IV criteria, almost two-thirds of the 159 sometime victims of gender-based violence had suffered at least one Axis I psychiatric disorder during the year preceding their interview in this study. This confirms previous reports of a high prevalence of mental illness among victims of gender-based violence [6, 12]. Although the existing literature has generally reported higher rates of individual mental disorders than those found in the present study, these earlier studies generally did not use standardized diagnostic criteria, and did use convenience samples recruited in primary care and mental health centres or shelters for abused women, where it is reasonable to expect higher disorder rates.

The most prevalent disorders among victims in this study were mood and anxiety disorders. The most frequent

Table 2 Prevalence of mental disorders among victims of gender-based violence and non-victims ($n = 1,043$)

Diagnosis	Victims ($n = 159$) n (%)	Non-victims ($n = 884$) n (%)	OR (95% CI)	Adjusted OR[a] (95% CI)
Any Axis I disorder	102 (64.15)	287 (32.46)	3.72 (2.61–5.30)	3.71 (2.57–5.35)
Mood disorders	46 (28.93)	77 (8.71)	4.26 (2.81–6.46)	4.51 (2.88–7.06)
MDD	42 (26.41)	52 (5.88)	5.74 (3.66–9.01)	5.36 (3.36–8.54)
Dysthymic disorder	4 (2.52)	14 (1.58)	1.60 (0.52–4.93)	1.21 (0.38–3.77)
Due to medical condition	0	7 (0.79)	–	–
Substance induced	0	4 (0.45)	–	–
Anxiety disorders	37 (23.27)	105 (11.87)	1.97 (1.20–3.24)	2.01 (1.21–3.35)
Specific phobia	8 (5.03)	11 (1.24)	4.20 (1.66–10.62)	3.45 (1.34–8.87)
Social phobia	16 (10.06)	39 (4.41)	2.24 (1.31–4.45)	2.31 (1.23–4.34)
OCD	2 (1.26)	12 (1.36)	0.92 (0.20–4.17)	1.28 (0.27–6.08)
PTSD	7 (4.40)	6 (0.68)	6.73 (2.23–20.32)	9.66 (3.00–31.12)
GAD	4 (2.52)	24 (2.71)	0.92 (0.31–2.70)	0.95 (0.32–2.86)
Panic disorder	0	6 (0.68)	–	–
NOS	0	7 (0.79)	–	–
Substance dependence disorders	29 (18.24)	131 (14.82)	1.28 (0.82–1.99)	1.20 (0.76–1.89)
Nicotine	19 (11.94)	119 (13.46)	0.87 (0.52–1.46)	0.76 (0.45–1.29)
Caffeine	8 (5.03)	12 (1.36)	3.85 (1.54–9.57)	6.27 (2.31–17.01)
Other	2 (1.26)	0	–	–
Eating disorders	3 (1.89)	6 (0.68)	2.81 (0.69–11.37)	3.42 (0.81–14.36)
Bulimia nervosa	0	3 (0.34)	–	–
NOS	3 (1.89)	3 (0.34)	5.64 (1.13–28.23)	5.86 (1.11–30.84)

MDD major depressive disorder, *OCD* obsessive–compulsive disorder, *PTSD* posttraumatic stress disorder, *GAD* generalized anxiety disorder, *NOS* not otherwise specified

[a] Adjusted for geographical background, annual family income and academic area

mood disorder was major depressive disorder (MDD), and the most frequent anxiety disorders were phobias and posttraumatic stress disorder (PTSD). Of these, MDD and PTSD are the disorders that have most often been highlighted in the gender-based violence literature [13, 18].

In Golding's [12] meta-analysis of mental disorders among female victims of violence at the hands of intimate partners, MDD had a prevalence of 15–83% (weighted mean 47.6%) in studies using diagnostic criteria. Although existing data are insufficient for inference of causality, there are features pointing in this direction. For example, among women with MDD who have suffered gender-based violence, the first episode of depression normally coincides with the beginning of violence [57], and the point prevalence of depression decreases following the cessation of the risk of violence [58]. In addition, in a prospective cohort study, women involved in abusive relations had an increased risk of psychiatric morbidity even after correction for a history of psychiatric disorder [59].

The prevalence of PTSD in Golding's meta-analysis [12] was 31–84% (weighted mean 63.8%) in studies using diagnosis criteria. More recent evidence of a relationship between gender-based violence and PTSD includes reports by Stein and Kennedy [18] and by Street and Arias [22]. Symptoms of PTSD can persist in abused women long after the end of the abusive relationship [60].

Although gender-based violence might be expected to breed phobias, phobias have in fact received little attention in the gender-based violence literature. In the present study, they were the most common type of anxiety disorder among victims, social phobia having a particularly high prevalence of 10.1%. It is generally accepted that phobias result from interaction between a constitutional diathesis and environmental stressors [61]. Some people are constitutionally prone to phobias and were born with a specific temperament called behavioural inhibition to the unknown. However, a chronic environmental stressor may affect that person's temperamental disposition and cause to develop a phobic disorder; that is, a stressor like the violence can stimulate a latent diathesis within the person and turn him into a symptomatic.

Previous research on gender-based violence has typically focused more on physical and sexual violence than on psychological violence. However, it is psychological violence that is most often reported by college victims, at least in the case of intimate partner violence [62, 63], and in this

Table 3 Sociodemographic, socioeconomic and academic characteristics of victims of purely psychological and physical/sexual gender-based violence ($n = 159$)

Characteristic	Physical/sexual ($n = 77$) n (%)	Psychological ($n = 82$) n (%)	OR (95% CI)
Age (years)			
≤19	13 (16.88)	14 (17.07)	1 [Reference]
>19	64 (83.12)	68 (82.93)	1.01 (0.44–2.32)
Current relationship status			
Without partner	29 (37.66)	26 (37.71)	1 [Reference]
With partner	48 (62.34)	56 (68.29)	0.76 (0.39–1.47)
Geographical background			
Rural	9 (11.69)	34 (41.46)	1 [Reference]
Urban	68 (88.31)	48 (58.54)	5.35 (2.35–12.18)
Educational level of parents			
Low	3 (3.90)	4 (4.88)	1 [Reference]
Medium	45 (58.44)	35 (42.68)	1.71 (0.36–8.16)
High	29 (37.66)	43 (52.44)	0.89 (0.18–4.31)
Family annual income (€)			
<18,000	11 (14.29)	25 (30.49)	1 [Reference]
18,000–29,999	17 (22.08)	13 (15.85)	2.97 (1.08–8.17)
≥30,000	49 (63.63)	44 (53.66)	2.53 (1.11–5.73)
Financial independence			
No	75 (97.40)	67 (81.71)	1 [Reference]
Yes	2 (2.60)	15 (19.49)	0.11 (0.02–0.54)
Year of study			
1st to 3rd year	29 (37.66)	31 (38.80)	1 [Reference]
4th to final year	44 (57.14)	47 (57.32)	1.00 (0.52–1.92)
Postgraduate	4 (5.20)	4 (4.88)	1.06(0.24–4.67)
Academic area			
Humanities and social sciences	54 (70.13)	61 (74.39)	1 [Reference]
Biological/health sciences	8 (10.39)	6 (7.32)	1.50 (0.49–4.61)
Other sciences	15 (19.48)	15 (18.29)	1.13 (0.50–2.52)

study there were about 50% more victims of purely psychological violence than victims of purely physical violence (82 vs. 56), with other forms much less prevalent. The distinction made in the present study between the victims of exclusively psychological violence on the one hand, and all other victims on the other, is in line with groupings employed in previous studies [29, 31], and is justified partly by the absence of significant differences in physical and psychological symptoms between physically and sexually abused women [30], and partly by the desirability of not ignoring the members of groups that were too small for statistically meaningful comparison with the major groups. Victims first abused when of age 15 years or older were more than five times more likely to have suffered only psychological violence than those first abused when younger, and violence exerted by intimate partners was more likely to be psychological than violence exerted by other aggressors. Furthermore, psychological violence not only had an impact on mental health, as has been observed previously [7, 22, 31, 64], but this impact was similar to that of physical violence, in consonance with the findings of O'Leary [65]; and although the best-documented mental health consequences of psychological abuse concern depression [66], in this study other mental health problems were also significant.

The sample used in this study was representative of female college students, the rejection rate was low, and the response rate was high. Nevertheless, as was pointed out in the "Introduction", the results obtained for college students are not necessarily generalizable to other non-clinic populations. In addition, since our psychiatric data referred only to the past 12 months and our victimization data to the participant's entire life, we cannot be sure that the onset of any psychiatric disorder followed rather than preceded any experience of violence. It is even possible that some participants may have been assigned an erroneous victimization status, since on the one hand victims tend to underreport episodes of violence [67], while on the other,

Table 4 Prevalence of mental disorders among victims of purely psychological and physical/sexual gender-based violence ($n = 159$)

Diagnosis	Physical/sexual ($n = 77$) *n* (%)	Psychological ($n = 82$) *n* (%)	OR (95% CI)	Adjusted OR[a] (95% CI)
Any Axis I disorder	47 (61.03)	55 (67.07)	0.77 (0.40–1.47)	1.12 (0.49–2.56)
Mood disorders	19 (24.67)	27 (32.92)	0.66 (0.33–1.33)	0.93 (0.40–2.13)
MDD	19 (24.67)	23 (28.04)	0.84 (0.41–1.70)	1.39 (0.58–3.29)
Dysthymic disorder	0	4 (4.88)	–	–
Anxiety disorders	17 (22.08)	20 (24.39)	0.88 (0.42–1.83)	0.91 (0.39–2.14)
Specific phobia	4 (5.19)	4 (4.88)	1.06 (0.25–4.43)	0.92 (0.20–4.25)
Social phobia	5 (6.49)	11 (13.41)	0.45 (0.14–1.35)	0.35 (0.09–1.31)
PTSD	2 (2.60)	5 (6.10)	0.41 (0.07–2.18)	0.57 (0.08–3.98)
OCD	2 (2.60)	0	–	–
GAD	4 (5.19)	0	–	–
Substance dependence disorders	13 (16.88)	16 (19.51)	0.84 (0.38–1.88)	1.03 (0.35–3.04)
Nicotine	7 (9.09)	12 (14.63)	0.58 (0.21–1.56)	0.67 (0.20–2.21)
Caffeine	4 (5.19)	4 (4.88)	1.06 (0.25–4.43)	1.21 (0.17–8.37)
Other	2 (2.60)	0	–	–
Eating disorders	0	3 (3.66)	–	–
NOS	0	3 (3.66)	–	–

MDD major depressive disorder, *PTSD* posttraumatic stress disorder, *OCD* obsessive–compulsive disorder, *GAD* generalized anxiety disorder, *NOS* not otherwise specified

[a] Adjusted for geographical background, annual family income, age at which violence had been suffered (less than or greater than 15 years), and (except for caffeine dependence) financial independence

persons with certain mental disorders, such as depression, can tend to exaggerate possible episodes of violence, psychological violence in particular [6]. To minimize both these distortions, we took pains to follow an appropriate procedure in the development and application of the questionnaire, including the use of specific, behaviourally formulated, operational definitions grounded in the literature for each type of violence (so as to limit the scope of the participant's interpretation of the questions), the use of items from the instruments employed in previous studies, the explicit assurance of anonymity and confidentiality, and the use of clinical interviews conducted by trained, experienced female clinicians. It is nevertheless possible that in adopting these measures we may have favoured other kinds of distortion, since reported prevalences of different kinds of violence depend on how the different kinds are defined and evaluated [68]. In particular, the use of separate items for each of the three types of violence distinguished, and the fact that the questions were designed to elicit reports of acts and threats rather than more subjective experiences, may possibly have been at least partly responsible for the rather surprisingly low reported prevalence of psychological abuse among victims of physical or sexual abuse.

In conclusion, in this study, there was a high 12-month prevalence of mental illness among female university students, who had been victims of gender-based violence. Further studies, likewise using clinical criteria, should be carried out to obtain exact estimates for other groups of women and for the general female population, and to investigate possible relationships between type of disorder and type of violence. Longitudinal studies are also needed, to clarify the causal nature of the relationship between gender-based violence and mental disorders; as is research on the extent to which individual and psychosocial factors (such as personality traits, coping styles, or social support) may mediate or modulate the relationship between gender-based violence and mental health. Finally, our findings suggest a need to design innovative and effective interventions for the prevention and treatment of mental health problems in young victims of gender-based violence, both to improve their psychosocial functioning and to enable them to free themselves from their aggressors. Primary prevention programmes should include, for college settings, specific sub-programmes featuring brief educational interventions focused on healthy relationships. Secondary prevention should involve systematic referral of female students reporting violence to campus mental health services or healthcare points; and, contrariwise, systematic investigation of whether young females being screened for psychiatric disorders have suffered gender-based violence.

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Appendix

Gender-based violence interview questionnaire

I will ask you some questions about your relations with other people and their nature. All the information provided will be treated as confidential and you are not obliged to answer those questions you do not want to. If someone comes in, I will change the subject of our conversation. We will start when you are ready.

1. Have you ever been slapped, bitten, grabbed, pushed, hit, kicked, strangled, threatened with a weapon, or otherwise physically hurt or threatened by anyone?

0. No 1. Yes.
For each such experience, state at what age and by whom.
1)_____
2)_____
3)_____
4)_____

2. Have you ever been offended, humiliated, ridiculed, underestimated, frightened, threatened, isolated, controlled, financially deprived, or psychologically or emotionally abused in some other way by anyone?

0. No 1. Yes.
For each experience, state at what age and by whom.
1)_____
2)_____
3)_____
4)_____

3 Have you ever been pressured, coerced or forced by anyone to have sexual intercourse, or to participate in any undesired sexual activity, or to avoid the use of methods of contraception or protection against sexual transmission of disease?

0. No 1. Yes.
For each experience, state at what age and by whom.
1)_____
2)_____
3)_____
4)_____

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