Exposure to violence and mental health problems in low and middle-income countries: a literature review

Exposição à violência e problemas de saúde mental em países em desenvolvimento: uma revisão da literatura

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Abstract

Objective: *To study the epidemiological evidence on the prevalence of exposure to violence and its relationship with mental health problems in low and middle-income countries.* ***Method:*** *The search was based on cross-sectional and cohort studies available in electronic databases (Medline, Psycinfo, Embase, SciELO and Lilacs), through July 2009, using the key words: "violence" and "mental disorders".* ***Results:*** *The frequency of exposure to violence was shown to be very high and was significantly associated with mental health problems. Among children, the highest correlation was found to be of domestic violence with externalizing problems (OR = 9.5; 95% CI = 3.4-26.2), and suicidal ideation with sexual abuse (OR = 8.3; p < 0.05); among women, depression/anxiety symptoms correlated with intimate-partner psychological (OR = 3.2; 95% CI = 1.8-5.8) and sexual (OR = 9.7; 95% CI = 1.9-51.2) violence. In the general population, the highest prevalence rates of post-traumatic stress disorder were associated with sexual and domestic violence, kidnapping, and cumulative trauma exposure. Violence also correlated with common mental disorders.* ***Conclusion****: A substancial part of the mental health problems in low and middle-income countries can be attributed to violence. Thus, interventions directed to decrease violence in low and middle-income countries might have a major positive impact on the mental health of those living in these settings.*

Descriptors: *Violence; Mental disorders; Cross-sectional studies; Cohort studies; Review*

Resumo

Objetivo: *Estudar os achados epidemiológicos sobre a prevalência de exposição à violência e a associação entre exposição à violência e problemas de saúde mental em países em desenvolvimento.* ***Método:*** *A revisão foi baseada em estudos de corte transversal e de coorte encontrados em bases de dados eletrônicas (Medline, Psycinfo, Embase, SciELO e Lilacs) até o mês de julho de 2009. As palavras-chave utilizadas foram: "violência" e "transtornos mentais".* ***Resultados:*** *Exposição à violência em países em desenvolvimento é bastante frequente e está significantemente associada a problemas de saúde mental. Em crianças, a maior associação encontrada foi entre violência doméstica e problemas de externalização (OR = 9,5; IC 95% = 3,4-26,2), e entre ideação suicida e abuso sexual (OR = 8,3; p < 0,05); entre as mulheres, sintomas de depressão e ansiedade estão correlacionados com violência conjugal psicológica (OR = 3,2; IC 95% = 1,8-5,8) e violência sexual (OR = 9,7; 95% IC = 1,9-51,2). Na população geral, as maiores taxas de prevalência de transtorno de estresse pós-traumático estão associadas com violência sexual e doméstica, sequestro, e exposição a múltiplos eventos traumáticos. Violência também está associada com transtornos mentais comuns na população geral.* ***Conclusão:*** *uma parte importante dos problemas de saúde mental em países em desenvolvimento pode ser atribuída à violência. Portanto, intervenções voltadas para a redução da violência poderiam ter um impacto significativo na redução de problemas de saúde mental nesses países.*

Descritores: *Violência; Transtornos mentais; Estudos transversais; Estudos de coortes; Revisão*

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Introduction

Violence is a complex phenomenon involving individuals, interpersonal relationships, communities, and society.[1] Violence has become a major public health issue over the past decades, since it has been found to be an important cause of mortality and morbidity worldwide. According to the World Health Organization (WHO),[2] more than 1.6 million people died in 2000 as a result of violence. More than 90% of these deaths occurred in low and middle-income countries (LAMIC). Violence rates are particularly high in the Americas, where the average rates of homicide for the years 2000-2004, estimated at 17.8 homicides per 100,000 inhabitants[3] was the highest in the world. In this region, in 2001, three countries (Brazil, Colombia, and Mexico) accounted for 82% of all homicides.[4]

Homicide rates represent just a small part of the societal cost of violence. In the Region of the Americas, it has been estimated that 14% of the gross national product (GNP) is lost or transferred because of violence, and that about 30% to 60% of all emergency visits to hospitals are due to the same reason.[5] Additionally, violence has been found to be associated with poorer physical health, suicide, mental health problems, reproductive health problems, somatic symptoms, and several medical conditions, such as cancer and ischemic heart disease, either as a trigger or as a risk factor.[1,6] Thus, violence has a dramatic impact on the global burden of disease both directly and indirectly – For instance, in 2000, interpersonal violence ranked 31st in high-income countries, and 21st in LAMIC, as one of the main causes of disability-adjusted life years (DALYs). During the same period, unipolar depressive disorder ranked 1st in high-income countries and 6th in LAMIC – in the Americas, depressive disorder ranked 1st and interpersonal violence ranked 5th.[2,7]

Despite the fact that the burden of disease attributable to violence is higher in LAMIC compared to high-income countries, most of the research on the effects of violence on mental health has been carried out in the United States and other high-income countries. This article aims to review the epidemiological evidence on the prevalence of exposure to violence and its relationship with mental health problems in LAMIC. It focuses on the types of violence most commonly studied, the magnitude of the exposure to violence, and its consequences to public and individual mental health.

Method

We assessed the scientific literature on the relationship of violence with mental health problems through online databases. Initially, we carried out a search in the Medline database, using the Medical Subject Headings – MeSH (www.ncbi.nlm.nih.gov/mesh?itool=sidebar). The MeSH terms imputed in the search expression were "violence" and "mental disorders". The search was limited to "cross-sectional" or "cohort studies" published until 09/07/2009, either in English, Spanish or Portuguese. Secondly, the same search was performed in the Embase and Psycinfo databases through the Ovid SP (http://ovidsp.ovid.com) database, and then in the Latin American and Caribbean Health Sciences Literature database (Lilacs) – through the Virtual Health Library (www.bireme.br), and the Brazilian Scientific Electronic Library – SciELO (www.scielo.br). Additionally, the authors searched for articles publish in languages others than English, Spanish and Portuguese using the same strategies. We found a total of 2,156 articles as a result of this search strategy.

The selection of the articles to be included in this review was based on the following criteria: firstly, studies should assess both exposures to violence and any mental health problems either as a dependent or an independent variable. Secondly, they should have a cross-sectional or a cohort design. Qualitative studies and case reports were excluded, and case-control studies were included provided both study group and control group had been drawn from a population-based sample. References of literature reviews were screened to identify articles missed out in our search. Thirdly, studies should have a representative population-based sample. Studies on specific groups such as war veterans, psychiatric inpatients, rescue workers and refugees were also excluded. Studies with a representative sample of children in primary school were included, as it is compulsory in many countries for children to attend school.

The articles included in the review were grouped into two categories according to the World Bank classification: studies from high-income or LAMIC.[8]

Results

A total of 233 articles fulfilled the inclusion criteria. The majority of the articles were from high-income countries, 89 were from the United States alone. The 32 articles from LAMIC were drawn from 25 cross-sectional studies carried out in 19 countries as displayed in Table 1.

As can be seen in Table 1, there were eight studies whose samples were composed of children and adolescents/young adults.[9-16] Domestic violence was the type of violence most commonly assessed, followed by community/urban violence, war-related violence, and sexual violence. In one of the six studies that assessed community/urban violence, this variable referred to violence experienced in the school environment.[12] The mental health outcomes addressed in these studies were suicidal behaviour, alcohol and drugs misuse, common mental disorders (CMD),[13] and depression and post-traumatic stress disorder.[15] Six out of the eight studies assessed mental health problems,[10,11] internalizing and externalizing behaviour[9,12,14] and psychiatric symptoms.[16]

In ten studies, samples were comprised only by women.[17-31] These studies assessed predominantly intimate-partner violence,[17-21,25,28-30] sexual violence,[26,29] domestic violence,[27,31] war-related traumatic events,[26] and occupational violence.[22-24] The outcomes assessed were mental health problems, including emotional distress[25] and psychiatric symptoms,[26,31] alcohol and drugs misuse,[23,27] CMD,[21,28] depression and suicidal ideation.[30]

The remaining seven studies sampled the general population, and either approached sexual violence alone[32] or combined with domestic and community violence,[33-36] and war-related traumatic events.[37-40] Post-traumatic stress disorder (PTSD) and CMD were the main outcomes of most of the these studies.

1. Domestic violence and children's mental health

According to Bordin et al., 20% of poor urban Brazilian children and adolescents have been exposed in the past 12 months to domestic violence consisting of severe physical punishment by one of the parents. The same study states that 18.8% of the children and adolescents have ever witnessed marital conflict.[9] One study carried out in a different urban Brazilian area[12] found that 63.9% of the 6 to 13 year-old boys and 53.2% of the 6-13 year-old girls were exposed to severe violence perpetrated by their mothers; that 42.4% of the boys and 44% of the girls experienced violence at school; and that 31.5% of boys and 21.6% of girls suffered violence in the community. The authors point out that boys are significantly more likely to suffer violence both at home and in the community. According to Pillai et al. adolescents and young adults (16 to 24 year of age) are also exposed to significant levels of

Table 1 - Studies on violence and mental health problems in low and middle-income countries

Study	Country	Subjects	Violence type	Mental health problem
Bordin et al. (2009)	Brazil	6-17 year-old children	Domestic violence	Internalizing problems Externalizing problems
Fleitlich et al. (2001)	Brazil	7-14 year-old Children	Domestic violence	Mental health problems
Paula et al. (2008)	Brazil	11-14 year-old children	Witnessing domestic and urban violence	Mental health problems
Avanci et al. (2009)	Brazil	6-13 year-old children	Domestic violence Community violence	Internalizing behavior
Pillai et al. (2009)	India	16-24 year-old youths	Domestic violence Violence at school Sexual violence	Suicidal behavior Alcohol use Probably CMD
Barbarin et al. (2001)	South-Africa	5 year-old children	Domestic violence Community violence Political violence	Psychological functioning
Qouta et al. (2003)	Palestine	6-16 year-old children	Military violence	PTSD symptoms
Goodman (2005)	Russia	7-14 year-old children	Witnessing marital violence	Psychiatric diagnostic
Ramiro et al. (2004) Jeyaseelan et al. (2004) Illanes et al. (2007) Vizcarra et al. (2001)	Chile Egypt India Philippines	Women aged 15 to 49 years	Intimate-partner violence	Mental health status
Ludemir et al. (2008)	Brazil	15-49 year-old women	Intimate-partner violence	Common mental disorders
Alonso et al. (2006) Musayon et al. (2006) Alonso et al. (2005)	Brazil Mexico Peru	18-60 year-old women	Occupational violence	Alcohol consumption Illegal drug consumption
Valladares et al. (2005)	Nicaragua	Pregnant women	Intimate-partner violence	Emotional distress
Bartauer et al. (1999)	El Salvador	18-70 year-old women	Sexual violence War related TE	Psychiatric symptoms
Ackerson et al. (2007)	India	Ever-married 15-49 year-old women	Domestic violence	Tobacco consumption
Patel et al. (2006)	India	18-45 year-old women	Intimate-partner violence Violence from others	Common mental disorders
Naved et al. (2008)	Bangladesh	14-49 year-old women	Intimate-partner violence Sexual violence before 15	Suicidal ideation
Tadegge et al. (2008)	Ethiopia	Ever-partnered women of reproductive age	Sexual violence Intimate partner violence	Mental distress Suicidal ideation Depression
Simsek et al. (2003)	Turkey	15-49 year-old women	Domestic violence	SCID-I mental disorders
Pederson et al. (2008)	Peru	15 years and over General population	Conflict-related violence	Common mental disorders
Norris et al. (2003) Baker et al. (2005)	Mexico	18-92 year-old general population	Domestic violence Sexual violence Community violence	Post-traumatic stress disorder
Medina-Mora Icaza et al. (2005)	Mexico	18-65 year-old general population	Domestic violence Sexual violence Community violence	Post-traumatic stress disorder
Zlotnick et al. (2006)	Chile	15 years and over general population	Domestic violence Sexual violence Community violence	Post-traumatic stress disorder
Roberts et al. (2008)	Uganda	18 years and over adult population	War-related traumatic events	PTSD and depression
De Jong et al. (2003) De Jong et al. (2001)	Algeria Cambodia Ethiopia Palestine	16-65 year-old general population	Violence related to armed conflict	PTSD and CMD
Luo et al. (2008)	China	20-64 year-old general population	Childhood sexual contact	Sexual problems Psychological distress

violence: among the youth living in rural and urban areas in India, 4.2% were physically abused by their parents, and 5.2% suffered physical abuse from teachers or peers in school during the past three months.[13] The lifetime prevalence of sexual abuse in this same population was 13%.

Table 2 shows the association of exposure to violence and mental health problems among children and adolescents/young adults. According to a Brazilian study,[11] the odds ratio for any mental health problem was twice as high among children who had witnessed domestic and/or community violence than among those who had not. Bordin et al. explored the association of domestic violence, consisting of severe physical punishment, with internalizing and externalizing problems through multivariate logistic regression.[9] The authors found that domestic violence remained correlated with externalizing problems (OR = 9.5, 95% CI = 3.4-26.2) and with externalizing problems combined with internalizing problems (OR = 2.7; 95% CI = 1.2-5.7), either as an independent factor or interacting with other correlates such as age, mother with depression/anxiety symptoms and lack of a residing father.

Finally, the odds ratio for suicidal ideation among Indian youth was 5.3 higher among those exposed to physical abuse and 8.3 higher among those who reported a lifetime sexual abuse than among youth who were not exposed to violence.

2. Violence against women and its effect on women's mental health

As displayed in Table 3, exposure to violence is a common feature of women living in LAMIC. A multi-country cross-sectional study[17,18] found that the lifetime prevalence rates of physical intimate-partner violence were 24.9% in Chile, 11.1% in Egypt, 21.1% in Philippines and from 31% to 43.1% in the three Indian cities studied. The same study found that the proportion of women who reported being victims of psychological violence perpetrated by their intimate-partner was 50.7% in Chile, 10.5% in Egypt, 19.3% in the Philippines, and from 24.7% to 50.1% in India. Another study carried out in India with a national representative sample found that 19% of the women reported that they have been experiencing domestic violence since the age of 15. In 85% of the cases, domestic violence was perpetrated by an intimate-partner. In a catchment area in Goa, India, Patel et al. found that 14.8% of women aged 18 to 45 years reported being victims of husband verbal abuse; 9.4% reported husband physical abuse; and 5.4% reported husband sexual abuse.[28] Moreover, 5.4% reported violence perpetrated by someone other than their husbands.

Prevalence rates of violence against women were also high in Brazil, Ethiopia and Turkey. Ludemir et al.[21] reported that a half of Brazilians 15-49 year-olds ever-partnered women suffered some form of intimate-partner violence during the course of their lives. In Ethiopia, 48% of women of reproductive age reported a lifetime experience of physical, sexual and/or emotional violence,[30] and in Turkey 35.1% of the 15-49 year-old non-pregnant women experienced some form of domestic violence, 29.2% reported suffering verbal violence, and 34.8% economic violence,[31] that is, depriving someone of financial and other material resources in order to maintain control over he or she.

Pregnant women in Nicaragua also reported high rates of spousal violence: fifty-four percent of them reported having been victims of any act of violence during the course of their lives, whereas 32% reported any victimization during their current pregnancy. The lifetime prevalence of physical and sexual violence was 31% and 15%, respectively among these women. During the current pregnancy, 13% of them reported suffering physical abuse, and 7% reported sexual victimization.[25] Moreover, women from LAMIC can be victims of violence in their workplace: a multi-country cross-sectional study found high prevalence rates of occupational violence among working women in Mexico (16%), Peru (24%) and Brazil (39%).[23]

As can be seen in Table 3, violence against women correlated with several mental health problems across countries. The odds ratios of depression and anxiety symptoms in Chile were 3.2 times higher among women who were exposed to psychological violence, and 9.7 among victims of sexual violence when compared to women who were not exposed to violence. In Brazil, the odds ratio for common mental disorders was two times higher among victims of physical and psychological intimate-partner violence when compared to women who did not report intimate-partner violence. Intimate partner violence also correlated with common mental disorders in India – compared to non-abused women, the odds ratios were 3.3 for victims of psychological intimate-partner abuse, 3.5 for physical intimate-partner abuse and 4.4 for sexual abuse.[28] Additionally, intimate partner violence correlated with high emotional distress

Table 2 - Correlation of mental health problems with exposure to violence among children and adolescents/young adults in low and middle-income countries

Study	Site	Age	Gender	Mental health outcome		Type of violence	Adjusted O.R. (95% Ci)
				Type	Prevalence		
Bordin et al. (2009)	Brazil	6-17 years	Both genders	Internalizing problems only	19.2%	Domestic violence	0.6 (0.2 -1.6)
				Externalizing problems only	6.9%		9.5 (3.4 -26.2)
				Internalizing and externalizing	10.8%		2.7 (1.2-5.7)
Paula et al. (2008)	Brazil	10-14 years	Both genders	Any mental health problem	12.5%	Domestic/community violence	2.2 (1.1 -4.2)
Avanci et al. (2009)	Brazil	6-13 years	Female	Internalizing problems	9.8%	Domestic/community violence	NG
			Male		11.1%		
Pillai et al. (2009)	India	16-24 years	Both genders	Suicidal ideation	3.9%	Physical abuse	5.3*
						Sexual abuse	8.3*

CI = confidence interval; NS = non significant; NG = not given
** p < 0.05*

Table 3 - Correlation of mental health problems with exposure to violence among women in low and middle-income countries

Study	Site	Age	Mental health outcome		Type of violence	Adjusted O.R. (95% Ci)
			Type	Prevalence		
Illanes et al. (2007)	Chile	15-49 years	Depression/anxiety symptoms	40.7%	Psychological violence	3.2 (1.8-5.8)
					Sexual violence	9.7 (1.9-51.2)
					Childhood parental violence	1.6 (0.9-2.8)
Ludemir et al. (2008)	Brazil	15-49 years	Common mental disorders	34.5%	Physical IPV alone	1.9 (1.2-3.0)
					Psychological IPV alone	2.0 (1.5-2.6)
					Sexual IPV	1.8 (0.9-3.6)
Alonso-Castillo et al. (2006)	Brazil	18-60 years	Alcohol hazardous drinking	11%	Occupational violence	NG
			Drug consumption	0%		
	Mexico		Alcohol hazardous drinking	3.0%		NG
			Drug consumption	5%		
	Peru		Alcohol hazardous drinking	18.4%		NG
			Drug consumption	6%		
Valladares et al. (2005)	Nicaragua	NG	Emotional distress (high)	40%	Intimate partner violence	2.6 (1.7-3.9)
Barthauer et al. (1999)	El Salvador	18-70 years	Psychiatric symptoms	45.8%	Sexual violence	NG
Patel et al. (2006)	India	18-45 years	Common mental disorders	6.6%	Emotional intimate-partner abuse	3.3 (2.2-4.9)
					Physical intimate-partner abuse	3.5 (2.2-5.6)
					Sexual intimate partner abuse	4.4 (2.4-8.1)
					Violence from others	2.8 (1.7-4.7)
Naved et al. (2008)	Bangladesh (rural)	15-49 years	Suicidal ideation	11%	Sexual violence before the age of 15	5.7 (1.4-22.5)
					Severe physical IPV	4.1 (2.1-8.0)
					Emotional IPV	2.3 (1.2-4.3)
					Sexual IPV	1.0 (0.5-1.8)
	Bangladesh (urban)	15-49 years	Suicidal ideation	15%	Sexual violence before the age of 15	1.7 (0.6-4.4)
					Severe physical IPV	2.2 (1.1-4.5)
					Emotional IPV	2.6 (1.4-4.8)
					Sexual IPV	1.2 (0.7-2.3)
Tadegge et al. (2008)	Ethiopia	Reproductive age	Mental distress	NG	Emotional abuse	2.4 (1.5-3.6)
					Physical abuse	3.5 (2.3-5.4)
					Sexual abuse	3.8 (2.5-5.9)
Simsek et al. (2003)	Turkey	15-49 years	Any SCID-I mental disorders	25.9%	Domestic violence	2.0 (1.2-4.3)

CI = confidence interval; NS = non significant; NG = not given
** p < 0.05*

(OR = 2.6) in Nicaragua,[25] and with suicidal ideation in Bangladesh.[30] Finally, Alonso-Castillo et al.[23] found occupational violence to be one of the predictors of alcohol misuse among working women in Mexico, Peru and Brazil.

3. Association of violence with mental disorders in the general population

Most of the studies on the general population were designed to assess the prevalence of PTSD disorders.[33-36,38-40] Thus, they measured exposure to violence through instruments specifically designed to assess exposure to traumatic events that can lead to the development of PTSD according to standardized diagnostic criteria. Three of these studies addressed war-related traumatic events in populations exposed to armed conflict and political violence.[37-40]

Table 4 shows the distribution of traumatic events in the general population. A high proportion of the population experienced stressful traumatic events. In the Mexican general population, 68% of the population reported having experienced at least one lifetime traumatic event.[35] The prevalence of exposure to violence in this population was 34%.[33] There are remarkable gender differences in the patterns of exposure to traumatic events: whereas the prevalence rates of sexual and intimate partner violence were higher among women than men, events such as witnessing someone being killed or injured, witnessing slaughter or massacre, suffering life-threatening accidents and physical violence from someone other than family members or intimate-partner, being physically assaulted with and without weapon, being kidnapped or tortured and injuring or killing someone accidentally were more common among men.[34-36] In the three studies carried out in post-conflict regions, the proportion of people exposed to violence was massive: whereas virtually the entire population had suffered at least one lifetime violent experience in the Peruvian Highlands and Uganda,[37,40] the prevalence rates of violent victimization was 92% in Algeria, 81% in Cambodia, 79% in Ethiopia and 59% in Palestine.[38]

Table 5 shows the association of violence with PTSD and CMD in the general population. Compared to other traumatic events, violence was associated with the highest conditional risk for PTSD, i.e. the probability of developing the disorder among those exposed to traumatic events.[41] Both in the Mexican and Chilean studies, the highest prevalence rates of PTSD were those related to persecution/harassment, sexual violence, kidnapping and parental violence.[34-36] These studies also found a dose-response relationship between the

Table 4 - Lifetime prevalence of trauma exposure in the general population

Event	Mexico		Mexico		Chile	
	Norris et al. (2003)		Medina-Mora Icaza et al. (2005)		Zlotnick et al. (2006)	
	Women (%)	Men (%)	Women (%)	Men (%)	Women (%)	Men (%)
Traumatic bereavement/death of close person	36.1	40.5*	28.3	25.3	1.8	3.4
Witnessing someone being killed/injured	26.3	45.6*	10.4	22.7*	12.1	15.7*
Witnessing slaughter/massacre	-	-	0.1	0.9*	-	-
Life-threatening accident	21.9	45.1*	14.7	28.7*	4.7	13.3*
Physical assault	13.5	27.8*	-	-	6.0	9.7
Being threatened with weapon	8.3	28.3	15.2	34.8*	2.6	3.3
Sexual molestation	10.5	9.2	9.3	1.2*	-	-
Sexual assault/rape	3.9	0.3*	6.3	1.3*	3.8	1.0
Domestic violence	-	-	21.8	18.5	-	-
Parental physical violence	-	-	18.4	18.1	-	-
Intimate-partner physical violence	-	-	10.7	0.8*	-	-
Physical violence by others	-	-	3.2	12.1*	-	-
Natural/human-made disaster	7.7	9.0	12.8	14.7	5.6	8.0
Fire	5.9	6.2	-	-	-	-
Combat	1.1	3.2*	0.5	1.5	0.1	0.7*
Torture or terrorism	0.3	1.1*	-	-	-	-
Kidnapping	-	-	0.7	3.8*	-	-
Injuring or killing someone accidently	-	-	0.4	2.2*	-	-
Injuring or killing someone intentionally	-	-	0.2	0.6	-	-
Event with a loved one	22.0	22.9	3.7	3.2	-	-

** p < 0.05*

degree of exposure to violence and the severity of PTSD. Norris et al. found that 7% of the adults with a single trauma met PTSD criteria, whereas 23% of those with four or more traumatic events developed the disorder.[34] The authors concluded that the number of traumas was highly predictive of both PTSD and chronic PTSD. Studies carried out in post-conflict settings corroborate these findings. Besides finding a significant linear association between the number of traumatic events and PTSD symptoms, these studies have found that common mental disorders also correlates with recurrent exposure to violence.[37,40]

Discussion

The main purpose of this article was to review the epidemiological literature on the prevalence of exposure to violence and its association with mental disorders in LAMIC. In our review, we have found three clearly different groups of studies divided according to their target population: children and adolescents/young adults, women, and general population.

Children and adolescents surveyed were exposed to high levels of violence at home. This may be explained by the fact that corporal punishment is still socially and legally accepted in many countries, particularly in LAMIC, thus remaining very common.[2] In this review, exposure to violence was significantly associated with mental health problems among children and adolescents, mainly when combined with other social and familial disadvantages such as poverty and maternal CMD. Among all mental health problems assessed, externalizing problems was the most significant outcome associated to violence against children and adolescents. Several studies have shown that externalizing problems lead to functional impairment, besides being one of the most important risk factors for several mental disorders during childhood and later in life. Moreover, there is evidence that children with externalizing problems tend to develop into violent adults.

We have found ten studies on violence against women. All of them addressed violence perpetrated against women by their intimate-partners and/or other family members. The studies showed that women living in low and middle-income countries are at great risk of victimization both at home and at their workplace. One possible explanation is the fact that most LAMIC are conservative and patriarchal societies which reinforce gender inequality.[42] Women are subject to all kind of violence by their intimate-partner: psychological, physical, sexual and economic. All of these forms of intimate partner violence were found to be associated with common mental disorders, alcohol and drug misuse and suicidal ideation. Women's victimization occurs at any time of their lives, including during pregnancy. Besides having deleterious effects over women's mental health, violence during pregnancy generates an additional burden to public health, as it has been found to be independently associated to neonatal outcomes such as low birth weigh.[43] Moreover, as maternal CMD has been consistently found to be one of the risk factors for children's mental health problems,[9,10] and victimization correlates with mental disorders among women, one may conclude that violence against women indirectly correlates with mental health outcomes among children and adolescents.

Studies conducted with the general population predominantly focused on PTSD Differently from studies on children and women, which addressed specific types of violent victimization, these studies assessed exposure to violence amongst other potentially traumatic events. Thus, they provide an opportunity to compare the effects of violence to that of other harmful experiences. First of all, there are remarkable gender differences in exposure to traumatic events: whereas women reported being victims of violent events perpetrated by a close person such as family members and/or intimate partners, men are more exposed to traumatic events that usually occur in the community i.e., accidents, being threatened with a weapon, witnessing someone being killed or injured, etc. Overall, studies have found that men experience more traumatic events than women. However, when exposed to traumatic experiences, women tend to develop more mental health problems as a result. Several hypotheses have been proposed to explain gender differences in

Table 5 - Correlation of mental health problems with exposure to violence in the general population in Low and middle-income countries

Study	Site	Age	Gender	Mental health outcome		Type of violence	Adjusted O.R. (95% CI)
				Type	Prevalence		
Pederson et al. (2008)	Peru	≥ 14 years	Both genders	Depression/anxiety	38.6%	Political violence	NG
				Post-traumatic stress disorder	24.7%		
Norris et al. (2003) Baker et al. (2005)	Mexico	18-92 years	Both genders	Post-traumatic stress disorder	11.5%	Sexual violence Community violence Armed conflict	NG
Medina-Mora Incaza et al. (2005)	Mexico	18-65 years	Both genders	Post-traumatic stress disorder	1.45%	Domestic violence Sexual violence Community violence Armed conflict	NG
Zlotnick et al. (2006)	Chile	≥ 15 years	Both genders	Post-traumatic stress disorder	4.4%	Sexual violence Community violence Armed conflict	NG
Roberts et al. (2008)	Uganda	≥ 18 years	Both genders	Post-traumatic stress disorder	54%	Health insecurity Sexual violence Food insecurity Murder of friends/relatives Torture Witnessing anyone being murdered	2.0 (1.5-2.5) 1.7 (1.0-2.8) 1.6 (1.0-2.4) NS 1.4 (1.1-1.8) 1.4 (1.0-1.9)
				Depression	67%	Health insecurity Sexual violence Food insecurity Murder of friends/relatives Torture Witnessing anyone being murdered	2.0 (1.5- 2.6) NS 1.6 (1.1-2.6) 1.5 (1.1-2.2) 1.4 (1.0-1.9) NS
De Jong et al. 2003	Algeria	16-65 years	Both genders	Post-traumatic stress disorder	37.4%	Armed-conflict relates violence	3.1 (1.8-4.7)*
				Common mental disorders	60.5%		1.8 (1.4-2.1)*
	Cambodia			Post-traumatic stress disorder	28.4%		3.5 (1.8-6.1)*
				Common mental disorders	53.4%		1.4 (1.1-1.8)*
	Ethiopia			Post-traumatic stress disorder	15.8%		4.5 (2.5-7.7)**
				Common mental disorders	23.6%		3.3 (2.2-4.8)*
	Palestine			Post-traumatic stress disorder	17.8%		10.0 (5.3-16.7)*
				Common mental disorders	29.1%		3.6 (2.6-4.5)*
Lou et al. (2008)	China	20-64 years	Female	Psychological distress	NG	Childhood sexual contact	2.9 (1.2-7.1)
			Male				1.9 (1.1-3.3)

CI = confidence interval; NS = non significant; NG = not given
** Risk Ratio*
*** p < 0.05*

depression and anxiety symptoms, including biological factors[44] such as brain structure and function, genetic transmission, and reproductive function, as well as environmental factors such as social disadvantage,[4] childhood familial environment and adverse experience, social roles and cultural norms, and adverse life events.[45,46] Some authors have hypothesized that part of the gender differences on PTSD and CMD may be explained by the fact that women are more exposed to the most pathogenic experiences, such as domestic and sexual violence.[47,48] Norris et al., for instance, have found that 53 out of 1,000 Mexicans had developed PTSD as a result of sexual violence.[34] According to the authors, whereas 34% of those who suffered sexual violence had PTSD, only 1% of those who witnessed someone being killed or injured developed the disorder.

It is important to point out that the search strategy carried out in this review, i.e., based on papers indexed in Medline and other scientific electronic databases can be considered to be rather restrictive. By searching only for indexed scientific articles, we may have not included other potentially existing materials such as dissertations and theses on this subject. The main international databases provide access to peer-reviewed articles, which should guarantee minimal quality standards. However, this procedure may lead to a publication bias, as studies that find interesting results are more likely to be published than those whose results do not confirm a hypothesis and the literature evidence.[49] Moreover, by limiting the search to articles published in English, Spanish and Portuguese, this review may have increased the probability of including papers from certain specific regions. Researchers from high-income countries, particularly from the United States, tend to publish their papers in English, whereas it may be difficult for researchers from the LAMIC's to produce and publish their work in English. By including Spanish and Portuguese languages in the search syntax, we intended to increase the chance of finding papers from the Latin America and the Caribbean regions, where violence rates are particularly high.

Additionally, we tried to minimize the "language bias" by repeating the same search in languages other than the three initially included.

There was an important variation on the methodology used in the different studies, thus making comparisons difficult. For instance, there were studies that reported different outcomes even though the same instrument had been applied to the same target population, as was the case of *depressive behaviour*[12] and *internalizing/externalizing problems,*[9] both based on the Child Behaviour Checklist (CBCL).

Our review has demonstrated that, no matter the population group addressed, exposure to violence is highly prevalent in LAMIC and it is consistently associated with mental disorders. In this article, children and women emerge as the more vulnerable victims of violence. At the same time, parents and intimate-partners were found to be the main perpetrators. Both findings suggest that, in low and LAMIC, there are cultural and social factors that legitimate the use of violence either as a disciplinary tool or as a means for males to retain their power. Thus, both victims and perpetrators should be the target of specific prevention programs. Studies estimating the magnitude and impact of exposure to community violence, mainly among young men are still lacking. Whereas children and women are exposed to high rates of domestic violence, men are exposed to high levels of violence in the community. The World Report on Violence and Health, for instance, states that homicide is a leading cause of death worldwide among those aged 15-44 years and suggests that being male is an important risk factor for becoming a homicide victim.[2]

As the studies included in this review used a cross-sectional design, it remains unclear if there is a causal relationship between the two phenomena. Some authors state that violence is a predictor of mental disorders,[23,31] whereas others argue that mental health problems may be a risk factor for becoming a victim of violence. Fleitlich et al., for instance, hypothesize that children's behavioural problems may evoke maternal depression and severe physical punishment.[10] In the World Studies of Abuse in the Family Environment, poor mental health status was found to be both a risk factor for and a consequence of domestic violence.[18]

Future research on the association of violence with mental disorders in LAMIC should apply prospective study designs in order to elucidate the temporal relationship between exposure to violence and development of mental health problems, and to test whether there is a bidirectional relationship between these two phenomena. Other research strategies such as genetic studies should also be applied in order to acquire a better understanding of the pathways through which violence may affect mental health. Further research should also aim at identifying resilience factors that protect against the development of mental health problems after exposure to violence.

The results obtained support the idea that violence is a major public health concern and that a substancial part of the mental health problems found in LAMIC may be attributed to violence. Thus, interventions directed to decrease violence in LAMIC might have a major positive impact on the mental health of those living in these settings.

Disclosures

Writing group member	Employment	Research grant[1]	Other research grant or medical continuous education[2]	Speaker's honoraria	Ownership interest	Consultant Advisory board	Other[3]
Wagner Silva Ribeiro	UNIFESP	-	-	-	-	-	CNPq† CAPES‡
Sergio Baxter Andreoli	UNIFESP	FAPESP CNPq	-	-	-	-	-
CleusaPinheiroFerri	IoP	Wellcome Trust	-	-	-	-	-
Martin Prince	IoP	Wellcome Trust	-	-	-	-	-
Jair de Jesus Mari	UNIFESP	FAPESP CNPq	-	AstraZeneca	-	-	-

** Modest*
*** Significant*
**** Significant. Amounts given to the author´s institution or to a colleague for research in which the author has participation, not directly to the author.*
Note: UNIFESP = Universidade Federal de São Paulo; IoP = Institute of Psychiatry; King's College London; FAPESP = Fundação de Amaparo à Pesquisa do Estado de São Paulo; CNPq = Conselho Nacional de Desenvolvimento Científico e Tecnológico; CAPES = Coordenação de Aperfeiçoamento de Pessoal de Nível Superior.
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For more information, see Instructions for authors.

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