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perezrh@imp.edu.mx

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Leiner, Marie; Villanos, María Theresa; Puertas, Héctor; Peinado, Jesús; Ávila, Carmen;
Dwivedi, Alok

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Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz
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The emotional and behavioral problems of children exposed to poverty and/or collective violence in communities at the Mexico-United States border: A comparative study

Marie Leiner,^{1,3} María Theresa Villanos,¹ Héctor Puertas,² Jesús Peinado,¹ Carmen Ávila,³ Alok Dwivedi⁴

Original article

ABSTRACT

Background

Collective violence attributed to organized crime has shown to be responsible for a considerable burden of physical and mental health morbidity among youth.

Objective

To compare the emotional and behavioral problems of children exposed to early childhood poverty and/or collective violence in communities at the Mexico-United States border to children exposed to other social and health risks.

Method

A cross-sectional study was carried out with individuals living in poverty at two sites at the Mexico-United States border. Individuals who responded once to the Pictorial Child Behavior Checklist (P+CBCL) in Spanish were selected randomly from clinics in a metropolitan area of El Paso, Texas, United States (poverty alone group), and Ciudad Juárez, Chihuahua, Mexico (poverty plus collective violence group). In addition, emotional and behavioral problems present in these groups were compared with available published emotional and behavioral CBCL scales of children exposed to other social and health risks.

Results

Children exposed to both poverty and collective violence had higher emotional and behavioral problem scores as measured by the P+CBCL than those exposed to poverty alone. In addition, compared with children who were brain-injured, hearing impaired, or whose parents were exposed to drugs or alcohol, the poverty and collective violence group had higher levels of emotional and behavioral problems.

Discussion and Conclusion

Systematic detection and treatment of children as young as 18 months exposed to trauma are necessary to diminish the mental health problems caused by the collective violence attributed to organized crime.

Key words: Health communication, children, collective violence, mental health, poverty, violence, organized crime.

RESUMEN

Antecedentes

La violencia colectiva atribuida al crimen organizado ha mostrado causar considerables daños en la salud mental de jóvenes.

Objetivo

Comparar los problemas emocionales y de comportamiento de niños expuestos a la pobreza y/o violencia colectiva en comunidades localizadas en la frontera México-Estados Unidos, así como con niños expuestos a otros riesgos.

Método

Estudio transversal con participantes viven en la pobreza en ambos lados de la frontera de México y Estados Unidos. Los participantes respondieron a la versión con pictogramas en español del Cuestionario de Comportamientos de Niños (P+CBCL) en clínicas localizadas en El Paso, Texas (grupo expuesto a la pobreza), y en Ciudad Juárez, Chihuahua, México (grupo expuesto a la pobreza + violencia colectiva). De forma adicional se compararon los problemas emocionales y de comportamiento de estos grupos con resultados históricos obtenidos a partir de la evidencia científica.

Resultados

Los niños expuestos a la pobreza/violencia colectiva registraron resultados más altos en las escalas de problemas emocionales y de comportamiento al medirlos con el P+CBCL cuando se compararon con el grupo expuesto solamente a la pobreza. De forma adicional, al comparar los grupos con niños con problemas cerebrales, de audición, o con padres expuestos a drogas y alcohol, el grupo expuesto a la pobreza y a la violencia registró mayores problemas emocionales y de comportamiento.

Discusión y Conclusión

La detección sistemática y el tratamiento de niños desde los 18 meses expuestos a trauma son necesarios para disminuir los problemas mentales causados por la violencia colectiva atribuida al crimen organizado.

Palabras clave: Comunicación en salud, niños, violencia colectiva, salud mental, pobreza, violencia, crimen organizado.

¹ Department of Pediatrics, Texas Tech University Health Sciences Center, El Paso, Texas.

² Jurisdicción Sanitaria de la Secretaría de Salud I, Ciudad Juárez, Chihuahua.

³ El Colegio de Chihuahua, Ciudad Juárez, Chihuahua.

⁴ Division of Biostatistics and Epidemiology, Texas Tech University Health Sciences Center.

Correspondence: Marie Leiner, PhD. 4800 Alberta El Paso, Texas 79905, USA. Tel: (915) 215 - 5831. E-mail: marie.leiner@ttuhsc.edu

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BACKGROUND

Direct (as victims) and indirect (as witnesses) youth exposure to violence has undoubtedly played a role in creating the conditions for the development of many emotional and behavioral problems.¹⁻⁴ Individuals facing these types of victimization experience short- and long-term effects that often have an immediate and sustained impact on their lives. Aggression, depression, anxiety, academic failure, isolation, suicide, running away from home, dropping out of high school, and coming into contact with the criminal justice system during adolescence and adulthood are some of the most prevalent outcomes.⁵⁻¹⁰

A sub-type of direct and indirect violence, known as collective violence, has also been shown to be responsible for a considerable burden of physical and mental health morbidity among youth and adults.¹¹⁻¹⁴ According to the World Health Organization, "collective violence" includes the instrumental use of violence by people that identify themselves as members of a group, which could be transitory or with a more permanent identity, against another group of individuals in order to achieve political, economic, or social gain.¹⁵ Most studies regarding children's exposure to collective violence include the psychosocial effects as a result of violence within the community,¹⁶⁻¹⁹ war, or guerrilla or military conflicts.²⁰⁻²⁵ The effects of direct and indirect victimization related to environmental disasters, acts of terror, genocide, or extreme violence have also been studied.²⁶⁻³²

Lately, collective violence attributed to organized crime has received a high degree of public attention in Mexico with intense media coverage. News about mass murders of men, women, and children, including activists and bystanders, mutilations, and numerous acts of terror, including bombings, kidnappings, torture, and decapitations were broadcast and rebroadcast for days or months by media outlets during the most active years of the drug war (2008-2012).^{33,34} This extraordinary occurrence of stressful events can have a profound effect on children's sense of security, inducing strong feelings of vulnerability and resulting in emotional and psychological trauma, even if these events are only experienced through the media.³⁵⁻³⁷ The threatening, intrusive images of extreme acts of violence presented by the media include frightening images that are usually very intense, portray actual events with acute suffering, and are often presented unedited.^{38,39}

Second-hand victimization via exposure to these events via the media represents a form of indirect trauma and has been shown to affect children's psychosocial, behavioral, and emotional responses even months to years after the exposure took place.⁴⁰ Moreover, viewing media footage of geographically remote events led to posttraumatic symptoms in those children who interpreted the footage as threatening to themselves.³⁸

Likewise, poverty has a devastating effect on mental health and is perpetuated through a cycle in which poverty

cultivates mental illness, while mental illness reinforces poverty.⁴¹ Inequalities due to poverty and low socioeconomic status affect different areas of a child's social life, including their access to education and health care, as well as health status.⁴² As a result, early detection of emotional and behavioral problems may be impeded due to a reduced opportunity to access early intervention efforts. Mental health services, including detection, referral, and treatment are often described as inadequate in those confronted by poverty. Several communication barriers such as culture, linguistic elements, and literacy levels contribute to these disparities.⁴³⁻⁴⁶

Exposure to poverty alone is a risk to the mental health of children,⁴⁷⁻⁴⁹ and poverty with exposure to community violence also has an effect on the mental health of children and adolescents.^{50,51} However, the possible effect of indirect victimization due to collective violence attributed to organized crime has not been extensively studied due to the difficulty of locating an area where one group has been exposed while the other has not. Most studies describe the generalized effects on all children living in an area without a comparison group. In addition, data obtained by standardized measurements are not available.

In this study, a sample of children living in Ciudad Juarez, Chihuahua, Mexico, exposed to both indirect victimization (collective violence attributed to organized crime) and poverty, were compared with children living in El Paso, Texas, United States, exposed to poverty alone. A standardized instrument, the Pictorial Child Behavioral Checklist (P+CBCL), was used to measure emotional and behavioral problems to compare these two groups. When the study was conducted, Ciudad Juarez was considered one of the most violent cities in the world,³³ whereas El Paso had the lowest crime rate in a city with a population of >500 000 residents in the United States.⁵² The number of drug-related killings in the two cities in 2010 was as follows: Ciudad Juarez, 2101 organized crime homicides,⁵³ and El Paso, 0 per 100 000 people.

METHOD

Type of study

This is a cross-sectional study with data collected in 2010 in two border cities in the United States and Mexico.

Participants

A total of 632 participants was randomly included in this study: 316 from El Paso, Texas, United States, and 316 from Ciudad Juarez, Chihuahua, Mexico. Participant information was extracted from electronic records databases maintained during the same period in six university-based clinics in El Paso and nine clinics of the Secretaria de Salud in Mexico.

Database information characteristics

United States electronic information: A large electronic database containing approximately 3000 pediatric patients 18 months to 5 years old whose parents responded to a psychosocial and behavioral assessment known as the Pictorial Child Behavior Checklist (P+CBCL) during non-emergency visits.

Mexican electronic information: Parents/caretakers of children 18 months to 5 years of age responded to the self-response P+CBCL during non-emergency visits, when the children were receiving regular care in these clinics.

Information available in the two databases included date of assessment, gender, age, and total scores of the P+CBCL.

Inclusion criteria

The clinics in El Paso and Ciudad Juarez served mainly low-income Hispanic children. Only children of parents who reported Hispanic ethnicity responded to the P+CBCL questionnaire in Spanish, and those who had a family income below the poverty level were sampled in the United States. The United States site excluded <5% of the patients, with approximately 79% of families enrolled in Medicaid, 16% in the State Children's Health Insurance Program, and 5% without insurance. At the Mexico site, all children were covered by "Seguro Popular", an insurance program provided by the government to those with the lowest income.⁵⁴ Electronic data from the Mexico clinics containing records without identifiers were provided for analysis with authorization from the Secretaria de Salud-Jurisdiccion Sanitaria II ethics committee. The study was also approved by the Institutional Review Board at Texas Tech University Health Sciences Center.

Measurements

The P+CBCL is an adaptation of the original 18 months to 5 years of age CBCL,⁵⁵ which was developed⁵⁶ to support parents with limited literacy. The P+CBCL for ages 1.5 to 5 years is a well-validated questionnaire including items to determine the frequency of behavioral and psychosocial problems in young children. Both externalizing (attention deficit and aggressive behavior) and internalizing (withdrawn, somatic complaints, anxious and depressed, and emotionally reactive) syndromes are obtained as a result of the responses of the parents to the questionnaire. The P+CBCL has been validated with Mexican children.⁵⁷⁻⁵⁹ Additionally, it has demonstrated remarkable consistency in its psychometric properties across more than 30 countries.⁶⁰ For this study, we used society Group 1 for children in the United States and Group 3 for children in Mexico.⁶¹

Different norms are established for children when raw scores from the P+CBCL are converted to T scores. A T score <60 is "normal", and a T score ≥64 is "abnormal". This suggested cut-off point dichotomized "normal" and "clinical"

groups and is able to discriminate between nonreferred and referred children for mental health services.

Additionally, the emotional and behavioral scales obtained for each group were compared with available evidence for children exposed to traumatic conditions or social and health risks.

The data from the El Paso site represent the poverty exposure group while data from the Ciudad Juarez site represent the poverty and violence exposure group. We refer to this exposure variable as a group (United States and Mexico) variable in the study.

Statistical methods

Continuous variables were described using mean and standard deviation (SD), while categorical variables were described using frequency and proportion. The prevalence of behavioral and psychosocial problems obtained using the P+CBCL was also determined and reported. Continuous variables were compared using an unpaired t-test according to the group, while categorical variables were compared using Fisher's exact test. The various scores obtained from the P+CBCL for different components of behavioral and psychosocial problems were compared between groups using an unpaired t-test. The overall group effect was examined using multivariate linear regression analysis after adjusting for gender and age followed by multiple linear regression analyses for each of the outcome scores, separately after adjusting for multiple outcome comparisons. The group effect on each score was presented using adjusted regression coefficient (ARC) with their 95% confidence interval (CI). The scores were non-normally distributed; thus the above analyses were carried out on log transformed scores. Results were consistent; therefore, we only reported results for untransformed scores. All the statistical analyses were performed using SAS 9.3.

RESULTS

The demographic profile and prevalence of psychosocial and behavioral problems according to groups is presented in table 1. There were no apparent differences regarding age and gender between the two groups. The prevalence of borderline and clinical external and internal problems was higher in the Mexico group, but there were statistical differences for all emotional/behavioral problems reported, with the exception of sleeping problems.

Raw P+CBCL scores among the two groups indicate that the Mexico group had higher scores in all problem scales (table 2). When comparing the unadjusted mean raw scores between the United States and Mexico, there were significant differences in all scales, with higher scores reported in Mexico.

Table 1. Demographic characteristics and prevalence of borderline and clinical emotional and behavioral problems according to group

Variables	United States (n=316)	Mexico (n=316)	P-value
Gender, n (%)			0.067
Male	174.0 (55.0)	150.0 (47.0)	
Female	142.0 (45.0)	169.0 (53.0)	
Age (y), mean (SD)	3.2 (1.5)	3.0 (1.3)	0.085
Emotional, n (%)			0.003
Normal	296 (94)	273 (86)	
Abnormal	20 (6)	43 (14)	
Anxious, n (%)			0.002
Normal	298 (94)	275 (87)	
Abnormal	18 (6)	41 (13)	
Sleeping, n (%)			0.842
Normal	304 (96)	302 (96)	
Abnormal	12 (4)	14 (4)	
Withdrawn, n (%)			<0.001
Normal	292 (92)	242 (77)	
Abnormal	24 (8)	74 (23)	
Somatic, n (%)			0.013
Normal	286 (91)	264 (84)	
Abnormal	30 (9)	52 (16)	
Aggressive, n (%)			<0.001
Normal	295 (93)	262 (83)	
Abnormal	21 (7)	54 (17)	
Attention, n (%)			<0.001
Normal	294 (93)	267 (85)	
Abnormal	22 (7)	49 (16)	
External, n (%)			<0.001
Normal	280 (89)	219 (69)	
Abnormal	36 (11)	97 (31)	
Internal, n (%)			<0.001
Normal	273 (86)	226 (72)	
Abnormal	43 (14)	90 (28)	
Total, n (%)			<0.001
Normal	278 (88)	218 (69)	
Abnormal	38 (12)	98 (31)	

SD, standard deviation.

Multivariate regression analysis revealed that the overall Mexico group had higher scores as compared with the United States group after adjusting for gender and age (table 3). Individual scores analyses also demonstrated significant effects of group of the problem scales (emotionally reactive, anxious and depressed, somatic complaints, withdrawn, sleep problems, attention problems, and aggressive behavior).

In addition, significant effects of the group were found in the total scales (internalizing and externalizing problems scales), with higher scores in the Mexico group (table 4). There were significant effects in all the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) scales, including DSM affective, DSM anxiety, DSM pervasive, DSM attention-deficit/hyperactivity disorder (ADHD), and DSM oppositional defiant, with higher scores in the Mexico group (table 5). Age was significantly associated with sleep problems, attention

Table 2. Unadjusted comparison of P+CBCL and DSM scale scores between groups

Variables, mean (SD)	United States (n=316)	Mexico (n=316)	P-value
Emotionally reactive	1.46 (2.05)	2.20 (2.50)	<.001
Anxious depressed	2.22 (2.29)	3.56 (2.63)	<.001
Somatic complaints	1.65 (1.89)	2.47 (2.42)	<.001
Withdrawn	1.39 (1.88)	2.73 (2.69)	<.001
Sleep problems	1.93 (2.28)	2.63 (2.34)	<.001
Attention problems	2.22 (1.83)	3.39 (1.98)	<.001
Aggressive behavior	7.74 (6.89)	13.09 (8.06)	<.001
Internalizing	6.72 (6.54)	10.96 (8.42)	<.001
Externalizing	9.96 (8.22)	16.47 (9.54)	<.001
DSM affective	1.95 (2.22)	3.45 (2.86)	<.001
DSM anxiety	2.89 (2.80)	4.33 (2.82)	<.001
DSM pervasive	2.59 (2.88)	4.28 (3.59)	<.001
DSM ADHD	3.88 (2.90)	5.71 (2.97)	<.001
DSM Oppositional defiant	2.54 (2.46)	4.23 (2.77)	<.001

P+CBCL, Pictorial Child Behavior Checklist; DSM, Diagnostic and Statistical Manual of Mental Disorders; SD, standard deviation; ADHD, attention-deficit/hyperactivity disorder.

problems, and aggressive behavior, while gender was associated with attention and aggressive behavior problems. These scores significantly decreased per unit increase in age. Females had significantly lower scores of aggressive behavior and external problems compared to males. Increase in age significantly reduced the external scores in multiple linear regression analysis, and in the DSM scale, age was only associated with ADHD problems, whereas gender was significantly associated with both pervasive problems and ADHD.

The compiled T scores of children confronting health risks measured using the CBCL scale from several available studies are presented in table 6. Comparison of these available results with the United States and Mexico groups indicates that the Mexico group had equal or higher T scores for most of the scales, with few exceptions (e.g., sleep problems). When compared to children with mild/severe brain injury,⁶² single-suture craniosynostosis,⁶³ parental history of cocaine, alcohol, tobacco, and marijuana exposure,⁶⁴ prenatal cocaine exposure,⁶⁵ maternal current and past depression,⁶⁶

Table 3. Association between the group and P+CBCL scores after adjusting for age and gender

Variables	Overall group effect*	Regression coefficient (95% CI)	P-value
Emotionally reactive	<.001	0.78 (0.43, 1.14)	<.001
Anxious depressed		1.35 (0.97, 1.74)	<.001
Somatic complaints		0.81 (0.47, 1.15)	<.001
Withdrawn		1.38 (1.02, 1.75)	<.001
Sleep problems		0.67 (0.31, 1.03)	<.001
Attention problems		1.17 (0.88, 1.47)	<.001
Aggressive behavior		5.35 (4.19, 6.52)	<.001

* Overall group effect was obtained using multivariate test.

P+CBCL, Pictorial Child Behavior Checklist; CI, confidence interval.

Table 4. Association between the group and two domains of the P+CBCL scale after adjusting for age and gender

Variables	Overall group effect	Regression coefficient (95% CI)	P-value
Internalizing	<.001	4.33 (3.14, 5.52)	<.001
Externalizing		6.53 (5.15, 7.91)	<.001

P+CBCL, Pictorial Child Behavior Checklist; CI, confidence interval.

and hearing impairment,⁶⁷ children in the Mexico group had significantly higher scores for most scales. A smaller number of scales were similar and non-significant when compared with the Mexico group, with a reduced number of higher scales and significant differences in the same group. There were also significantly higher scores in the United States group for some scales, including emotional reactive, anxious depressed, and somatic problems.

DISCUSSION AND CONCLUSION

Crime victimization has been shown to be a major and public problem that increases the risks to victims of suffering from trauma-related disorders, including PTSD, suicide, substance abuse, future criminal behavior, health and social problems, and future poly-victimization.⁶⁸ It has been found that trauma history, including direct victimization, is often not evaluated or treated appropriately. This implies that victims of indirect victimization have even less opportunity for rehabilitation or support services. In addition, studies of the effects of crime victimization, which is considered direct exposure to violence, generally focus on adults, leaving an important gap in the effects of indirect victimization on children.⁶⁹ Some stud-

Table 5. Association between the group and DSM scores after adjusting for age and gender

Variables	Overall group effect	Regression coefficient (95% CI)	P-value
DSM affective	<.001	1.52 (1.12, 1.92)	<.001
DSM anxiety		1.46 (1.02, 1.90)	<.001
DSM pervasive		1.74 (1.23, 2.25)	<.001
DSM ADH		1.84 (1.39, 2.30)	<.001
DSM Oppositional defiant		1.70 (1.29, 3.11)	<.001

DSM, Diagnostic and Statistical Manual of Mental Disorders; CI, confidence interval; ADHD, attention-deficit/hyperactivity disorder.

ies have found that indirect victimization does not predict aggressive behaviors,⁷⁰ and others indicate systematically that aggression is present at short or long term.⁷¹⁻⁷³

There are also key gaps in mental health research related to children from birth to age 5 years, particularly low-income children.⁷⁴ Here, we presented the emotional and behavioral problems confronted by children living in poverty in two different geographic areas at the Mexico-United States border. Children at the Mexican site, in addition to poverty, were subject to collective violence attributed to organized crime and reported higher emotional and behavioral scores than those at the United States site. When compared with other children of the same ages exposed to social and health risks, most of the Mexico group scores surpassed the internalizing or/and externalizing scales. In a previous study examining the same exposure and groups, except with individuals 6-16 years of age, we found that the Mexico site externalizing scale scores were higher than the United States site scores.⁷⁵ However, in the present study, emotional and behavioral scales scores were higher in the

Table 6. Comparison of Mexico and United States T scores with available data in children confronted with social and health risks

	Emotional reactive	Anxious depressed	Somatic	With-drawn	Sleep problems	Attention problems	Aggressive behavior	Inter-nalizing	Exter-nalizing	Total
Mexico	53.99	55.87	55.94	58.48	53.70	56.29	57.38	52.99	54.40	54.61
United States	52.34	52.94	53.62	53.92	52.64	53.32	52.84	46.00	45.86	45.76
Brain injured children (Wetherington et al., 2007)										
Mild	^{2,4} 55.61	^{1,4} 53.71	^{1,3} 52.42	¹ 54.42	^{2,4} 57.39	⁴ 56.23	^{1,4} 56.71	^{1,4} 51.42	⁴ 53.68	⁴ 53.35
Severe	^{2,4} 55.80	¹ 52.90	^{1,4} 54.85	^{2,4} 60.60	^{2,4} 54.60	⁴ 56.90	⁴ 55.35	⁴ 53.70	^{1,4} 51.80	^{1,4} 52.95
Children with single-suture craniosynostosis (Kapp-Simon KA. et al., 2012)										
Mother report	¹ 52.20	^{1,3} 51.90	^{1,3} 52.90	^{1,3} 53.00	^{2,4} 54.60	¹ 53.40	^{1,3} 52.40	^{1,3} 44.40	¹ 47.00	¹ 46.10
Father report	¹ 52.00	^{1,3} 51.60	^{1,4} 52.00	^{1,3} 52.10	¹ 52.30	¹ 52.80	^{1,3} 52.00	^{1,3} 43.40	¹ 45.80	¹ 44.80
Teacher/caregiver report	⁴ 53.60	^{1,4} 54.30	^{1,4} 51.60	^{1,3} 53.00	NA	¹ 53.60	^{1,4} 54.70	^{1,4} 48.40	^{1,4} 52.10	^{1,4} 51.10
Prenatal and recent cocaine exposure								^{1,4} 50.70	^{2,4} 56.20	
Parent's alcohol, tobacco and marijuana exposure (Accornero VH et al., 2002)								^{1,4} 51.30	^{2,4} 56.00	
Prenatal cocaine (Lindhiem, O & M. Dozier, 2007)								⁴ 52.30	⁴ 53.60	
Past mother depression (Dietz LV et al., 2009)								^{1,4} 44.19	^{1,4} 48.81	
Current mother depression (Dietz LV et al., 2009)								^{1,4} 49.46	^{1,4} 50.67	
Hearing impaired children (Barker DH et al., 2009)						^{1,3} 51.71	^{1,3} 51.65	^{1,4} 42.50		

Statistical different ¹Mexico >, ²Mexico <, ³United States >, ⁴United States <, NA, not available.

Mexico group than those in the United States site and also than those in the historical data groups. While poverty was shown to be a risk factor for emotional and behavioral problems for both groups, collective violence exposure may be the cause for the higher risk among the Mexico group.

The amount of published research about the effects of exposure to collective violence is minimal and lacking in longitudinal studies that would allow drawing firm conclusions. This study has limitations, including its retrospective, rather than prospective, character. In addition, due to the nature, frequency, and dissemination of news about the generalized violence in the city, for this study it was assumed that families were indirectly victimized, and specific questions regarding possible individual victimization were not posed.

These questions were not included due to the inability of the researchers to provide specific health care services to the families. This was considered ethical practice despite the possibility of confounding the results. Another limitation includes the possibility that poverty exposure could differ between Mexico and the United States, resulting in different adversity. Many families victimized in Ciudad Juarez had moved to El Paso seeking safety, and there is a remote possibility that these individuals were included in the United States group. Despite these limitations, this study allowed us to compare data using a well-recognized screening assessment with demonstrated consistency in more than 30 countries.⁶⁰ In addition, in an attempt to compare similar populations, data collection included the same time periods in the United States and Mexico with equivalent poverty levels and the largest possible sample size.

Responses of children to indirect exposure to collective violence are determined by individual level risks factors that include socioeconomic status, family context (including parental distress), appropriate child care, personal characteristics, and the severity and amount of exposure.⁷⁶ This article provides information indicating that behavioral problems are displayed with higher frequency among children exposed to poverty and collective violence when compared to children exposed only to poverty. Supportive parenting practices have been found to moderate the risks of exposure to collective violence caused by military conflicts and aggression.⁷⁷ In addition, detection and treatment can have an important impact on the outcome.⁷⁸ Effective systematic detection and treatment of children as young as 18 months exposed to trauma are necessary to diminish the mental health problems caused by the collective violence attributed to organized crime.

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Conflict of interest

No author of this paper has a conflict of interest, including specific financial interests, relationships, and/or affiliations relevant to the subject matter included in this manuscript.

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