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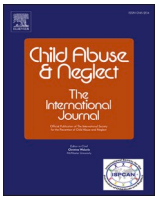

ACE-IQ extended version validation and ACE's frequency in Mexican adolescents

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ABSTRACT

Background: Adverse Childhood Experiences (ACEs) may have short, middle, and long-term consequences on people's development and physical and mental health. There is a need for information on this subject in low- and middle-income countries and a need to reduce recall bias in ACEs research worldwide.
Objective: Hence our objectives were to translate, adapt and validate the Adverse Childhood Experiences extended version and to determine ACEs frequencies in a sample of Mexican adolescents.
Participants and setting: A convenience sample of 5835 schooled Mexican adolescents (age: M = 16.13, SD = 1.32; 61.01 % females) from 20 states in Mexico completed a survey.
Method: A cross-sectional study was conducted with an extended version of the ACE-International Questionnaire (ACE-IQ), which assesses 23 ACEs organized into five categories: situations that cause household dysfunction, exposure to violence, violence from parents or guardians, interpersonal violence, and sociodemographic context.
Results: Evidence of construct validity and reliability of the questionnaire was obtained, and 16 ACEs were included in the final ACE-IQ version. 90 % of adolescents had one or more ACEs. Neglect was the most experienced ACE reported by 73.30 % of the participants, with no significant difference by age, sex, or geographic region.
Conclusion: ACE-IQ questionnaire is a reliable and valid instrument to recommend its use for generating information on ACEs in studies on Mexican adolescents. The results on the frequency of ACEs revealed that 90 % of this schooled Mexican adolescent sample had experienced one or more ACEs, and about a third had experienced six or more.

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1. Introduction

1.1. Adverse childhood experiences (ACEs)

Adverse Childhood Experiences (ACE) are potentially traumatic experiences that may happen to people throughout their development (Boullier & Blair, 2018; Chegeni, Haghdoost, Shahrbabaki, Shahrbabaki, & Nakhaee, 2020; Felitti et al., 1998). These experiences include but are not limited to physical, emotional, and sexual abuse; emotional and physical neglect; exposure to domestic, community, and collective violence; and household dysfunction situations like parental illness or loss, parental separation, substance use, mental health problems or incarceration within the family members (Bellis et al., 2019).

1.2. ACEs consequences

ACEs may occur in different environments, such as family, community, or other social contexts (Kalmakis & Chandler, 2014). It is also known that ACEs cluster since there is evidence that 87 % of the adults who reported an ACE also reported living at least another one (Vink et al., 2019), which is relevant because there is a documented cumulative effect of ACEs on health and social performance of people (Hashemi, Fanslow, Gulliver, & McIntosh, 2021).

ACEs are related to poor long-term physical, mental, and reproductive health (Boullier & Blair, 2018; Chegeni et al., 2020), impaired development of brain structure, function, and connectivity (Teicher, Samson, Anderson, & Ohashi, 2016), cognitive and language development problems (Vink et al., 2019), reduced academic, work and social performance (Joshi, Raina, Tonmyr, MacMillan, & Gonzalez, 2021), suicidality and high-risk behaviors such as substance use, and high-risk sexual behaviors (Chegeni et al., 2020), and a reduction of the life expectancy (Boullier & Blair, 2018; Felitti et al., 1998).

Consequently, it is essential to comprehend Adverse Childhood Experiences (ACEs) about their frequency, factors contributing to their occurrence, and elements that mitigate their impact. This comprehensive understanding of ACEs can guide the development and implementation of effective prevention and intervention initiatives to reduce the burden of diseases and associated healthcare costs (Bellis et al., 2019; Finkelhor, 2018; Wade, Becker, Bevans, Ford, & Forrest, 2017). To do so, it is necessary to have reliable, valid, and culturally neutral measurement tools.

1.3. Measurement instruments for ACEs

There are several tools for measuring ACEs in literature, however many of them have some limitations such as: 1) many of these assessment tools were developed and validated for adult populations to be answered in retrospective designs with the risk for recall-biases (Vink et al., 2019), 2) some of the measures are meant to be answered by parents or guardians, and their responses may not reflect the children's or adolescents' experiences (Borgers, de Leeuw, & Hox, 2000; Vink et al., 2019), 3) not all the assessment tools include questions about all the types of ACEs, focusing only on abuse and neglect (Chegeni et al., 2020; Meinck, Cosma, Mikton, & Baban, 2017; Oh et al., 2018), 4) not all the measurement tools are free or easily accessible (Oh et al., 2018), 5) not all the tools have evidence of their psychometric properties (Chegeni et al., 2020; Meinck et al., 2017; Oh et al., 2018), and 6) some of the tools designed for children and adolescents were developed for clinical use but not for epidemiological research (Vink et al., 2019).

1.4. ACE international questionnaire (ACE-IQ)

One of the most used measures of ACEs is the Adverse Childhood Experiences International Questionnaire (ACE-IQ; World Health Organization WHO, 2012) because it has a culturally neutral design that serves to measure ACEs in several countries, its questions cover family dysfunction, physical, sexual and emotional abuse, and neglect by parents or caregivers; peer violence; witnessing community violence, and exposure to collective violence, it guides its administration, interpretation and ethical considerations to the participants, it is freely accessible, and it has been used in High-, Middle- and Low-Income Countries (Baban, Cosma, Blazsi, Sethi, & Olsavszky, 2013; Raleva, Peshevska, & Sethi, 2013). Although the product has advantages, it was not originally intended for youth. Therefore, there is an opportunity to validate it among this age group using both long and short versions (Chegeni et al., 2020; Ford et al., 2014; Meinck et al., 2017). Alongside the fact that ACEs measurement has been done mainly in high-income countries, there need to be more assessment instruments and information on risk factors from exposure to ACEs in vulnerable children in low- and middle-income countries (Mwashala, Saikia, & Chamberlain, 2022).

Therefore, the objectives of this work were first to translate the ACE-IQ to Mexican Spanish, then adapt and validate it; and second to determine the ACE's frequency in a Mexican adolescent sample.

2. Method

2.1. Design

We developed the questionnaire in two phases: 1) Translation and adaptation of the instrument to Mexican Spanish, and 2) Psychometric validation of the translated and adapted instrument and determination of ACEs frequency in a Mexican adolescent sample. For this phase, an observational, cross-sectional study via an online survey was conducted.

2.1.1. Phase 1. Translation and adaptation of the instrument

We obtained permission from the World Health Organization (WHO) to translate, adapt and validate the original ACE-IQ English questionnaire version (World Health Organization, 2018) to Mexican Spanish and for children and adolescent age groups.

We followed the protocol of translation, adaptation, and validation of instruments or scales for use in cross-cultural health care research proposed by the WHO (World Health Organization, 2021) and the recommendations of the International Test Commission (Hernández, Hidalgo, Hambleton, & Gómez-Benito, 2020; International Test Commission, 2017). It was done in four steps as follows:

1) Two native Spanish speakers with English proficiency translated the questionnaire from English to Spanish.
2) A bilingual expert committee composed of two professionals who specialize in violence against children and three professionals who specialize in adolescent mental health reviewed and reached a consensus on translation.
3) A bilingual, English native speaker who is also an expert in adolescent mental health conducted an equivalence review with the original version.
4) Piloting with 229 adolescents aged 11 to 19, 61 % women, 19.3 % junior high school, 76.8 % high school, and 3.9 % out of school, to verify that the wording, vocabulary, and terminology were adequate. This step was done in person at schools (in a pre-pandemic period) and allowed the generation of the version of the ACE-IQ that was applied in phase two (psychometric validation).

The original translation version was enriched with six other ACEs reported in the literature (Casas-Muñoz et al., 2021; Vink et al., 2019). In this way, the extended Mexican version was generated, which was used to evaluate the psychometric properties in phase two.

2.1.2. Phase 2. Psychometric validation and ACEs' frequency determination in a Mexican adolescent sample

The current study focuses on psychometric evaluation and frequency determination utilizing the adapted and extended instrument generated in phase 1.

2.2. Sample

A nonprobability convenience sampling method was used to invite students from 76 public high schools from 20 out of the 32 states of México.

To ensure representation from all eight of Mexico's geographical regions, a total of twenty states were randomly selected, with an equal number of states from each region. The eight regions are defined based on shared resources and conditions among the states, including natural, historical, economic, and cultural factors (Bassols Batalla, 1992). The number of schools included in the study was calculated using the sample size calculation formula for finite populations, considering a confidence level of 95 %, an error probability of 5 %, and a total universe of 201,033 higher education schools in the country. This calculation resulted in 73 schools. To ensure the necessary number of schools, 80 schools were randomly invited from 20 states, and 76 accepted to participate in the study.

A statistical power analysis was conducted to determine the sample size for psychometric validation based on the Root Mean Square Error Approximation (RMSEA) proposed by MacCallum, Browne, and Sugawara (1996). We considered 47 items, 1128 degrees of freedom, a significance level of 0.05, and a statistical power of 0.80, as recommended in the literature, which resulted in a minimum of 5575 participants.

All students from the selected schools were invited to participate in the survey through the school's social media. Only those who voluntarily registered their information on a platform to participate and provided informed consent were included in the sample. Eight thousand eight hundred ninety-four students were registered, 8626 provided individual assent and parental consent, 7329 opened the survey, and 5836 completed it.

2.3. Participants

Participants were aged between 11 and 19, with a mean age of 16.13 (S.D. = 1.32), 38.99 % (2276) were males, and 61.01 % (3560) were females. By geographic region, participants came from: 29.16 % (1702) Northwest, 1.05 % (61) Northeast, 6.92 % (404) West, 24.19 % (1412) East, 12.15 % (709) Center-North, 7.32 % (427) Center-South, 15.35 % (896) Southwest, and 3.86 % (225) Southeast. Although a minimum of 60 participants per region was ensured, the proportion of participants from each geographical region was not representative of the general population in the country. Therefore, further studies with national representation samples are required, specifically including more participants from the Northeast, West, and Southwest regions.

2.4. Instrument and measures2.3.4.5.

The Mexican Spanish ACE-IQ extended version used for psychometric validation consisted of 47 items in a Likert Type format (this version is available in Spanish in supplementary material). It measures 23 Childhood Adverse Experiences categories throughout life (has this ever happened to you?) and a sociodemographic section. ACEs categories were classified into nine dimensions (italics indicate added ACEs categories in the extended Mexican version):

1. Situations that may cause family dysfunction: 1) living with a household member with problematic alcohol or substance use, 2) living with a household member who was depressed, mentally ill or suicidal, 3) living with a household member who was ever sent to jail or prison, 4) *one or both parents seriously ill*, 5) one or both parents' death, 6) parental separation or divorce.

2. Exposure to violence:7) collective violence, 8) community violence, 9) domestic violence, 10) *physical violence toward the mother*.
3. Violence from parents or guardians: 11) corporal punishment (*spanking*), 12) physical abuse, 13) psychological abuse, and 14) neglect.
4. Interpersonal violence: 15) Sexual abuse, 16) childhood or adolescent marriage, 17) childhood or teenage pregnancy, 18) bullying, 19) physical fights, and 20) *peer isolation or rejection*.
5. Sociodemographic context: 21) *living in a single-parent family*, 22) *living institutionalized (although it is uncommon for schooled participants it was included for the identification on literature* Casas-Muñoz et al., 2021*)*, 23) *Low socioeconomic status*. These questions were asked in sociodemographic section.

Socioeconomic status was determined by AMAI Index (Asociación Mexicana de Agencias de Inteligencia de Mercado y Opinión (AMAI), n.d.). It classifies seven socioeconomic levels (A/B, C+, C, C-, D+, D, and E) based on six indices scores. Level E was considered as low socioeconomic status. It is equivalent to most households (82 %) having a head with no more than elementary education. Seven out of ten homes have only one bedroom and 83 % still need a complete bathroom. Internet possession in the home is very low (0.3 %). More than half of spending is allocated to food (52 %) and only 1 % to education.

The family dysfunction items response options were dichotomous (yes or no). The remaining items response options were four in frequency (many times, few times, once, never), and I don't want to answer.

Based on literature on ACEs in low- and middle-income countries, the extended items were added. The literature suggests that in these countries, there may be more adversities related to socioeconomic and security conditions in comparison to high-income countries (Casas-Muñoz et al., 2021; Liaqat, Hassan, Zeshan, & Naveed, 2021).

It is important to say that the ACEs were asked through questions about the experiences and not directly, for example collective violence were comprised by the questions: The next questions are about organized crime (narcos, zetas, etc.), armed conflicts, genocides (extermination of a social group for racial, political or religious reasons, kidnappings or disappearances and torture. 1. Have you had to move or leave your home due to any of the events? 2. Was your house destroyed or damaged by any of the events? 3. Have you been beaten by the police, army, guerrillas, or criminals? 4. Has any member of your family or friend been killed or beaten by the police, army, guerrillas, or criminals?

2.5. Procedure

Students were invited to participate and register on an online platform through the school's social media. With the online registration data, parental consent was obtained by phone and adolescents' assent at the registration moment. Finally, the link for the online survey site was sent to students. The survey was applied from April to July 2021(during the COVID-19 pandemic period).

2.6. Ethical considerations

This study followed Ethical Research Involving Children's Standards (Graham, Powell, Anderson, Fitzgerald, & Taylor, 2013). Approval and registration were obtained from Institutional Research and Ethics Committees (registration number 60/2019), the Health and Education Ministries of Mexico, federal and local school authorities, parental informed consent, and informed assent from adolescents. The given information was anonymous and kept confidential. To thank and support the participants in answering the survey, they were given a phone recharge of US$5. At the end of the survey, a video and information on an online and telephonic psychological attention service (24/7) were provided for all adolescents.

Adolescents who reported that someone attempted to or had sexual intercourse with them or were abandoned or run out from their home were invited to contact the psychological support service under safe conditions. This procedure was specified in the consent letters for both parents and adolescents.

2.7. Data analysis

Analysis followed four consecutive steps:

1) Item response distribution.

To understand the item response distribution, we performed Royston's multivariate normality test for the items set.

2) Item discrimination and factor structure.

To determine item discrimination and factor structure of the scale, we performed a Confirmatory Factor Analysis (CFA) (Edwards & Wirth, 2009). We selected the Diagonally Weighted Least Squares (DWLS) estimation method, which is appropriate for treating ordinal data with a lack of normality (Li, 2016; West, Taylor, & Wu, 2012). A nine factor model was specified according to previous ACEs category classifications (Bethell et al., 2017). To define the metric of the latent variable, the scale was identified by setting the factor loading of the first item to one (Kenny & Milan, 2012). Analyses were carried out in R software with the lavaan package.

For item discrimination evidence, we looked for a correct relationship between the item and the latent variable that explained it when a lambda value >0.4 was obtained (Whittaker, 2012). For construct validity evidence good global fit of the model was

($\chi^2_{(666)}$ = 4187.65, p < .01; CFI =0.95; RMSEA = 0.03 [CI95% 0.02 to 0.03]; SRMR = 0.06)

(caption on next page)

Fig. 1. Standardized Solution of the Confirmatory Factor Analysis of the ACE-IQ Extended versión in mexican adolescents.
($\chi^2_{(666)} = 4187.65$, $p < .01$; CFI =0.95; RMSEA = 0.03 [CI95% 0.02 to 0.03]; SRMR = 0.06).

considered with the following criteria: A value >*0*.95 in the Comparative Fit Index, a value ≤0.08 on the Standardized Root Mean Square Residual (*SRMS*), and the Root Mean Square Error of Approximation (*RMSEA*) (Li, 2016).

3) Reliability

The reliability was calculated by internal consistency for the total scale (ordinal Alpha and Omega coefficients). These coefficients were selected because they were appropriate for the data type (Trizano & Alvarado, 2016). Analyses were carried out in R software with the psych package.

4) ACEs frequency in a Mexican adolescent sample

Frequencies and percentages (95 % CI) were calculated for each ACE category, overall, by sex, age groups (10 to 14 and ≥15), and for Mexico's eight geographical regions. Age and sex were considered since differences were found in previous literature (Vink et al., 2019). Geographical differences might be expected by historical, economic, and cultural factors and natural resources (Bassols Batalla, 1992).

3. Results

3.1. Item response distribution

Based on the results of the Royston test (score of 345.27 and *p*-value <.01), it was found that none of the item responses followed a normal distribution, as determined by both univariate and multivariate normality tests.

3.2. Item discrimination and factor structure

The CFA results showed the model's global lack of fit to explain the data ($\chi^2_{(783)} = 6467.13$, $p < .01$; CFI =0.92; RMSEA = 0.03 [CI95% 0.03 to 0.03]; SRMR = 0.07). Local items fit using modification indices was analyzed. These Indices showed seven items associated with a lack of local fit. They were eliminated and respecified the model. The modified model showed good global fit ($\chi^2_{(666)} = 4187.65$, p < .01; CFI =0.95; RMSEA = 0.03 [CI95% 0.02 to 0.03]; SRMR = 0.06). Its final structure is shown in Fig. 1.

Table 1
ACEs reported frequency by total, age and sex, in a Mexican adolescent sample.

ACE	Total (n = 5836) %	Male from 10 to 14 years old (n = 44) %	Male from 15 to 19 years old (n = 2292) %	Female from 10 to 14 years old (n = 68) %	Female from 15 to 19 years old (n = 3432) %	$\chi^2_{(3)}$
1. Living with a household member with psychoactive substances use	18.66	11.36	18.5	8.82	19.06	5.72
2. Living with a household member with a mental health problem	15.51	6.82	13.48	16.18	16.96	4.58
3. Living with a household member that has been incarcerated	6.78	0	7.02	10.29	6.64	NA
4. One or both parents seriously ill	19.46	11.36	19.24	22.06	19.67	3.88
5. Parental loss	3.25	4.55	3.71	1.47	2.97	2.69
6. Exposure to collective violence	13.74	6.82	13.61	11.76	13.96	2.78
7. Exposure to community violence	56.63	38.64	58.2	61.76	55.71	5.74
8. Exposure to domestic violence	36.08	13.64	32.33	27.94	39.04	11.77**
9. Exposure to physical violence toward the mother	9.83	2.27	9.03	5.88	10.55	6.57
10. Corporal punishment (spanking)	23.93	9.09	26.35	16.18	22.67	9.35*
11. Physical abuse	30.72	11.36	32.16	19.12	30.24	12.60**
12. Psychological abuse	37.31	11.36	32.07	30.88	41.26	16.72**
13. Neglect	73.35	65.91	70.77	77.94	75.09	1.11
14. Sexual abuse	18.91	6.82	12.35	14.71	23.54	10.55**
15. Bullying	29.52	15.91	25.7	22.06	32.4	5.66
16. Physical fights	24.09	34.09	37.35	10.29	15.38	22.75**

Own elaboration.
* p < .05.
** $p < .01$.

3.3. Reliability

Ordinal coefficients alpha (ordinal alpha = 0.88) and omega (ordinal omega = 0.91) showed good internal consistency values for the scale's reliability.

3.4. ACEs frequency

For all participants (Table 1), the most commonly reported ACE category was neglect (73.35 %), followed by exposure to community violence (56.63 %), and the least reported was parental loss (3.25 %).

There were differences in some ACEs categories when comparing by sex and age, (Table 1). The exposure to domestic violence ($\chi^2_{(3)} = 11.70$, $p < .01$) was reported more frequently by older females. Younger men reported lower corporal punishment (spanking) ($\chi^2_{(3)} = 9.35$, $p < .05$) and psychological abuse ($\chi^2_{(3)} = 16.72$, $p < .01$) frequencies. Physical abuse was more frequent in older women and men ($\chi^2_{(3)} = 12.60$, $p < .01$). For sexual abuse, there were also statistically significant differences ($\chi^2_{(3)} = 10.55$, $p < .01$) with higher frequency for both female groups. For physical fights, there were also statistically significant differences ($\chi^2_{(3)} = 22.75$, $p < .01$) with higher percentages for both male groups.

Considering Mexico's geographic regions, there were no significant differences for any of the reported ACEs, as can be seen in Table 2.

On the cumulative experience of ACEs, only 9.15 % have not experienced any ACE. Regarding the sex and age of participants, no significant differences were found between groups of age and sex within the sample, as shown in Table 3.

On ACEs cumulative experience by Mexico's geographic regions, it can be seen that between 6.22 % and 12.13 % of the participants haven't experienced ACEs without significant differences, as shown in Table 4.

Table 2
ACEs reported frequency by geographic region of Mexico▾.

ACE	Northwest (n = 1702) %	Northeast (n = 61) %	West (n = 404) %	East (n = 1412)	Center North (n = 709) %	Center South (n = 427) %	Southwest (n = 896) %	Southeast (n = 225)	$\chi^2_{(7)}$
1. Living with a household member with psychoactive substances use	17.51	9.84	20.05	18.63	18.76	18.97	19.02	24.89	6.32
2. Living with a household member with a mental health problem	16.98	6.56	16.34	14.66	13.82	19.44	13.06	18.22	6.64
3. Living with a household member that has been incarcerated	9.87	1.64	8.42	5.31	5.78	7.26	4.02	4.44	7.91
4. One or both parents seriously ill	20.56	14.75	17.33	19.83	17.35	18.5	19.64	21.78	2.06
5. Parental loss	3.58	0	2.97	2.48	2.82	3.98	4.02	4	NA
6. Exposure to collective violence	17.98	9.84	14.85	12.89	15.09	10.07	8.93	8	7.14
7. Exposure to community violence	59.05	54.1	58.17	53.26	54.72	63.7	52.46	66.67	3.52
8. Exposure to domestic violence	35.66	19.67	33.17	37.75	33.71	40.89	33.82	45.78	11.27
9. Exposure to physical violence toward the mother	9.11	8.2	7.18	9.77	8.74	14.52	10.49	12.89	4.82
10. Corporal punishment (spanking)	24.09	16.32	23.27	25.92	23.84	30.21	18.3	24.44	3.45
11. Physical abuse	29.79	26.23	30.69	33.57	30.89	37.01	25.11	31.11	3.89
12. Psychological abuse	36.84	27.87	34.65	39.87	36.95	41.69	33.48	40	0.71
13. Neglect	74.68	70.49	73.76	75.99	71.23	74.24	68.08	72.89	3.32
14. Sexual abuse	18.27	14.75	16.56	20.47	17.35	19.44	18.42	25.33	3.32
15. Bullying	30.2	22.95	29.7	30.45	32.02	29.98	23.88	33.78	3.39
16. Physical fights	24.62	29.51	34.65	23.8	22.85	29.98	16.41	24.89	8.76***

Own elaboration.

* $p < .05$.

** $p < .01$.

▾ States included by geographic region: Northwest (Nuevo León), Northeast (Chihuahua, Durango, Sinaloa, and Sonora), West (Jalisco, and Michoacán), East (Hidalgo, Puebla, and Veracruz), Center north (Aguascalientes, Guanajuato, and Zacatecas), Center South (Estado de México, and Ciudad de México), Southwest (Chiapas, and Guerrero), Southeast (Campeche, Tabasco, and Yucatán).

Table 3
Number of ACE reported by total, age and sex in a Mexican adolescent sample.

Number of reported ACEs	Total (n = 5836) %	Male from 10 to 14 years old (n = 44) %	Male from 15 to 19 years old (n = 2292) %	Female from 10 to 14 years old (n = 68) %	Female from 15 to 19 years old (n = 3432) %	$\chi^2_{(3)}$
0 ACEs	9.15	18.18	9.64	5.88	8.77	7.32
From 1 to 3 ACEs	39.17	54.55	39.92	51.47	38.23	4.47
From 4 to 5 ACEs	19.95	11.36	19.46	20.59	20.37	3.35
6 or more ACEs	31.73	15.91	30.98	22.06	32.63	7.42***

Own elaboration.
* $p < .05$.
** $p < .01$.

Table 4
Number of ACE reported percentage by Mexico geographic region.

Number of reported ACEs	Northwest (n = 1702) %	Northeast (n = 61) %	West (n = 404) %	East (n = 1412)	Center North (n = 709) %	Center South (n = 427) %	Southwest (n = 896) %	Southeast (n = 225)	$\chi^2_{(7)}$
0 ACEs	7.58	11.48	8.42	8.07	12.13	7.96	12.9	6.22	4.48
From 1 to 3 ACEs	38.78	50.82	37.62	39.38	36.53	36.77	43.9	34.67	4.65
From 4 to 5 ACEs	20.62	14.75	22.77	20.04	19.04	18.5	17.7	24.89	3.30
6 or more ACEs	33.02	22.95	31.19	32.51	32.3	36.77	25.4	34.22	4.96***

Own elaboration.
* $p < .05$.
** $p < .01$.

4. Discussion

The first objective of this paper was to translate, adapt, and psychometric validate the ACE-IQ in Mexican adolescents. We achieved this objective following a translation process based on international guidelines and by providing information on the items´ ability to discriminate, reliability, and construct validity in a sample from 20 states of Mexico.

4.1. ACE-IQ validity

The findings show that this instrument is sufficiently reliable and valid to recommend its use for generating information on ACEs in studies on Mexican adolescents (Edwards & Wirth, 2009).

The validated version is brief, easily completed, and freely available. It gives the possibility to be included in multi-component surveys or be used by itself in ACEs prevalence and effects surveys. These data will help to understand the extent of the problem, generating information to serve healthcare providers and policymakers to design and implement prevention and care programs (Alvarez-Gutiérrez & Castillo-Koschnick, 2019; Carrillo-Urrego, 2018; Casas-Muñoz et al., 2022; Joshi et al., 2021; Meinck et al., 2017).

The literature on Adverse Childhood Experiences (ACEs) in low and middle-income countries suggests that the original ACEs identified in high-income countries are also important adversities for the people inhabiting these places. However, authors suggest that people in these regions may face other types of adversities related to the country's safety and socioeconomic conditions (Casas-Muñoz et al., 2021; Liaqat et al., 2021), which have not been included in the questionnaires and hypotheses. This study aims to validate an instrument that includes some of the new ACEs suggested in literature, in a sample of Mexican adolescents, to test its psychometric properties. Testing new experiences enriches the knowledge about ACEs and in Low and Middle-Income Countries (LMIC). That may impact public policy design, primary healthcare interventions, and research (Bellis et al., 2019; Meinck et al., 2017; Wade et al., 2017).

4.2. Eliminated ACEs

Seven ACEs categories were not included in the final version of the instrument after the psychometrical validation process: 1) parental divorce or separation, 2) childhood or adolescent marriage, 3) childhood or adolescent pregnancy, 4) peer isolation, 5) living in a single-parent family, 6) living institutionalized, and 7) low socioeconomic status. There may be several explanations for why these ACE constructs could not be psychometrically validated.

A first possible explanation may be due to the very low frequency of these experiences in this sample. Childhood or adolescent marriage, teen pregnancy, and living institutionalized had very low frequencies (<1 %). That can be explained since the included adolescents were all schooled, and these problems are known to cause school dropouts in many cases (Banda, Svanemyr, Fossgard, Goicolea, & Mumba, 2019). It is suggested to carry out further research on adolescents who do not attend school and are therefore

more vulnerable to certain conditions. This is because literature indicates that these items might be important in understanding childhood adversity in Mexico. Teenage pregnancy is a significant public health concern that affects 77 out of 1000 adolescents, according to the Women's National Institute (INMUJERES, 2021). Moreover, 4.9 % of the population aged 12 to 17 are married, and there are 35,000 institutionalized adolescents, as reported by the National Institute of Geographic and Statistics (INEGI, 2020).

A second reason can be related to collinearity issues in the confirmatory factor analysis. Some experiences are highly correlated to others like peer isolation is closely associated with bullying.

A third reason may be collectivist culture. Although experiencing parental divorce, living in single-parent families, and having a low socioeconomic status can lead to negative psychological outcomes in high-income countries (HIC) (Maksymova, Hrys, Maksymov, Krasilova, & Udovenko, 2021; Vink et al., 2019), the situation may be different in Mexico due to its collectively oriented culture (Diaz-Loving, 2017). The values, norms, and beliefs of this culture promote group interactions, enriching a social support network which may help compensate for these negative effects.

Regarding the factor structure, most of the ten original adverse experiences proposed by Felitti et al., considered the ACE-IQ primary domain were included, which has been consistent since the development of this assessment tool (Solberg & Peters, 2019).

On the second objective, the information generated by this study may serve to understand the extent of ACEs in Mexico and the characteristics of the affected population (Alvarez-Gutiérrez & Castillo-Koschnick, 2019; Carrillo-Urrego, 2018; Casas-Muñoz et al., 2022). Since the information generated by this study was the result of an ACEs self-report among adolescents, it might help reduce the recall bias compared to adult retrospective samples, which affects a considerable amount of information on this area (Meinck et al., 2017; Vink et al., 2019).

4.3. ACEs frequency

It's difficult to compare the frequency of ACEs in our study with previous ones due to methodological differences in the assessment tool (Child & Adolescent Health Measurement Initiative, 2013; Meinck et al., 2017; Sacks & Murphey, 2018; Vink et al., 2019). Our extended version considered more ACEs, resulting in a much higher percentage. Whereas previous studies found percentages between 50 % and 60 %, in our sample, 90 % of the participants had experienced at least one ACE, and 31.73 % had experienced six or more ACEs. This is concerning as experiencing six or more ACEs is associated with a 20-year decrease in lifespan (Brown et al., 2009).

The most frequent ACE in our population was neglect, experienced by 73.35 % of the participants, which is a larger frequency than the 20 % reported in other studies in HIC (Sacks & Murphey, 2018; Stoltenborgh, Bakermans-Kranenburg, & van IJzendoorn, 2013; Vink et al., 2019), or than the 50 % in found in Mexican children (Ruiz-Casares & Heymann, 2009).

There are two possible explanations for the higher rates of neglect found in this version of the questionnaire. Firstly, it may be since this version included more neglect items than prior versions, which could explain the difference. Previous studies on neglect have found that assessment and definition issues may have led to an underestimation of the problem (Vanderminden et al., 2019). Secondly, it is possible that adolescents misunderstood the questions and reported related conditions such as poverty, rather than neglect.

This is important because although neglect consequences seem to be as important as those of the more active types of abuse, it has not usually been the focus of research and policy-making; even this high percentage should be considered as a shred of sufficiently solid evidence to develop public policy and programs to support parents, children and adolescent in risk of neglect available at a large scale, to make their lives more bearable (Stoltenborgh et al., 2013).

The second most reported ACE was exposure to community violence, which reflects the country's public security situation, with higher rates of violence related to the nature of organized crime that has evolved and become more complex over the last ten years (Calderón, Heinle, Kuckertz, Rodríguez-Ferreira, & Shirk, 2021). The results are in line with the findings of Aisenberg, Trickett, Mennen, Saltzman, and Zayas (2007), who reported that 68 % of Latin American families experienced at least one form of community violence. Similarly, Zhen-Duan et al. (2022) found that 41 % of the families residing in the northern border of Mexico were exposed to community violence.

The study found differences in Adverse Childhood Experiences (ACEs) based on age and gender. Adolescent males between the ages of 10 and 14 had lower percentages of exposure to domestic violence, corporal punishment, or spanking, physical, and psychological abuse. One possible explanation could be the traditional Mexican culture that privileges and protects sons over daughters, resulting in better treatment for boys than girls (Diaz-Loving, 2017). Another possible explanation is that since there were few participants from this age group the sample may be biased and more studies emphasizing early adolescents are needed.

On sexual abuse, significant differences showed higher percentages for both female groups, which is consistent with previous literature (Sacks & Murphey, 2018; Vink et al., 2019; WHO, 2016). Statistically significant differences were observed in physical fights, with higher percentages for both male groups. This is consistent with the traditional Mexican culture's sexist beliefs, which promote male dominance and aggression. As a result, male individuals might try to prove their dominance by winning a physical fight (Diaz-Loving, 2017).

There were no statistically significant differences in ACE prevalence by geographic region.

4.4. Strengths and limitations

The strengths of this study are that it adapted and validated an extended version of the ACE questionnaire in Mexican Spanish which can be used in research on the topic, and this is the first epidemiological study in which the ACEs frequency was determined with the answers of adolescents from 20 states of Mexico, contributing to reduced recall-bias which affects much information on this subject.

Although the sample of this study was not representative, which is a limitation, it had participants from each of Mexico's eight geographical regions. Since states in the same region are expected to have similar characteristics (natural, historical, economic, and cultural factors) as opposed to states from different regions, by including states from all regions in the sample it can be considered a strength since it reflects the experience of adolescents from every region of México (Bassols Batalla, 1992).

Another limitation is validating the questionnaire among school adolescents. They have more literacy to understand the questions and potentially fewer ACE exposures such as teen marriage/pregnancy. It's possible that our study results are not entirely accurate because the schools that participated in our study might have been more concerned about adolescent rights, trauma, and preventing violence. This could have reduced the likelihood of ACEs affecting their students, leading to selection bias. To obtain more accurate results, further studies with nationally representative samples are necessary.

4.5. Conclusions

It is crucial to have information on Adverse Childhood Experiences (ACEs) and their consequences in low- and middle-income countries. This will help in planning better health and social services for individuals under 18 years of age. Therefore, it is necessary to have validated questionnaires for ACEs. This study provides a measurement tool that allows us to do so reliably and validly. The results on the frequency of ACEs revealed that 90 % of this schooled Mexican adolescent sample had experienced one or more ACEs, and about a third had experienced six or more, such high frequency stresses the urgent need for the development of public policies and large-scale programs to prevent ACEs, support families, and reduce harm in adolescents.

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CRediT authorship contribution statement

ACM conceptualized the present study. ACM and AEVR managed the data collection, ACM, AEVR, ARC, EPS, and MGA were responsible for conceptualizing and writing the paper, and AEVR led and conducted the analyses. All contributed to the interpretation of the findings and structure of the article. All authors reviewed and approved the final version.

Submission declaration and verification

The work described has not been previously published. It is not under consideration for publication elsewhere. Its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out. If accepted, it will not be published elsewhere in the same form, in English, or any other language, including electronically, without the written consent of the copyright holder.

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Declaration of competing interest

None.

Data availability

The data that has been used is confidential.

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References

Aisenberg, E., Trickett, P. K., Mennen, F. E., Saltzman, W., & Zayas, L. H. (2007). Maternal depression and adolescent behavior problems: An examination of mediation among immigrant Latino mothers and their adolescent children exposed to community violence. *Journal of Interpersonal Violence, 22*(10), 1227–1249. https://doi.org/10.1177/0886260507304292

Alvarez-Gutiérrez, M., & Castillo-Koschnick, J. G. (2019). *Panorama estadístico de la violencia contra niñas, niños y adolescentes en México*. México: UNICEF. Retrieved from https://www.unicef.org/mexico/media/1731/file/UNICEF%20PanoramaEstadistico.pdf.

Asociación Mexicana de Agencias de Inteligencia de Mercado y Opinión (AMAI). (n.d.). AMAI. Retrieved June 1, 2023, from https://www.amai.org/NSE/.

Baban, A., Cosma, A., Blazsi, R., Sethi, D., & Olsavszky, V. (2013). *Survey of adverse childhood experiences among Romanian university students*. Copenhagen: WHO Regional Office for Europe.

Banda, E., Svanemyr, J., Fossgard, I., Goicolea, I., & Mumba, J. (2019). Acceptability of an economic support component to reduce early pregnancy and school dropout in Zambia: A qualitative case study. *Global Health Action, 12*, 1. https://doi.org/10.1080/16549716.2019.1685808

Bassols Batalla, Á. (1992). *México: formación de regiones económicas. Igarss 2014*. Mexico: Universidad Nacional Autónoma de México. Retrieved from http://ru.iiec.unam.mx/1563/1/MexFormDeRegEco.pdf.

Bellis, M. A., Hughes, K., Ford, K., Ramos Rodriguez, G., Sethi, D., & Passmore, J. (2019). Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: A systematic review and meta-analysis. *The Lancet. Public health, 4*(10), e517–e528. https://doi.org/10.1016/S2468-2667(19)30145-8

Bethell, C. D., Carle, A., Hudziak, J., Gombojav, N., Powers, K., Wade, R., & Braveman, P. (2017). Methods to assess adverse childhood experiences of children and families: Toward approaches to promote child well-being in policy and practice. *Academic Pediatrics, 17*(7S), S51–S69. https://doi.org/10.1016/j.acap.2017.04.161

Borgers, N., de Leeuw, E., & Hox, J. (2000). Children as Respondents in Survey Research: Cognitive Development and Response Quality 1. *Bulletin of Sociological Methodology/Bulletin de Méthodologie Sociologique, 66*(1), 60–75. https://doi.org/10.1177/075910630006600106.

Boullier, M., & Blair, M. (2018). Adverse childhood experiences. *Paediatrics and Child Health, 28*(3), 132–137. https://doi.org/10.1016/j.paed.2017.12.008

Brown, D. W., Anda, R. F., Tiemeier, H., Felitti, V. J., Edwards, V. J., Croft, J. B., & Giles, W. H. (2009). Adverse childhood experiences and the risk of premature mortality. *American Journal of Preventive Medicine, 37*(5), 389–396. https://doi.org/10.1016/j.amepre.2009.06.021

Calderón, L. Y., Heinle, K., Kuckertz, R. E., Rodríguez-Ferreira, O., & Shirk, D. A. (2021). *Organized crime and violence in Mexico: 2021 special report, justice in Mexico*. San Diego: University of San Diego.

Carrillo-Urrego, A. (2018). Castigos en la crianza de los hijos e hijas: Un estado de la cuestión. *Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud, 16*(2), 719–740. https://doi.org/10.11600/1692715x.16206

Casas-Muñoz, A., Loredo-Abdalá, A., Sotres-Velasco, B., Ramírez-Angoa, L. V., Román-Olmos, J. A., & Cristerna-Tarrasa, G. H. (2021). Experiencias adversas en la infancia. Conocimiento y uso por médicos residentes de pediatría. *Gaceta Médica de México, 157*(1), 10–18. https://doi.org/10.24875/gmm.19005644

Casas-Muñoz, A., Velasco-Rojano, Á. E., González-García, N., Benjet, C., Caraveo-Anduaga, J. J., Martínez-Vélez, N. A., & Loredo-Abdalá, A. (2022). ISPCAN child abuse screening tool for children (ICAST-C): Translation and adaptation to Mexican Spanish, and psychometric properties tested in Mexico City adolescents. *Child Abuse & Neglect, 133*, 105826. https://doi.org/10.1016/j.chiabu.2022.105826

Chegeni, M., Haghdoost, A., Shahrbabaki, M. E., Shahrbabaki, P. M., & Nakhaee, N. (2020). Validity and reliability of the Persian version of the adverse childhood experiences abuse short form. *Journal of education and health promotion, 9*, 140. https://doi.org/10.4103/jehp.jehp_15_20

Child and Adolescent Health Measurement Initiative. (2013). *Overview of adverse child and family experiences among US children. Data Resource Center for Child and Adolescent Health*.

Diaz-Loving, R. (2017). *Las garras de la cultura, investigación en torno a las normas y creencias del mexicano*. México: Manual Moderno.

Edwards, M. C., & Wirth, R. J. (2009). Measurement and the study of change. *Research in Human Development, 6*(2–3), 74–96. https://doi.org/10.1080/15427600902911163

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., … Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine, 14*(4), 245–258. https://doi.org/10.1016/s0749-3797(98)00017-8

Finkelhor, D. (2018). Screening for adverse childhood experiences (ACEs): Cautions and suggestions. *Child Abuse & Neglect, 85*, 174–179. https://doi.org/10.1016/j.chiabu.2017.07.016

Ford, D. C., Merrick, M. T., Parks, S. E., Breiding, M. J., Gilbert, L. K., Edwards, V. J., … Thompson, W. W. (2014). Examination of the factorial structure of adverse childhood experiences and recommendations for three subscale scores. *Psychology of Violence, 4*(4), 432–444. https://doi.org/10.1037/a0037723

Graham, A. P., Powell, M. A., Anderson, D., Fitzgerald, R., & Taylor, N. (2013). *Ethical research involving children. UNICEF Office of Research Innocenti*.

Hashemi, L., Fanslow, J., Gulliver, P., & McIntosh, T. (2021). Exploring the health burden of cumulative and specific adverse childhood experiences in New Zealand: Results from a population-based study. *Child Abuse & Neglect, 122*, 105372. https://doi.org/10.1016/j.chiabu.2021.105372

Hernández, A., Hidalgo, M. D., Hambleton, R. K., & Gómez-Benito, J. (2020). International test commission guidelines for test adaptation: A criterion checklist. *Psicothema, 32*(3), 390–398. https://doi.org/10.7334/psicothema2019.306

Instituto Nacional de Estadística y Geografía INEGI. (2020). *Censo de Población y Vivienda 2020*. Ciudad de México: Instituto Nacional de Estadística y Geografía.

Instituto Nacional de las Mujeres INMUJERES. (December, 2021). *Estrategia Nacional para la Prevención del Embarazo en Adolescentes*, Gobierno de México. Retrieved 05-09-2023 from. https://www.gob.mx/inmujeres/acciones-y-programas/estrategia-nacional-para-la-prevencion-del-embarazo-en-adolescentes-33454#:~:text=El%20objetivo%20general%20de%20la,principales%20metas%20de%20la%20ENAPEA.

International Test Commission. (2017). ITC guidelines for translating and adapting tests. In ITC (Ed.), *Applied psychology* (2nd ed.). https://doi.org/10.1111/j.1464-0597.1975.tb00322.x ITC.

Joshi, D., Raina, P., Tonmyr, L., MacMillan, H. L., & Gonzalez, A. (2021). Prevalence of adverse childhood experiences among individuals aged 45 to 85 years: A cross-sectional analysis of the Canadian Longitudinal Study on Aging. *CMAJ Open, 9*(1), E158–E166.

Kalmakis, K. A., & Chandler, G. E. (2014). Adverse childhood experiences: Towards a clear conceptual meaning. *Journal of Advanced Nursing, 70*(7), 1489–1501. https://doi.org/10.1111/jan.12329

Kenny, D. A., & Milan, S. (2012). Identification: A nontechnical discussion of a technical issue. In R. H. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 145–163). New York: Guilford Press.

Li, C. H. (2016). The performance of ML, DWLS, and ULS estimation with robust corrections in structural equation models with ordinal variables. *Psychological Methods, 21*(3), 369–387. https://doi.org/10.1037/met0000093

Liaqat, S., Hassan, Z., Zeshan, M., & Naveed, S. (2021). Impact of adverse childhood experiences on the mother-infant social-emotional well-being in low- and middle-income countries. *Psychiatric Annals, 51*(7), 316–321. https://doi.org/10.3928/00485713-20210609-01

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130–149. https://doi.org/10.1037/1082-989X.1.2.130

Maksymova, N. Y., Hrys, A., Maksymov, M. V., Krasilova, Y. M., & Udovenko, J. M. (2021). Causes and criteria of disharmonies in family system functioning. *Linguistics and Culture Review, 5*(S4), 300–310. https://doi.org/10.21744/lingcure.v5nS4.1578

Meinck, F., Cosma, A. P., Mikton, C., & Baban, A. (2017). Psychometric properties of the adverse childhood experiences abuse short form (ACE- ASF) among Romanian high school students. *Child Abuse & Neglect, 72*, 326–337. https://doi.org/10.1016/j.chiabu.2017.08.016

Mwashala, W., Saikia, U., & Chamberlain, D. (2022). Instruments to identify risk factors associated with adverse childhood experiences for vulnerable children in primary care in low- and middle-income countries: A systematic review and narrative synthesis. *PLOS Glob Public Health, 2*(10), Article e0000967. https://doi.org/10.1371/journal

Oh, D. L., Jerman, P., Purewal Boparai, S. K., Koita, K., Briner, S., Bucci, M., & Harris, N. B. (2018). Review of tools for measuring exposure to adversity in children and adolescents. *Journal of pediatric health care: official publication of National Association of Pediatric Nurse Associates & Practitioners, 32*(6), 564–583. https://doi.org/10.1016/j.pedhc.2018.04.021

Raleva, M., Peshevska, D., & Sethi, D. (2013). *Survey of adverse childhood experiences among young people in the former Yugsoslav Republic of Macedonia*. Copenhagen: WHO Regional Office for Europe.

Ruiz-Casares, M., & Heymann, J. (2009). Children home alone unsupervised: Modeling parental decisions and associated factors in Botswana, Mexico, and Vietnam. *Child Abuse & Neglect, 33*(5), 312–323. https://doi.org/10.1016/j.chiabu.2008.09.010

Sacks, V., & Murphey, D. (2018). *The prevalence of adverse childhood experiences, nationally, by state, and by race/ethnicity. Child trends. Retrieved from file:///C:/Users/edus_/Downloads/ACESBriefUpdatedFinal_ChildTrends_February2018.pdf*.

Solberg, M. A., & Peters, R. M. (2019). Adverse childhood experiences in non westernized nations: Implications for immigrant and refugee health. *Journal of Immigrant and Minority Health, 22*(1), 145–155. https://doi.org/10.1007/s10903-019-00953-y

Stoltenborgh, M., Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (2013). The neglect of child neglect: A meta-analytic review of the prevalence of neglect. *Social Psychiatry and Psychiatric Epidemiology, 48*, 345–355. https://doi.org/10.1007/s00127-012-0549-y

Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews Neuroscience, 17*(10), 652–666. https://doi.org/10.1038/nrn.2016.111

Trizano, I., & Alvarado, J. (2016). Best alternatives to Cronbach's alpha reliability in realistic conditions: Congeneric and asymmetrical measurements. *Frontiers in Psychology, 7*(34), 1–8. https://doi.org/10.3389/fpsyg.2016.00769

Vanderminden, J., Hamby, S., David-Ferdon, C., Kacha-Ochana, A., Merrick, M., Simon, T. R., … Turner, H. (2019). Rates of neglect in a national sample: Child and family characteristics and psychological impact. *Child Abuse & Neglect, 88*, 256–265. https://doi.org/10.1016/j.chiabu.2018.11.014

Vink, R., Van Dommelen, P., van der Pal, S., Eekhout, I., Pannebakker, F., Klein Velderman, M., Haagmans, M., Mulder, T., & Dekker, M. (2019). Self-reported adverse childhood experiences and quality of life among children in the two last grades of Dutch elementary education. *Child Abuse & Neglect, 95*, 104051. https://doi.org/10.1016/j.chiabu.2019.104051

Wade, R., .J.R., Becker, B. D., Bevans, K. B., Ford, D. C., & Forrest, C. B. (2017). Development and evaluation of a short adverse childhood experiences measure. *American Journal of Preventive Medicine, 52*(2), 163–172. https://doi.org/10.1016/j.amepre.2016.09.033

West, S. G., Taylor, A. B., & Wu, W. (2012). Model fit and model selection in structural equation modeling. In R. H. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 209–231). New York: Guilford Press.

Whittaker, A. (2012). *Research skills for social work*. London: Sage.

World Health Organization. (2012). *Adverse childhood experiences international questionnaire (ACE-IQ) – Rationale for ACE-IQ*. Geneva: WHO.

World Health Organization. (2016). Fact sheet child maltreatment. Retrieved from: https://www.who.int/news-room/fact-sheets/detail/child-maltreatment.

World Health Organization. (2018). *ACE- IQ questionnaire*. Geneva: Switzerland. Retrieved from https://cdn.who.int/media/docs/default-source/documents/child-maltreatment/ace-questionnaire.pdf?sfvrsn=baed215c_2.

World Health Organization. (2021). WHO | Process of translation and adaptation of instruments. Retrieved June 9, 2020, from https://www.who.int/substance_abuse/research_tools/translation/en/.

Zhen-Duan, J., DeJonckheere, M., Raglin Bignall, W. J., Galván, J., Saavedra, N., & Berenzon Gorn, S. (2022). Interpersonal violence and psychological well-being: Perspectives of low-income patients, social workers, and medical doctors in Mexico City, Mexico. *Journal of Interpersonal Violence, 37*(1–2), 681–704. https://doi.org/10.1177/0886260520915543