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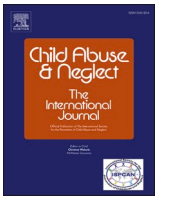

ISPCAN Child Abuse Screening Tool for Children (ICAST-C): Translation and adaptation to Mexican Spanish, and psychometric properties tested in Mexico City adolescents

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ABSTRACT

Background: Research using the IPSCAN Child Abuse Screening Tool for Children (ICAST-C), has provided ample evidence of the magnitude of violence against children. Knowledge about its psychometric characteristics and validity is limited. Hence, our objective was to translate and culturally adapt the ICAST-C in adolescents from Mexico City and determine its psychometric properties.

Participants and setting: To determine the psychometric properties of the instrument 723 adolescents between 11 and 18 years of age from 9 public secondary schools in Mexico City participated.

Methods: The study was carried out in two phases: 1) translation and adaptation of the instrument (in 5 steps) and 2) pilot evaluation of the psychometric properties. Total and factor reliabilities were determined, Pearson correlation was used for temporal stability while construct validity was determined by Confirmatory Factor Analysis (CFA), and final adequacy of the items eliminated by the CFA.

Results: We developed the culturally relevant Mexican Spanish version of the ICAST-C. The CFA confirmed the six-factor structure hypothesis. To improve the original model we eliminated ten items, the final model showed good global fit indices ($\chi 2(1310) = 2207.68$, $p < .01$, $\chi 2/df = 1.68$; CFI =0.95; RMSEA = 0.02 [CI95% 0.02–0.03]; SRMR = 0.08). Total and factor reliabilities were adequate (Alpha = 0.79–0.92, $r = 0.52$–0.75), except for the non-violent discipline factor (Alpha = 0.59, $r = 0.38$).

Conclusions: While these data suggest that this version of the ICAST-C is valid and reliable for adolescents in Mexico City public secondary schools, further research should evaluate the psychometric properties in a national sample.

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1. Introduction

Violence against children is a problem that affects all countries in the world, independent of culture, social class, educational and income levels, or ethnic origin (Pinheiro, 2006). Evaluation of violence against children has raised methodological and ethical challenges. These challenges are related to conceptual and operational differences, which in turn influence the available indicators and evidence on the magnitude and impact of this problem around the world (Runyan et al., 2009). The scarcity of the available data to estimate the prevalence of different types of violence throughout the world (Zolotor et al., 2009), is related to problems of detection and with official records of experiences of violence. Most official reports consider only more severe cases; thus, compromising the registration of subtle cases. This is because many of the criteria to determine the magnitude of the problem normalize violence as punishment or discipline (Álvarez-Gutiérrez & Castillo-Koschnick, 2019; Carrillo-Urrego, 2018). The importance of data quality transcends the public policies and programs that are established to prioritize, guarantee and protect children's rights (World Health Organization, 2020). Based on the above, the International Society for the Prevention of Child Abuse and Neglect (ISPCAN) has taken the initiative to improve the approach, measurement and evaluation of violence towards children, and this was recommended by the General Assembly and Secretary General of the United Nations Organization in the World Report on violence against children (Pinheiro, 2006). To assess, compare and gain a better understanding of children's and adolescents´ exposure to violence internationally, a panel of child abuse experts developed and tested the feasibility of using the ISPCAN Child Abuse Screening Tool for Children Questionnaire (ICAST-C) in children from forty countries (Zolotor et al., 2009).

While research using the ICAST-C, in its different versions, has provided ample evidence of the problem of violence towards children around the world, knowledge about its psychometric characteristics and validity is limited. Zolotor et al. (2009) reported feasibility evidence documented in 14 countries. In addition, Silveira and Grassi-Oliveira (2016) in Brazil, reported the semantic

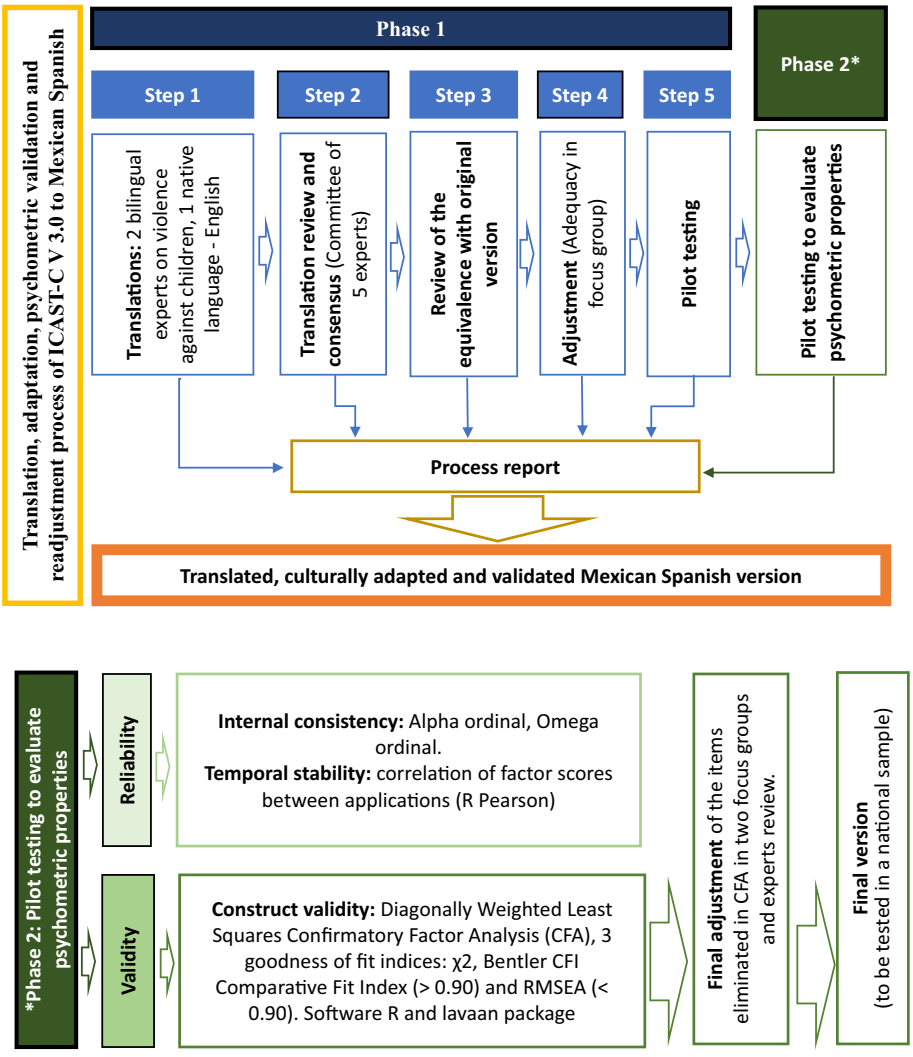

Fig. 1. Summary of the process of translation, adaptation, psychometric validation and readjustment of ICAST-C V3.0 items in Mexican Spanish.

validation process of the Questionnaire into Portuguese. Dhamayanti et al. (2020) in Indonesia tested the factor reliability and the item correlations. In Sri Lanka, Chandraratne et al. (2018) reported evidence of construct validity, demonstrated with principal component analysis; two confirmatory factor analyses were promising — one carried out in the Balkans with adequate fit (Meinck et al., 2020), and the other in Taiwan with acceptable results (Chang et al., 2013) — although some fit indices were below the recommended cutoff points. Finally, in South Africa, Meinck et al. (2018) adapted a brief version for clinical interventions known as ICAST-Trial, which has adequate fit in the confirmatory factor analysis, but with non-optimal adjustment in all indices (CFI 0.925 and TLI 0.908) (Hu & Bentler, 1999).

Currently, the available information on violence against children in Mexico is fragmented and limited, precluding an accurate and complete assessment and surveillance of the problem. A first step for such assessment is having a culturally validated and reliable screening tool. Such a tool, and the information derived from it, is essential to design more effective public policies to protect children (Álvarez-Gutiérrez & Castillo-Koschnick, 2019). Therefore, the objective of this study was to translate and culturally adapt the ICAST-C screening tool for violence against children in Mexico City and to determine its psychometric properties.

2. Methods

2.1. Design

We conducted an observational, longitudinal study in two phases as follows (Fig. 1): 1) Translation and adaptation of the instrument and 2) Pilot evaluation of the psychometric properties of the translated and adapted instrument. The Spanish adaptation versions can be reviewed in Appendix A (supplementary material).

2.2. Phase 1. Translation and adaptation of the instrument

We first obtained permission from ISPCAN to translate and adapt the original English version of ICAST-C V 3.0 to Mexican Spanish and to evaluate the reliability and validity of this new version. To carry out the translation and adaptation, we followed the recommendations of the International Test Commission (Hernández et al., 2020; International Test Commission, 2017) and the methodology proposed by the WHO (World Health Organization, 2021) and culturally relevant psychometric validation procedures (Hernández et al., 2020; Reyes-Lagunes & García y Barragán, 2008; World Health Organization, 2020). It was done in five steps: 1) translation, 2) revision of the translation and consensus, 3) revision of the equivalence with the original version, 4) adaptation, 5) piloting.

2.2.1. Participants and procedure

Different groups of participants were non-probabilistically selected for convenience for each of the steps.

1) Translation. Two Mexican bilingual experts (native language - Spanish) on violence against children, and a professional translator (native language English) participated. Translations were independently performed; cultural and language equivalence was closely watched. One of the translators enriched some items based on previous qualitative work on culturally relevant concepts of child abuse (Casas-Muñoz, 2016).
2) Translation review and consensus. A bilingual expert committee consisting of two professionals specialized in violence against children and three specialists in adolescent mental health reviewed the translations separately. There was 100 % agreement in half of the items and instructions. A face-to-face meeting was held where each item and instruction where there was disagreement was reviewed. By consensus, the best version of the instrument in Spanish was generated. Instructions were significantly reduced as, according to expert's experience, Mexican adolescents do not usually read them when they are long.
3) Review of the equivalence with the original version. To go above and beyond a simple translation of items we did a careful cultural adaptation as well. This review was performed by a bilingual (native language English) psychologist with a Ph.D. degree in Psychology, expert in adolescent mental health. She did her bachelor and master's degrees in her native country and doctorate in psychology in Mexico, has lived and worked in Mexico for over 20 years and thus knows Mexican culture and Spanish language very well.
4) Adjustment. Two focus groups informed the adjustment. The first consisted of seven adolescents (4 girls and 3 boys) aged 11 to 16. With regards to the instructions, we confirmed they prefer very short instructions and therefore they were simplified into a single statement. The second comprised of ten members (psychologists and social workers) from the Comprehensive Center for Recreation, Leisure and Orientation (CIELO, acronym in Spanish), who work with adolescents that are experiencing violence. The response options about the people who perpetrated the violent acts were modified, adding the place of occurrence, and the question, *"Do you use drugs or drink alcohol?"* was separated, since this information was relevant for the schools. Two versions of the instrument were generated (A and B). In version A, perpetrators and the place of occurrence questions were arranged vertically, like the original ICAST-C. In version B, the same questions were organized horizontally, like the version in South Africa (Meinck et al., 2018). The Spanish adaptation versions can be reviewed in Appendix A (supplementary material).

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5) Piloting. Two adolescent groups participated in this exercise, 18 boys and 18 girls, aged between 11 and 16 years participated in the first one, and 34 boys and 23 girls, between 11 and 16 years of age in the second one. All the participants were from the local area where the instrument would be administered. The two versions of the instrument (A and B) were administered, with the aim of identifying the best design to respond with pencil and paper. The median time spent in answering the versions was 16 min (min 3, max 47) for A and 11 min (min 9, max 34) for B and the participants reported that version B seemed to be shorter. Based on the pilot results, we decided to administer version B (horizontal) to the target population.

2.3. Phase two: pilot for evaluation of psychometric properties

2.3.1. Participants

A convenience sample of 723 adolescent students from nine Mexico City schools, located in neighborhoods classified into four different levels of social development according to the National Institute of Statistics and Geography (INEGI, acronym in Spanish), were included to ensure variability in the sample. The age of participants was between 11 and 18 years old, with a mean of 13.51 years and a standard deviation of 0.95. Most of them were in the second year of secondary education.

2.3.2. Sample size calculation

To review the psychometric properties of the instrument we calculated 560 participants calculating the root mean square error of approximation (RMSEA) based on the procedure proposed by MacCallum et al. (1996a, 1996b). We considered 62 items, 1953 degrees of freedom, a significance level of 0.05 and a statistical power of 0.80, as recommended in the literature.

2.3.3. Characteristics of the Instrument

The translated and adapted version of the ICAST-C measures five types of victimization: psychological abuse, physical abuse, sexual abuse, neglect, exposure to violence (domestic and community), and non-violent discipline. It consists of 62 items, 53 of them had seven Likert type response options: 0 (No, it has never happened to me,) 1 (Last year NO, but YES it has happened to me before), 2 (Once or twice a year, between 1 and 2 times), 3 (Several times a year, between 3 and 5 times), 4 (Once a month, between 6 and 12 times), 4 (Several times a month, between 13 and 50 times), and 6 (Once or more times a week >50 times). One item had four options 0 (Never), 1 (Sometimes), 2 (Almost always) and 3 (Always); and the rest of the seven had three response options: 1 (NO, but YES it has happened to me before); 2 (YES, it happened to me LAST YEAR) and 0 (It has not happened to me). And finally, there were 7 open-ended questions regarding children's opinions about the questionnaire.

2.3.4. Procedure

In the first semester of 2018, paper-and-pencil questionnaires were administered twice, between 4 and 6 weeks apart. This was carried out confidentially in the classrooms, during a 50-min class period, with the support of the staff of the schools and CIELO. Between two and three interviewers, trained in psychological first aid and crisis intervention, were present per room. The interviewers explained the study, obtained the informed consent (with an identification number) and delivered the questionnaires (also, identified with the same number). In addition, they conducted frequent monitoring of the needs of the participants and recorded all the questions that generated any doubts. At the end, they asked the participants if they wanted to talk about the content of the instrument or about some other situations. A space was created to talk about both the lived experiences of violence and other difficulties in their lives. During the administration of the instrument, it was noted that the greater number of response options increased the difficulty in answering the questionnaire. Some adolescents used finger calculation or mental calculation to get the answers. Afterwards, all participants received an awareness talk on self-management and on how to seek for help from CIELO. Furthermore, they were given a help card with information from the Center.

2.4. Ethical considerations

The study was approved by the Institutional Review board (Institutional Research and Ethics Committee). Besides obtaining informed assent from the children and consent from the parents. The latter signed a privacy notice for the handling of personal data (Consejo de Organizaciones Internacionales de las Ciencias Médicas (CIOMS) & Organización Mundial de la Salud (OMS), 2016). Permission to participate was also obtained from the school authorities. A psychologist was present while the participants filled out the questionnaires, to clarify doubts and monitor possible discomfort. No situation of discomfort was identified or reported. At the end of the session, the individual questionnaires were collected and reviewed for responses that indicated extreme physical violence, sexual abuse with penetration, and requests for help. The adolescents who were identified in this review or who requested help were given immediate attention by the psychologist avoiding stigmatization and revictimization and were referred to CIELO to receive free psychological evaluation and support. A global report of the main situations of violence referred to by the participants was delivered to each of the school principals. The members of CIELO worked in the schools with the adolescents in these situations.

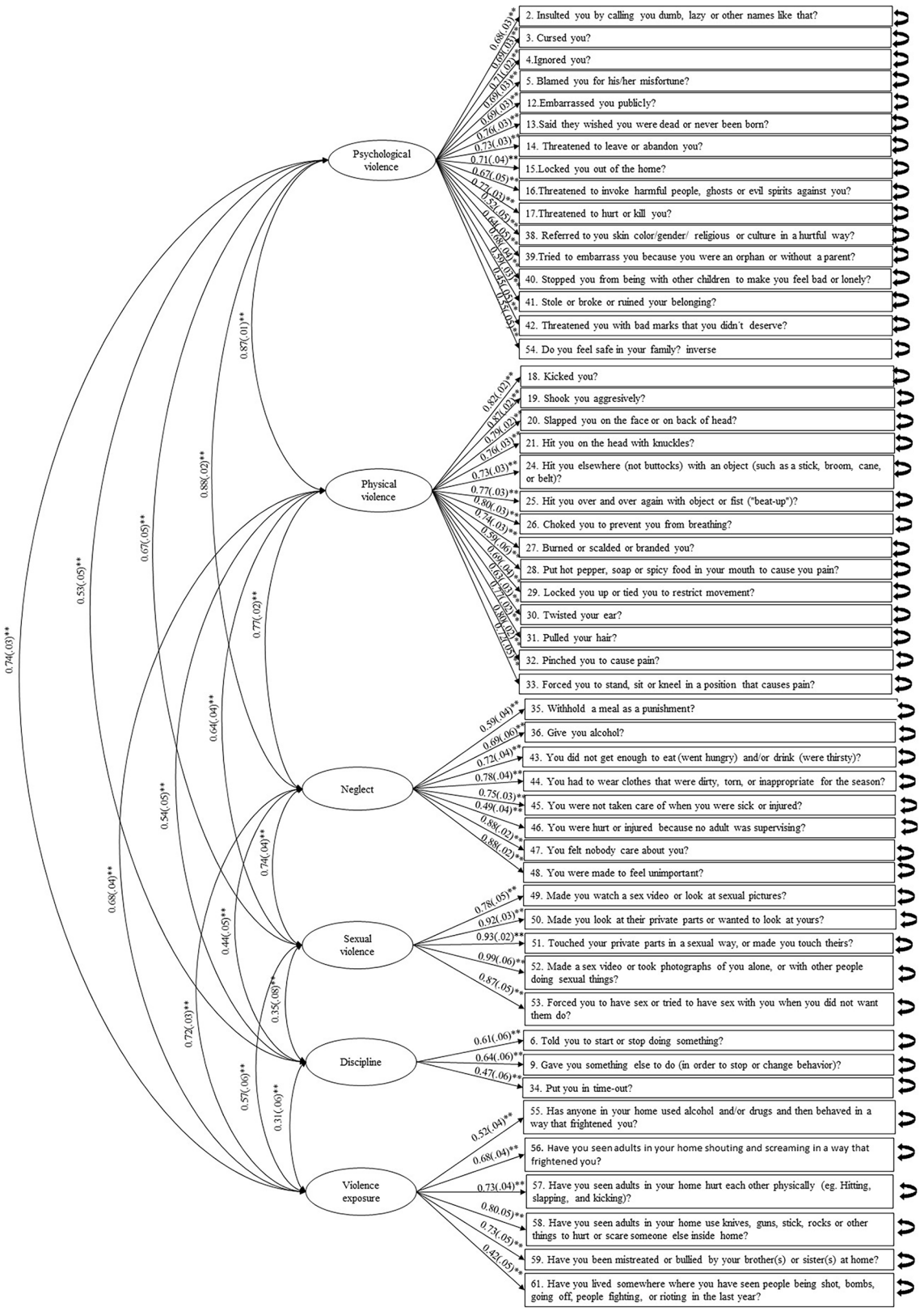

Fig. 2. Standardized solution for the modified ICAST-C model.

2.5. Statistical analysis

We performed initial descriptive frequency analyses of the distribution of participants' responses. The skewness coefficient and kurtosis were calculated. Mardia's multivariate normality test was used for skewness and kurtosis. Also, Shapiro-Wilk univariate normality test was performed for each of the items.

To determine the discrimination and factor structure of the scale items, we performed a Confirmatory Factor Analysis (CFA) in accordance with Edwards and Wirth (2009), since there was a prior hypothesis of the structure of the scale. We selected the Diagonally Weighted Least Squares (DWLS) estimation method, which is based on polychoric correlations, considered appropriate for treating ordinal data with lack of normality (Li, 2016; West et al., 2012).

A model was specified, which includes the 62 items that make up the scale. The items were organized into six dimensions according to the original 5 factor structure (Zolotor et al., 2009) with the additional new dimension as follows: psychological violence, physical violence, sexual violence, neglect, exposure to violence and the new dimension (non-violent discipline). To define the metric of the latent variable, the identification of the scale was done by setting the factor loading of the first item to one (Kenny & Milan, 2012). As a criterion to consider whether an item was correctly related to the latent variable that explained it, we searched for a lambda value >0.4 and made sure it had local adjustment that was identified through modification indices (Brown, 2015; Whittaker, 2012).

To evaluate the global fit of the model, we considered a good fit the following: the absolute goodness of fit test X^2 regardless of its probability (La Du & Tanaka, 1989), the Standardized Root Mean Square Residual (SRMS) $\leq$ 0.08,the Root Mean Square Error of Approximation (RMSEA) $\leq$ 0.05, with an upper limit of its confidence interval $\leq$ 0.08 (MacCallum et al. (1996a, 1996b)), and the Comparative Fit Index (CFI) $\geq$ 0.95 (Hu & Bentler, 1999). Analyses were carried out in R software with the lavaan package (Rosseel, 2012).

The reliability of each factor and the total scale were analyzed in two ways. 1) With the internal consistency of the items using the ordinal Alpha and Omega coefficients, appropriate for the type of data of the scale (Trizano & Alvarado, 2016); and 2) with its temporal stability (test - retest reliability), in a period of four to six weeks between the two measurements using a Pearson product moment correlation. Analyses were carried out in R software with the psych package.

3. Results

3.1. Phase two: evaluation of psychometric properties

3.1.1. Distribution

The frequency distribution of the responses showed that there were options endorsed with very low or null frequency. Therefore, we recoded the responses into three options: 0 (It has never happened to me), 1 (Yes, it happened to me, but before), 2 (It happened to me in the past year). When examining the frequency per option, the asymmetry coefficient, the kurtosis, and the normality tests of the recoded items, they were not normally distributed, neither individually nor as a whole (Mardia asymmetry = 170,437.65, $p<$. 01; Mardia kurtosis = 342.22, $p < .01$.

3.1.2. Discrimination and factor structure

Based on the comparative fit index (CFI) >0.95, the results of the model showed a global lack of fit to explain the data ($\chi 2(1814) = 3298.33, p < .01$, $\chi 2/df = 1.81$; CFI =0.93; RMSEA = 0.03 [95 % CI 0.02 to. 03]; SRMR = 0.08); therefore, it was decided to analyze the magnitude of the factor loadings (Fig. 2), and the local fit of the items using modification indices. These analyses showed that two items, 60 and 62, of the exposure to violence factor had factor loadings lower than acceptable (lambda<0.40). Item 60 is *"has someone close to you (relatives, friends or neighbors) murdered in the last year?"* and 62 is *"has someone broken into your house?"* Also, a total of 8 items were associated with lack of local adjustment. These were 1) two items (1 and 11) of the psychological violence factor (*"have they yelled at you or have they told you things very loudly?"* and *"have they forbidden you to go out as punishment?")*, 2) two items (22 and 23) of the physical violence factor [*"have you been spanked as punishment?* and *"have you been hit on the buttocks with any object (belt, sticks, rods, flip flops, cable, etc.)?"],* 3) three items (7, 8 and 10) of the non-violent discipline factor [*"have they explained to you why something you did was wrong? Have they rewarded you for behaving well?* and *have they taken away privileges (things that you like very much) or money as punishment?"],* and one item (37) of the neglect factor *(Did they give you drugs?)*. Based on this, it was decided to eliminate them and respecify the model. We decided to change item 54 (*Do you feel safe in your home?*) from violence exposure to psychological abuse based on modification indices.

The modified model with 10 eliminated items showed good global fit indices ($\chi 2(1310) = 2207.68, p < .01$; CFI =0.95; RMSEA = 0.02 [CI95% 0.02 to 0.03]; SRMR = 0.08), and supports the six-factor hypothesis. Its final structure is shown in Fig. 2.

3.1.3. Reliability

The different coefficients (Table 1), showed adequate reliability for the total and the scale factors for internal consistency (Alpha = 0.79 to 0.92), and temporal stability (test – retest) (r = 0.52 to 0.75) except for the non-violent discipline factor (Alpha = 0.59, r = 0.38).

3.1.4. Open-ended question results

Participants were asked if it was difficult to be open about the things they have experienced. Nineteen percent answered yes. The reasons for their answer were as follows: a) they were personal/private things (25 %), b) they had not talked about it with anyone (21

Table 1
Total and factor reliability for the ICAST-C original and modified model.

Dimension	Original model			Modified model		
	Internal consistence		Temporal stability r (test-retest)	Internal consistence		Temporal stability r (test-retest)
	Alpha ordinal	Omega ordinal		Alpha ordinal	Omega ordinal	
Psychological abuse	0.92	0.94	0.63**	0.92	0.94	0.63**
Physical abuse	0.94	0.96	0.61**	0.94	0.96	0.61**
Negligence	0.89	0.94	0.66**	0.89	0.94	0.66**
Sexual Abuse	0.95	0.97	0.52**	0.95	0.97	0.52**
Nonviolent Discipline	0.77	0.82	0.48**	0.59	0.61	0.38**
Exposure to violence	0.76	0.78	0.55**	0.79	0.88	0.56**
Total	0.94	0.94	0.77**	0.93	0.94	0.75**

** $p < .01$.

%), c) it reminded them of what they experienced (17 %), d) other causes (13 %), e) they did not want to say the reason (7 %), f) for fear (4 %) and g) unanswered (13 %). However, no adolescent reported psychological discomfort during the application.

3.1.5. Final adjustment of the items eliminated in the CFA

Finally, the items that were eliminated (Table 2) in the CFA and those that generated doubts during the applications were reviewed in two focus groups of participants aged 10 to 18, from Mexico City in a one-hour session. The first group consisted of 3 girls and 4 boys and the second group, 6 girls and 4 boys. A semi-structured interview guide asked about their understanding of the items that were removed in the CFA and those that generated questions during administration, the instructions and response options of the ICAST-C. Specifically, they were asked to think if the item could be answered with the response options, and if they were clear. In addition, they were asked to give possible explanations of the problems that led to their lack of adjustment and make suggestions for their improvement.

The possible causes of the lack of local adjustment and proposals for improvement of each of the items eliminated and those that generated questions during administration were identified, and the items were adapted, improved and reviewed by experts in order to get the final version for subsequent administration in a national sample (Appendix A supplementary material).

4. Discussion

We provide novel evidence for the reliability and validity of a multidimensional Mexican-Spanish self-report scale for measuring experiences of violence in adolescents. A particular strength is that we translated and adapted the ICAST-C instrument, which has been used and evaluated in other languages and countries, thus permitting comparisons between countries and cultural contexts.

The confirmatory factor analysis of this Mexican Spanish version is the first one to corroborate the six dimensions of the V3 adding the non-violent discipline to the original scale (Zolotor et al., 2009). This supports the construct validity of the scale, and adds to the accumulating evidence of its validity in other cultures (Chandraratne et al., 2018; Chang et al., 2013; Meinck et al., 2018; Meinck et al., 2020; Zolotor et al., 2009).

It is important to note that in the analysis with the 62 original items (V3) there was a lack of global fit in one of the four proposed indices (CFI = 0.93). This indicates that the model is susceptible to improvement. However, authors such as Xia and Yang (2019) point out that the cutoff points proposed by Hu and Bentler (1999) for the CFI index with values >0.95 are specific for the evaluation of models estimated with continuous data and the method of Maximum Likelihood. Therefore, caution is needed in the cases in which other estimators, such as Diagonally Weighted Least Squares (DWLS) and the cases of the present work are used. They should be seen, more as general guidelines to improve the models, instead of definitive criteria.

In the evaluation of the fit of models estimated with categorical data and the Diagonally Weighted Least Squares (DWLS) method, the preferred fit index to decide if a model has good adjustment and doesn't need further adjustment is the RMSEA. This is because RMSEA has good sensitivity to reject poorly specified models, demonstrated in simulation studies (Xia & Yang, 2019). Therefore, we had a target of RMSEA lower than 0.06 to approximate the original model (RMSEA = 0.03 [CI95% 0.02 to. 03]). Given this, we consider our model to have a good fit.

Despite the acceptable fit according to three of the four indices of the original model, we modified the model until an optimal level of fit was found for all the indices, in order to identify the items that might need improvement. Evaluation of the factor loadings and the local adjustment of the items, expressed in modification indices resulted in the elimination of ten items, two for having very low factor loadings (lambda <0.40) and eight for being associated with lack of local adjustment (Whittaker, 2012). The modified model had good (optimal) fit in all indices.

Once the items that required improvements were identified, we conducted focus groups with adolescents to identify possible causes of the items´ poor performance and to obtain proposals for change directly from the target population. Five possible causes were found for poor item performance:

The first was the existence of cultural differences in the expression of violence. Despite the universality of the emotions and

Table 2
Items that were eliminated in the confirmatory factor analysis, or that generated doubts in the pilot

Item eliminated (E) or that generated doubts (D) during the administration of the instrument	Motives	Suggestions
Factor 1. Psychological abuse		
1. Have they yelled at you or told you things very loudly? (E)	Participants indicated that it could be interpreted in two ways, either because of the volume or because of the severity of the content.	
2. Have they insulted you calling you lazy, stupid or something similar? (D)	Insults can be divided according to their strength or severity and are remembered differently. Those included in the reagent are mild.	Leave as insults without necessarily using examples
11. Have they forbidden you to go out as punishment? (E)	It can be understood differently depending on the age. It can work differently because the older ones go out alone more often. If the prohibition is of a special event, it makes it be remembered in a different way than something happens every day. Differentiate between prohibiting going out and prohibiting going out to recess by teachers.	You have been banned from going to an important event as a punishment.
13. Have they told you that they wish you were dead or that you had not been born? (D)	Wishing you were dead is different from wishing you had not been born and it is remembered differently because of the impact. The latter is worse. It is not Common.	Have they told you they wish you had not been born?
16. Have they threatened to bewitch you, curse you, or summon spirits against you? (D)	It is not very common. It happens in specific contexts and you have to add response options from specific places.	Have you been threatened with witchcraft or summoning spirits against you?
17. Have they threatened to hurt or kill you? (D)	It is necessary to separate hurting you from killing you. The options of a lot of frequency do not correspond with the threats of this type.	Have they threatened to hurt you? Have they threatened to kill you?
29. Have you been locked up or tied up? (D)	It is necessary to separate if it is due to punishment, bullying or kidnapping. You can get confused in the case of games or jokes with friends.	Have you been locked up or tied up as punishment? Have you been locked up or tied up for bullying?
42. Have they threatened to give you bad grades that you did not deserve? (D)	Little can happen that does not correspond to the very frequent options. It happens more in high school. It does not correspond to the options of people. It can include director, deputy director and counselors.	
Factor 2. Physical abuse		
18. Have they kicked you with the intention of hurting you or as punishment? (D)		
20. Have you been slapped or zapped? (D)	Slaps and zaps are different. Slaps are stronger, and Zaps are lighter. Slaps are remembered more. Also by context, slaps are given for fights and zaps are between friends.	
21. Have you been hit on the head with knuckles? (D)	Some teenagers did not know the word “coscorrón”.	Leave the action refer to specified in parentheses
22. Have you been spanked as punishment? (E)	It is well understood, but it is for younger children.	
23. Have you been hit on the buttocks with any object (belt, sticks, rods, flip flops, cable, *etc.*) (E)		
26. Have they tried to hang you or suffocate you? (D)	It is understood, but it is rare, and difficult to separate as punishment, fight or kidnapping.	
28. Have they put soap, chili or something unpleasant in your mouth to punish you? (D)	Chili does not work to punish, the other yes, unusual and for younger children.	
30. Have your ears been twisted or pulled? (D)	It is understood, but it is rare and for children.	
33. Have you been forced to stand, sit, or kneel in an uncomfortable or painful position? (D)	It is different in kidnapping and in punishment. Separate from the exercise.	
Factor 3 Negligence		
36 Did they give you alcohol? (D)		
37. Did they give you drugs? (E)	It depends on the intention. In negligence, it is not only if they gave you, but also if you found it. Clarify that they are drugs and not illegal. Differentiate if they gave you without knowing.	they offered you drugs They gave you drugs without you knowing They gave you drugs because you wanted to try them You took drugs from a family member
Factor 5 Nonviolent discipline		
	Parents do not usually explain things.	

(*continued on next page*)

Table 2 (*continued*)

Item eliminated (E) or that generated doubts (D) during the administration of the instrument	Motives	Suggestions
7. Have they explained to you why something you did was wrong? (E)		
8. Have they rewarded you for behaving well? (E)	It is not usually rewarded for something that is a duty or an obligation.	
10. Have they taken away privileges (things that you like very much) or money as punishment? (E)	It may not apply to all adolescents due to the economic situation. Not all of them receive money.	
Factor 6 Exposure to violence		
60. Has someone close to you (relatives, friends or neighbors) been murdered in the last year? (E)	It is something strong or serious. It is not frequent that it happens. They are very impressive things. Perhaps if the time in which the question is asked were extended, The answer could that it happened.	Make combined frequency and time response options.
62. Has someone broken into your house? (E)	It is not often that it happens. In the time of the pandemic, this kind of assaults on houses decreased.	Accompany it with clarifications on whether it was violent or not. If it was the act of stealing while you were at home or away from home and if they only stole objects or people or both.

behaviors associated with this phenomenon, culture regulates its public or private manifestations. It approves or censures them in different temporal, geographical and social contexts (Matsumoto & Hwang, 2012); for example, this is reflected in items 11, 22 and 23, which respectively ask, *"Have they forbidden you to go out as punishment?, Have they spanked you as punishment? and Have they hit you on the buttocks with any object (belt, sticks, rods, flip flops, cable, etc.)?* These items were reported as clear in their wording but were expected to be used in younger people or in rural settings.

The second cause could be ambiguity in the wording of the items, which leads to more than one possible interpretation, as seen in item 1, which asks, "Have they yelled at you or told you things very loudly?" The participants indicated that it could be interpreted in two ways, either because of the volume or because of the seriousness of the content.

A third possible cause was the socioeconomic context of the participants that might influence the frequency of engaging in certain practices. This may be the case of item 10, which asks, *"Have they taken away privileges (things that you like very much) or money as punishment?"* Because this presumably involves having money or objects to take away, this may not be a frequent strategy of parents in low socioeconomic contexts.

The fourth possible cause is the low correlation of some items of exposure to violence with the rest of the dimension. This was the case of the items 60 and 62 — *"Was someone close to you (relatives, friends or neighbors) murdered in the last year? and Has someone broken into your house?"* These items imply a different systemic level, changing the evaluation from the family to the community (Bronfenbrenner & Evans, 2000). This finding is consistent with what was found by Chang et al. (2013), Chen and Astor (2011) and Zolotor et al. (2009) for the same items. Nonetheless, these types of events could be relevant for some specific areas of the country, but not for all.

A fifth possible cause was related to the infrequency of using non-violent discipline strategies among Mexican parenting practices, for example, *"Have they explained to you why something you did was wrong? Have you been rewarded for behaving well?* Some ambiguity might be involved understanding their meanings, since these practices might be used in non-violent or violent ways depending on the tone of voice with which an expression is said that can change its meaning in collectivist cultures (Matsumoto & Hwang, 2019).

Consequently, future research should test the changes proposed by the focus groups to these items and evaluate the psychometric properties of the revised version of the scale with larger populations of Mexican adolescents that include other regions of the country before deciding whether to use them (MacCallum et al., 1992).

Our findings also suggest that the total scale and the individual factors are internally consistent (ordinal alpha and omega <0.79), with the exception of the non-violent discipline factor (ordinal alpha $= 0.59$, omega ordinal $=0.61$). Hence, future research should consider improving the wording of the eliminated items or elaborate new ones specifically for the population of interest, since they are forms of discipline that may be less culturally relevant in Mexico. Additionally, we also found adequate temporal stability (test – retest), except again for the factor of non-violent discipline.

Regarding the response options, the participants pointed out that the number of response options caused confusion. Moreover, it was observed while participants were answering the questionnaire that some of them had to count with their fingers in an effort to find the right answer; thus, it took more time than needed to answer the questions. In addition, the general distribution analysis showed very low or null frequency for some response options of some items, which can cause analytic problems that arise from items affected by zero inflation, or lack of correlation between items due to lack of enough frequency (Gupta et al., 2004). Therefore, we recommend reducing the number of response options and to review the period of time that the scale evaluates. Other strategies such as visual aids or a continuous range could be used for them to assess intensity.

Despite that 19 % of the participants reported in the open-ended questions that it was difficult to answer this type of instrument, none expressed psychological discomfort, on the contrary, it was beneficial since it allowed some of them to request help, which reinforces that these types of studies may represent more benefit than harm (International Society for the Prevention of Child Abuse

and Neglect, 2016).

4.1. Limitations of the study

The limitations include a possible bias in the selection of the participants, since the adolescents who participated were only the ones that the school authorities authorized and had the consent of their parents or guardians who got to know about the process and attended the meetings, and expressly gave their consent. This implies that adolescents who were possibly affected by neglect by having parents less involved in their education, or who suffered some other form of violence within the family could have been left out.

Despite that the proportion of boys and girls was adequate and that the socioeconomic levels were distributed in a balanced manner, there were no participants in conditions of extreme poverty or non-school attending youth. Therefore, we suggest that adolescents in extreme poverty and non-school attending youth be included in future studies, because they may be more vulnerable to violence due to the disadvantage or inequality they face in accessing education and care systems, coupled with the fact that their dynamics and exposure to violence may be different.

4.2. Strengths of the study

Despite the aforementioned limitations, this study is the first one that confirmed the six-dimension structure, provides novel evidence of the reliability and validity of a self-report measure for violence against children that can be used in Mexico and because it is a translation and adaptation of an internationally used instrument, allowing for comparability with other contexts. A specific strength of this work is the adaptation of the items focused on cultural equivalence and not on literal translation. Moreover, these adaptations were complemented with different qualitative techniques, among which are focus groups, carried out with groups of experts and adolescents.

4.3. Conclusions

A careful process of translation and adaptation of the ICAST-C to Mexican Spanish was carried out, and our findings suggest adequate reliability and validity of this version to measure violence exposure in adolescents in Mexico City. Such an instrument could be beneficial for epidemiological research and public policy to address the problem. Additional research to validate the modified version in a national sample is recommended.

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 in any other language, including electronically without the written consent of the copyright holder.

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Authors' contributions

ACM and NGG conceptualized the present study. ACM, NGG, CB, JJCA and ALA participated in the translation and adaptation process. ACM and NGG managed the data collection. ACM, NGG and AEVR had the responsibility for conceptualizing and writing the paper. AEVR led and conducted the analyses with the support of ACM, NGG, NMV, JJCA and CB. All contributed in the interpretation of the findings and structure of the paper. All authors reviewed and approved the final version.

Declaration of competing interest

None.

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Appendix. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chiabu.2022.105826.

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