Mental Health Outcomes in Communities Exposed to Armed Conflict Experiences

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Research

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Abstract

Background: Most of the population exposed to armed conflict experiences (ACE) live in low-income countries with limited resources for social investment and mental health. Populations exposed to ACE (e.g. victims and ex-combatants) show different levels of affectation in their mental health. In this work, we aim to identify relationships between different levels of ACE and mental health outcomes.

Methods: We start classifying the population in two groups: low and high exposition to ACE using the Extreme Experiences Scale (EX\textsuperscript{2}). We then use a Binary Logistic Regression (BLR) and a Lineal Regression to explore the relationships between low and high levels of ACE, the empathy dimensions of the Interpersonal Reactivity Index (IRI), and the presence or absence of mental health conditions. Being ACE levels our independent variable and categories derived from Axis I diagnosis of Mini-International Neuropsychiatric Interview and dimensions of IRI scale as dependent variables. Results were obtained by calculating the Odd Ratio, Beta values, and a coefficient interval of 95%.

Results: According to the cut-off points derived from the Scores of EX\textsuperscript{2} scale, the general sample were distributed in two groups: The group of high level of ACE (scores >2.5) with 119 subjects, and the low-level ACE group (scores<2.5) with 66 subjects. Our results evidence that people with high exposition to ACE experiment a higher Fantasy dimension of IRI scale and higher odds to present anxiety disorders, risk of suicide, or PTSD.

Conclusion: These findings allowed us to identify the influence of ACE on mental health outcomes, to classify exposed populations, and to design effective strategies of intervention and implementation of mental health programs in these communities.

Background

Armed conflicts are an unfortunate constant of human civilization (1). Moreover, most of the communities exposed to Armed Conflict Experiences (ACE) live in low-income countries with limited resources for social investment and mental health support (2). Mental health studies among populations exposed to ACE have focused on characterizing highly prevalent mental health disorders (e.g. depression, anxiety) and/or their symptoms associated with traumatic ACE by mainly using grouping criteria according to international normative (e.g. ex-combatants, victims) (3, 4). In this sense, Tobón et al. (5) and Sanchez-Padilla et al. (6) characterized adult ex-combatants and victims, who presented a proportion of mood and anxiety disorders of up to 34% in urban areas and up to 46% in rural ones. In addition, different empathic dispositional profiles (e.g. low empathic concern and personal distress) were observed across ex-combatants compared to controls based on the dimensions of the Interpersonal Reactivity Index (IRI).

Other studies such as the Colombian Mental Health Survey (2015) used semi-structured surveys like the Self Reporting Questionnaire (SRQ) (7, 8) and socio-demographic questionnaires in civilians. They evaluated, through descriptive and regression analyses, the associations between exposition to ACE and
mental health disorders (9). This study revealed that individuals exposed to ACE had a higher possibility of showing mental health disorders when compared to non-exposed people (6, 7). Additionally, other studies identified that civilians exposed to ACE also experimented a higher prevalence of mental health disorders, with emotional and psychological affectations (7, 10–12).

Government programs have prioritized grouping individuals as victims or ex-combatants based on the evidence mentioned above. However, there is a limited analysis of mental health outcomes in civilians exposed to ACE (13, 14). Thus, related studies include civilians, ex-combatants, and victims in a common quantitative category due to the lack of validated measures to control the level of ACE exposition. These situations have blinded the characterization of mental health outcomes in populations exposed to ACE and have constrained the evidence for developing public-health-based interventions focused on reducing the burden of mental health symptoms (13, 15).

Colombia is a well-known world referent of long-term and low-intensity armed conflicts with a wide impact on the continent. Official entities for victims such as RUV (From Spanish: unique registry of victims) inform that 18.5% of the Colombian population has been a victim. Reported events were mainly: forced displacement (7’553,750), homicide (1’010,989), and harassment (419,229) (14). Additionally, according to the Colombian Normalization and Reincorporation Agency (Agencia para la Reincorporación y Normalización –ARN), 74,277 people left illegal armed groups between 2001 and 2019 (16). Those events involve multiple non-combatant actors such as civilians, victims, military victims, and ex-combatants (17).

Classifying the population according to their level of ACE allows tackling difficulties related to: a) data quality, by addressing populations at risk by considering ACE as a measure of exposition; b) ecological fallacy, by attributing effects that occur at the macro level to individuals (18); and c) the influence of ACE in different dimensions (i.e. social, cultural, health) to characterize these events. Quantifying the exposition to ACE will support the establishment of mental health risks (19–21).

Previous studies in armed conflict and health identified limitations in the reliability of scales and questionnaires aiming to characterize relations between mental health and levels of exposition to ACE (19, 21–23). However, there are few instruments validated in Spanish used for this purpose (24). In this context, in Giraldo et al. (24) we previously validated the Extreme Experiences Scale (EX2) with populations exposed to ACE in Colombia. This instrument allowed us to enhance the reliability for classifying individuals according to their experience in terms of levels of exposition (e.g. low or high ACE), being sensitive to capture the exposition to chronic ACE expected in the Colombian scenario.

In the present study, we aimed to evaluate mental health outcomes in a population with different levels of ACE. Our hypotheses were: 1) EX2 is reliable to discriminate different experience levels of ACE, and 2) Populations with low and high ACE have differential patterns related to mental health outcomes (i.e. PTSD, anxiety, depression, mood disorders, and empathic dimensions). We expect that this study will contribute with relevant knowledge about the relation between mental health outcomes and ACE, in order
to enhance the attention of mental health services provided to these populations by the local government agencies.

**Methods**

**Participants**

A sample of 220 adult subjects participated in this study, 35 of them were excluded because of the missing data (missing in more than 95% of the items on the EX$^2$ and IRI scales). As inclusion criteria, we considered subjects of 18 years old and above who agreed to participate voluntarily and were exposed directly or indirectly to the armed conflict. Exclusion criteria were a history of brain damage, use of psychiatric/neurological medication, and substance abuse that may interfere with their ability to complete the questionnaires. These criteria were evaluated by a trained psychologist and applied to all participants.

To reach a heterogeneous sample, we invited different populations with direct or indirect experiences related to the Colombian armed conflict. For that, we used a convenience sample, where 78 ex-combatants in their reintegration route from the ARN participated (16). Additionally, we included a group of 107 participants from the general population. This group came from two municipalities in Antioquia, Colombia. Antioquia has been historically one of the Colombian regions most affected by the armed conflict, with actions of different legal and illegal armed actors (25–27). Moreover, between 2004 and 2009 Antioquia was the second region with higher homicide rates (16.137 homicides) (27). The two selected municipalities differed in indicators of displacement, homicides, and actions related to the conflict. This difference was necessary to find variability in levels of exposition to ACE. In the first municipality, between 1990 and 2013, the report of average homicide rate was 125 per 100.000 inhabitants and the average displacement rate was 105.9 per 10.000 inhabitants. For the same period, the second municipality had an average homicide rate of 65.6 per 100.000 inhabitants and an average displacement rate of 25.2 per 10.000 inhabitants.

Figure 1 presents the sample used in this study. Our final sample consisted of 185 participants that accomplished the minimum sample criterion by item (10 participants by each variable) to apply the logistic regression used for the statistical analysis (28, 29). The participants were divided in two groups: 1) population with low ACE and 2) population with high ACE. These levels were based on the EX$^2$. Scores below 2.5 represented the low exposition group and scores over 2.5 represented the high exposition group. This cut-off point was previously validated with populations exposed to the Colombian armed conflict (i.e. victims and ex-combatants) (24). With this sample criterion we were able to evaluate the population according to their ACE level.

**Assessment Instruments**

Interpersonal Reactivity Index (IRI)
This scale was created by Davis (30), adapted to its Spanish version by Mestre, Frías, & Samper (31) and validated for a sample of Colombian ex-combatants by Garcia et al; Pineda et al (32, 33). This is a 28 item self-report instrument. Nineteen of them were redacted in a positive sense and nine in negative. It has five-answer options on a Likert scale being the first option “it does not describe me well” and the last one “it describes me very well”. IRI is divided into four dimensions defined as Fantasy (FS), which explores the way that the subject self-identifies with fictional context and characters in stories such as novels, books, or movies; Empathic Concern (EC) evaluates the responses of compassion or sympathy considering misfortunes toward others; Personal Distress (PD) evaluates the response of the subjects under stressor circumstances for themselves and other people; and Perspective Taking (PT), which assesses the ability to consider someone else's points of view through experiences and dispositions of other people. The reliability of this scale was validated for Colombian ex-combatants with an Alpha coefficient of 0.76 (32, 33).

Extreme Experiences Scale (EX²)

The EX² is a questionnaire with 18 items adapted from the Extreme Experiences Inventory (34) and validated for the Colombian armed conflict contexts by Giraldo et al. (24). The scale has yes/no response options where affirmative questions have a value of 1, providing a score between 0–18 points. The questions inquire if the individual or their relatives suffered death threats, aggressions, kidnapping, beating, or any other event considered as exposition to ACE.

The scale has a good internal consistency (KR-20: 0.80, 95%CI 0.76–0.84) and demonstrated fit for the two-dimensional model (CFI 0.91, TLI 0.90, RMSEA 0.05 (IC90% 0.04–0.07)). It has a 90% capacity to differentiate individuals between low and high exposition to armed conflicts (24).

Mini-International Neuro-psychiatric Interview Version 5.0

The MINI (35) is a structured interview designed to evaluate Axis I diagnoses based on the criteria of DSM–IV (36), assigning a value of 1 for affirmative diagnoses and 0 to the absence of diagnoses. The interview reliability has presented a kappa coefficient ranging from 0.88 to 1.0 and a good test-retest diagnosis, with a kappa between 0.76 and 0.93 (37). This instrument has been used in populations exposed to war and armed conflicts such as war veterans and refugees (38, 39).

Procedure

This is a cross-sectional study that explores the relationship between exposition to ACE due to the armed conflict in Colombia and mental health outcomes. Initially, participants were informed about the purpose of the study, questionnaires, scales, privacy, the confidentiality of data management, and the implications and benefits for participating in this study. Individual acceptance was supported by signing the informed consent. This document was approved by the Ethics Committee of the Faculty of Medicine from the University of Antioquia, Medellín, Colombia. Afterward, they were evaluated by a trained psychologist.
through an individual interview, where they were inquired about the presence of neurological or psychiatric conditions and about their possible exposition to ACE.

**Statistical analysis**

The data analysis started with data cleansing of outliers, missing data, and inconsistent information. For each variable (EX\(^2\), MINI, and IRI), we accepted a maximum of 5% of missing data and replaced these values with the median; variables above this percentage were eliminated. Only item 28 of the IRI (translated from Spanish: “Before criticizing someone, I try to imagine how I would feel if I were them”) surpassed 5% of missing data. It presented 33.5% of missing data and it was thus eliminated.

Considering the context of the participants evaluated in this study, we decided to analyze the IRI based on the theoretical model reported by García et al. (32). To guarantee the reliability of the IRI scale without item 28, and to verify the consistency of the 17 items model, we performed a Confirmatory Factor Analysis excluding item 28 to identify changes in the data structure. The analysis suggested that there were no structural changes for the confirmatory model by excluding this item. The complete analysis is available in Supplementary Material 1.

After the preliminary analysis and data cleansing, we evaluated the bivariate association between ACE (obtained with EX\(^2\)) and mental health outcomes (i.e. empathic or clinical diagnosis). To evaluate the association with clinical diagnosis (MINI), we established a chi-square association test. For associating ACE with empathy (IRI), we first evaluated the normality of the empathy scores by Shapiro-Francia test (40) and then analyzed the U-Mann Whitney test for median differences.

Finally, we explored the level of ACE as a key factor to explain changes in mental health outcomes of populations affected by the armed conflict. In order to determine the relative weight of ACE, we used a Binary logistic regression (BLR) and a linear regression model (LRM), with levels of ACE as the independent variable and mental health outcomes (e.g. depression, anxiety, fantasy) as dependent variables. All models were adjusted for demographic variables that might interfere in the model such as age, years of education, and gender. To observe significative associations between ACE and mental health outcomes, we estimated the odds ratio with a confidence interval of 95%. The statistical modeling process was carried out using the enter selection method. A p-value < 0.05 was considered as statistically significant. All the analyses were performed with SPSS 23rd version (41) and Stata 14th version (42).

**Results**

Table 2 show bivariate analyses to explore the associations between ACE levels and the mental health outcomes evaluated in this study. We found significant differences in the group of high ACE characterized by a larger proportion of anxiety disorders (22.2%), particularly in Posttraumatic Stress Disorder (PTSD) (14.4%) and suicide risk (17.8%) comparing to low ACE group.

Table 3 shows the BLR model exploring the influence between exposition to ACE and the mental health outcomes evaluated in this study. The BLR analysis was adjusted by age, gender, and years of education.
The model explored ACE through the EX² scale and mental health outcomes through the MINI scale.

We found that populations with high ACE had more probability of presenting clinical mental health outcomes. Additionally, the possibility to have an anxiety disorder in the population with high ACE is 2.34 times higher than subjects with low ACE. In the same way, population with high ACE presented higher odds to develop PSTD (OR 5.63; CI 95%: 1.24 to 25.67), and suicide risk (OR 3.28; CI 95%: 1.25 to 8.63) compared to participants with low ACE.

There were no significant mean differences in socio-affective dimensions evaluated by the IRI with respect to the levels of ACE. Table 4 presents the results for each dimension of the scale.

Table 5 presents the influence of ACE in cognitive and affective dimensions of the IRI scale. Results show that a high ACE only influences the Fantasy dimension ($\beta = 1.77$, 95% CI 0.28 to 3.26). For other cognitive and affective dimensions, ACE did not present significant differences.

**Discussion**

The aim of this study was to evaluate mental health outcomes in a population with different levels of ACE calculated by the EX² scale, a variable that we hypothesized influences the appearance of mental health outcomes (measured by the MINI and the IRI scale). Through BLR and linear regression models, we found that the group with high ACE presented higher possibilities of reporting anxiety disorders, PTSD, and suicide risk. Additionally, this group also presented differences in cognitive dimensions of empathy evaluated by the IRI scale, evidencing higher scores in IRI-fantasy dimensions among individuals with high ACE, suggesting that this relation is crucial to program the socio-affective response.

Moreover, our study was supported by a previous validation of the EX² scale (24). This allowed us to suggest that the EX² cut-off point of 2.5 is sensitive and reliable to discriminate population's mental health outcomes according to their low or high level of exposition to ACE. A similar cut-off point was previously reported for traumatic events (not only in armed conflict context) by Cherewick et al (43), where scores for potentially traumatic events were 2.2 and 2.3 for males and females respectively (43). This contributes to solving gaps presented in previous studies to classify the level of ACE in countries such as Colombia (19, 21, 23, 24, 44, 45). Although the construct of ACE is recent, our study found a relation between high levels of ACE through the EX² scale and mental health disorders, particularly for anxiety disorders, PTSD, and risk of suicide. These findings complemented the information reported in other studies that evaluated mental health outcomes in different populations exposed to ACE (20, 21, 46, 47). Furthermore, a higher proportion of anxiety disorder, depression, PTSD, and smoking were observed in territories with more armed conflict actions.

Fantasy dimension is the ability to self-identify with fictional contexts (such as characters of novels). Previous studies based on the IRI scale in Colombian ex-combatants identified different empathic profiles (48–50). One of these profiles was effectively characterized by high scores in cognitive dimensions (i.e.
FS, PT), suggesting that people exposed to ACE may tend more frequently to assign explanations to interpret unfortunate situations. Similar results were reported by Agaibi et al. (44), where people exposed to extreme stress and trauma experimented different patterns of coping styles, changing their socio-affective and mental health response. Empathic dimensions such as fantasy allow creating coping strategies to face traumatic situations in terms of religiosity, or high expectations about how things will get better in a near future. Furthermore, such relation of ACE and fantasy might influence their perception of affective and cognitive states and the response of their social context, as previous studies reported (51).

No other relations were found between ACE and mental health outcomes derived from MINI and IRI. To our knowledge, this is one of the first approaches that relate mental health outcomes (such as clinical conditions and empathy dimensions) with the exposition to ACE. In summary, our study confirmed the cut-off point suggested by Giraldo et al. (24), and showed to be a good predictor to explore mental health outcomes (e.g. mental disorders) in populations classified with high levels of ACE by the EX$^2$ scale; mainly in anxiety disorders, PTSD, and risk of suicide.

Furthermore, the regression model was relevant to identify the relations between mental health outcomes and different levels of ACE. This model advanced in the identification of a) the influence of the exposition to ACE on the appearance of mental health disorders (i.e. anxiety disorders, suicide risk, and PTSD); and b) the relation between ACE and changes in empathic dispositions (i.e. fantasy). These models (based on levels of ACE calculated from the EX$^2$ scale) improve the quality of information used to identify risk and protective factors. Additionally, previous studies classify their samples mainly by using a legal framework (i.e. victims, ex-combatants, and refugees) (16, 52). In this study, we propose a novel analysis of mental health outcomes for individuals exposed to ACE outside of such a framework used by other authors (21, 53). Thus, instead of considering only the mental health diagnosis, we also considered the use of socio-cognitive instruments to evidence social and affective aspects of mental health, such as it is presented in empathy dimensions. We aspire that this approach will improve the effectiveness of the attention to prevent outcomes in the populations affected by these events.

Although our sample size was small compared with previous studies (6), our statistical model guaranteed: 1) The reliability of the results, because the regression model is a robust model adapted for small sample sizes; 2) No differences in socio-demographic variables that commonly work as confounding; and finally, 3) our findings are aligned with previous studies that used large samples (7, 20, 21). In addition, studies about mental health in populations affected by armed conflicts had shown limitations in the reliability of the questionnaires to measure the exposition to ACE (2, 21, 23). Our study controlled this by using a validated instrument (i.e. EX$^2$) (24).

The results of our study represent an important piece of evidence for mental health professionals, especially to direct their efforts on strategies oriented to implement effective interventions required in populations affected by armed conflicts. Moreover, we suggest the importance of considering not only the aspects reported in this study but also other elements of their particular social context (e.g. access to
health and educational services). On this sense, we expect that future studies develop two lines of intervention: 1) to perform a systematic characterization of the samples based on reliable inventories such as EX\(^2\) in populations affected by ACE. 2) through the implementation of evidence-based interventions, focused on enhancing social abilities, responding to particular contexts and beliefs, as reported in previous studies (7, 49, 54). This would contribute to integrate different approaches such as public health strategies, to develop cost-effective models to assess mental health risks across populations exposed to ACE.

Moreover, such intervention might enhance the sensitivity to evaluate mental health outcomes in armed conflict contexts, providing new evidence to transfer to epidemiological and clinical fields (36, 54). We envisage that in the future the replication of our results inform mental health public policies adapted for populations exposed to ACE. We expect that future studies will promote the use and transference of these associative models, not only to communities chronically exposed to armed conflicts but also to populations with extreme vulnerability experiences, such as refugees and people affected by forced displacement. Additionally, we expect further advances in the study of mental health outcomes and coping strategies observed in populations exposed to ACE (10).

**Conclusion**

This is one of the first studies focused on classifying populations exposed to ACE in terms of low or high levels of exposition and establishing an association with mental health outcomes such as anxiety, risk of suicide, PTSD, and fantasy. The EX\(^2\) is one of the first instruments that allows classifying populations based on the exposition to ACE. It contributes with new evidence to improve characterization and potential evidence based intervention programs.

**Abbreviations**

ACE  
Armed Conflict Experience

ARN  
Colombian Normalization and Reincorporation Agency (Agencia para la Reincorporación y Normalización)

BLR  
Binary Logistic Regression

EC  
Empathic Concern

EX\(^2\)  
Extreme Experience Scale

FS  
Fantasy

IRI
Interpersonal Reactivity Index
MINI
Mini-International Neuropsychiatric Interview Version 5.0
PD
Personal Distress
PT
Perspective Taking
PTSD
Post-Traumatic Stress Disorder
RUV
Registro Único de Víctimas
SRQ
Self Reporting Questionnaire
WHO
World Health Organization

Declarations
The authors declare not having conflict of interests.

Ethics approval and consent to participate
The research ethics committee of the National School of Public Health at the University of Antioquia granted the ethical approval for this study with the certificate CI 00236–2018. Participants signed the informed consent after they were informed about the aims of the study. This study guaranteed the appropriate conditions of archiving, confidentiality, storage, and manipulation of the information.

Consent for publication
Not applicable.

Availability of data and material
The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests
The authors declare that they have no competing interests.

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Authors' contributions

Supervision of the study: ST, LSG, NT; conception and design of the study: ST, LSG, NT, JDL, AAM; writing the manuscript: ST, LSG, NT; data collection: ST, NT, JDL; data analysis: LSG, ST; discussion and analysis: ST, LSG, NT, JDL, AAM. Additionally, all authors read and approved the final version of this manuscript.

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**Tables**

**Table 1.**

Demographic information about the groups with ACE
<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Low ACE (n= 66)</th>
<th>High ACE (n=119)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Sex (p value 0.168&lt;sup&gt;a&lt;/sup&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>44 (66.7)</td>
<td>67 (56.3)</td>
</tr>
<tr>
<td>Men</td>
<td>22 (33.3)</td>
<td>52 (43.7)</td>
</tr>
<tr>
<td>Age (median DE) (p value 0,002&lt;sup&gt;b&lt;/sup&gt;)</td>
<td>35.2 (14.5)</td>
<td>37.4 (10.8)</td>
</tr>
<tr>
<td>Years of education (median DE) (p value 0,024&lt;sup&gt;b&lt;/sup&gt;)</td>
<td>10.5 (3.7)</td>
<td>9.7 (3.4)</td>
</tr>
</tbody>
</table>

<sup>a</sup>: test chi square of independence

<sup>b</sup>: test t student

ACE: Armed Conflict Experience

### Table 2.

Distribution of mental health outcomes by group according to their ACE level.

<table>
<thead>
<tr>
<th>Mental health outcome</th>
<th>Total</th>
<th>Low</th>
<th>High</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>41</td>
<td>22.2</td>
<td>9</td>
<td>13.6</td>
</tr>
<tr>
<td>Suicide risk</td>
<td>33</td>
<td>17.8</td>
<td>6</td>
<td>9.1</td>
</tr>
<tr>
<td>Mood Disorder</td>
<td>30</td>
<td>16.2</td>
<td>8</td>
<td>12.1</td>
</tr>
<tr>
<td>Posttraumatic Stress Disorder</td>
<td>19</td>
<td>10.3</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Alcohol abuse</td>
<td>15</td>
<td>8.1</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>Psychotic disorder</td>
<td>11</td>
<td>5.9</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Antisocial disorder</td>
<td>7</td>
<td>3.8</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Eating disorder</td>
<td>2</td>
<td>1.1</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Sample</td>
<td>185</td>
<td>66</td>
<td>119</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>: Pearson chi square test
Table 3.

Odds ratio associations among variables of mental health outcomes and high/low levels of ACE.

<table>
<thead>
<tr>
<th>IRI Dimension</th>
<th>Low</th>
<th>High</th>
<th>Difference of means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood disorder</td>
<td>1.66 (0.69 to 4.04)</td>
<td>2.34** (1.02 to 5.33)</td>
<td>0.105 d</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>3.19 (0.81 to 12.63)</td>
<td>5.99 (0.73 to 49.18)</td>
<td>0.120 d</td>
</tr>
<tr>
<td>Alcohol abuse</td>
<td>3.59 (0.39 to 32.79)</td>
<td>5.63** (1.24 to 25.67)</td>
<td>0.205 d</td>
</tr>
<tr>
<td>Psychotic disorder</td>
<td>3.28** (1.25 to 8.63)</td>
<td>14.9 (3.61)</td>
<td>0.120 d</td>
</tr>
<tr>
<td>Antisocial disorder</td>
<td>15.2 (2.32)</td>
<td>14.3 (3.61)</td>
<td>0.205 d</td>
</tr>
<tr>
<td>PTSD</td>
<td>11.0 (3.87)</td>
<td>11.7 (4.14)</td>
<td>0.227 d</td>
</tr>
</tbody>
</table>

Adjusted for age, sex, educational level - **p value <0.05 – ACE: Armed Conflict Experience – OR: Odds Ratio – PTSD: Post-Traumatic Stress Disorder

Table 4.

Mean differences in IRI scores according to ACE levels.

<table>
<thead>
<tr>
<th>IRI Dimension</th>
<th>Low</th>
<th>High</th>
<th>Difference of means</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>15.2 (2.32)</td>
<td>14.3 (3.61)</td>
<td>0.105 d</td>
</tr>
<tr>
<td>FS</td>
<td>13.0 (4.38)</td>
<td>14.3 (5.61)</td>
<td>0.120 d</td>
</tr>
<tr>
<td>EC</td>
<td>14.3 (3.23)</td>
<td>14.9 (3.26)</td>
<td>0.205 d</td>
</tr>
<tr>
<td>PD</td>
<td>11.0 (3.87)</td>
<td>11.7 (4.14)</td>
<td>0.227 d</td>
</tr>
</tbody>
</table>

Table 5.

Association between EX\(^2\) scale and empathy variables from IRI in population exposed to the armed conflict.

<table>
<thead>
<tr>
<th>Lineal Model</th>
<th>PT</th>
<th>FS</th>
<th>EC</th>
<th>PD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>CI 95%</td>
<td>b</td>
<td>CI 95%</td>
</tr>
</tbody>
</table>

EX\(^2\) Scale (ref low ACE)

<table>
<thead>
<tr>
<th></th>
<th>PT</th>
<th>CI 95%</th>
<th>FS</th>
<th>CI 95%</th>
<th>EC</th>
<th>CI 95%</th>
<th>PD</th>
<th>CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>High ACE</td>
<td>-0.82</td>
<td>-1.75 to 0.08</td>
<td>1.77</td>
<td>0.28 to 3.26</td>
<td>0.71</td>
<td>-0.18 to 1.60</td>
<td>0.86</td>
<td>-0.23 to 1.96</td>
</tr>
<tr>
<td>Constant</td>
<td>13.12</td>
<td>10.39</td>
<td>10.73</td>
<td>12.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adjusted for age, sex, educational level - \(*p \text{ value } <0.05\) ACE: Armed Conflict Experience - CI: coefficient Interval – PT: Perspective Taking – FS: Fantasy – EC: Empathic Concern – PD: Personal Distress

Figures
Figure 1

Description of the sample: low and high ACE.