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Validation of the Adverse Childhood Experiences Questionnaire

Trabalho realizado sob orientação de

Professor Doutor Ricardo Pinto

Novembro, 2019

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Validation of the Adverse Childhood Experiences Questionnaire

Dissertação de Mestrado

Psicologia Clínica e da Saúde

Dissertação defendida em provas públicas na Universidade Lusófona do Porto no dia 19/11/19, perante o júri seguinte:

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Além dos outros elementos.

Novembro, 2019

Dedicatória

A ti Mãe, agradeço por todo o amor, paciência, preocupação e suporte. És, sem dúvida, o meu maior apoio, e se algum dia eu tivesse de desejar ser alguma coisa, eu desejaria ser como tu

A ti Pai, por todo esforço, coragem e positividade, quando eu já não a conseguia encontrar

A ti Avó, que me levaste pela mão no meu primeiro dia de aulas, e continuas cá, passado 18 anos, para agora me vires buscar da mesma forma, com a tua alegria

A ti Renato, por todos os risos e orgulho, por seres o irmão que nunca tive e que não podia pedir melhor

A ti tia Céu, por seres a minha segunda mãe, por cuidares de todos que eu amo

A ti madrinha, por toda a paciência. A ti padrinho, que és a figura mais próxima de um avô para mim

A ti Miguel, por toda a proteção, por ser um orgulho ensinar-te e aprender contigo

A ti Diana, por me mostrares que a distância nunca é maior que o afeto

A ti Sofia, por me dares sempre o melhor de ti e por depositares tanta confiança em mim

A ti João, que chegaste tarde (sempre atrasado) mas a tempo de me mostrares a luz e colorires de novo os meus dias. Obrigada pelo apoio e amor, e por me tornares numa pessoa melhor, mais feliz

Agradecimentos

Ao Prof. Doutor Ricardo Pinto, o meu orientador, agradeço toda a dedicação e disponibilidade. O seu encorajamento e motivação foi realmente importante ao longo deste processo e sem dúvida que me despertou um maior interesse pela área da investigação.

À Professora Patrícia Correia Santos, agradeço por todo o apoio e por se mostrar sempre tão disponível.

A todos os docentes da Universidade Lusófona do Porto, que me acompanharam ao longo da formação académica. Sem dúvida que foi um prazer aprender com estes excelentes profissionais que, muitas vezes, para além de ensinar, foram o nosso apoio, escutando-nos e ajudando-nos sempre que possível.

À minha família e amigos, por acreditarem sempre em mim e por fazerem com que desse sempre o meu melhor.

Validação do Questionário ACE (Validation of ACE Questionnaire)

Resumo

Experiências adversas na infância (ACE) são experiências que ocorrem na infância, tais como abuso, negligência e tipos de disfunção familiar, que aumentam o risco de problemas de saúde física e psicológica e afetam o desenvolvimento. As ACE são avaliadas normalmente através de uma entrevista semiestruturada. No entanto existem muitos instrumentos que completam o diagnóstico, como o Questionário das Experiências Adversas na Infância. Existem várias vantagens em analisar as propriedades psicométricas do instrumento e esta dissertação visa examinar a estrutura fatorial deste questionário.

Método: Foram utilizados dados da versão portuguesa do Questionário ACE. A amostra incluiu 383 adolescentes. A média de idades foi de 17 anos ($M = 16.52$, $SD = 1.74$), variando entre 13 e 23 anos (171 (44.6%) do sexo masculino e 212 (55.4%) do sexo feminino). **Resultados:** Aproximadamente metade da amostra relatou exposição a três/quatro ACE ($n = 192$; 50.1%). Considerando a análise fatorial confirmatória, os resultados mostraram que todos os modelos testados apresentaram baixos índices. Contudo, a análise da consistência interna revelou valores altos de alfa. **Conclusão:** Apesar do questionário ACE ser um dos instrumentos de autorrelato mais utilizados nesta área, a validade de construto requer mais estudos no sentido de se estreitar a relação entre o plano conceptual e o estatístico. Contudo, importa referir que ainda permanece em debate o melhor método para avaliar a validade de construtos que envolvem experiências, comparativamente a outros construtos. Consequentemente, os procedimentos tradicionais quando uma nova medida é desenvolvida, como confiabilidade interna e análise fatorial, podem não ser métodos apropriados para instrumentos que avaliam experiências de vida, e o nosso estudo parece corroborar essa hipótese. Alguns investigadores sugerem o teste-reteste como o melhor método, pelo que seria importante alargar o estudo e fazer esse tipo de análise.

Palavras-Chave: Experiências Adversas na Infância; Questionário ACE; Análise Fatorial Confirmatória; Características Psicométricas.

Abstract

Adverse Childhood Experiences (ACEs) are traumatic events in childhood, like abuse, neglect and kinds of serious household dysfunction, that can increase risk for physical or psychological health and development. ACEs are mostly evaluated with a careful semi-structured interview. However, there are many instruments that complete the diagnosis, like the ACE Questionnaire. There are several advantages to examining the psychometric properties of the instrument, and this dissertation aims to access and examine the factorial structure of this questionnaire. **Method:** We used a data from the Portuguese version of the ACE Study Questionnaire. The sample included 383 adolescents. The mean of the age was 17 years old ($M = 16.52$, $SD = 1.74$), ranged between 13 and 23 years old (171 (44.6%) males and 212 (55.4%) females). **Results:** Approximately half of the sample reported having been exposed at three/four ACE ($n = 192$; 50.1%). Considering fit indices models, results presented that all tested models presented poor fit. However, the analysis of internal consistency showed high alpha values. **Conclusion:** Although the ACE questionnaire is one of the most commonly used self-report instruments to assess this theme, construct validity requires further studies in order to narrow the relationship between the conceptual and statistical planes. However, they should be aware that the best method for assessing the validity of constructs involving experiments as compared to other constructs is still under debate. Consequently, traditional procedures when a new measure is developed, such as internal reliability and factor analysis, may not be appropriate methods for instruments that evaluate life experiences, and our study seems to corroborate this hypothesis. Some researchers suggest that test-retest may be the best method, so it would be important to extend the study and do this kind of analysis in the future.

Keys-Words: Adverse Childhood Experiences; ACE Questionnaire; Factorial Confirmatory Analysis; Psychometric Characteristics.

Index

Agradecimientos.....	iv
Resumo.....	v
Abstract.....	vi
Validation of ACE Questionnaire.....	8
Method.....	11
Results.....	14
Discussion.....	16
Conclusion.....	19
References.....	20

Developmental psychopathology helps to understand why some people maintain a normal developmental path, while others have distress and symptoms that interfere with their adaptation to life. This theory claims that the person's history and the experiences lived in their different contexts can constitute themselves as developmental risk factors and, therefore, increase the probability of developing disruption (Sroufe & Rutter, 1984). One of the mechanisms that have been linked between the childhood adverse experiences and later negative outcomes is called as allostatic load. The allostatic load model refers to the cost the body pays for the adaptation of responses to stress when this needs to be maintained for a long time, and include aspects of lifestyle, genetic influences and developmental effects such as early life experiences and adversities (Lupien, et al., 2015). The recognition that adverse experiences are not rare experiences has initiated researchers' interest in studying the prevalence of adverse experiences and the relation of this exposure to psychopathology.

Adverse Childhood Experiences (ACE) constitute extreme environmental threats to psychosocial and cognitive development (Rogosch, Dackis & Cicchetti, 2011). This concept has been defined as childhood experiences, varying in severity and frequency, occurring within a child's social or family environment that cause harm or distress, impacting on the child's physical or psychological health and development (Kalmakis & Chandler, 2014). The ACE Study (Felitti, et al., 1998) it was done at Kaiser Permanente and at CDC (Center for Disease Control and Prevention). Between 1995 and 1997, they asked 17,337 adults about their history of exposure. According to the available data on their website (2019), 46% of the participants were males, 46.4% aged 60 or older, in 19.9% of the participants the age ranged from 50 to 59, and 5.3% aged between 19-29 years old. Overall, more than half reported at least one of categories of childhood exposures. This exposure includes forms of child maltreatment that can be grouped on three categories: abuse, household challenges, and neglect. The prevalence of physical abuse was 28.3%, sexual abuse was reported by 20.7% of the participants, and emotional abuse by 10.6%. Additionally, emotional and physical neglect were reported, respectively, by 14.8% and 9.9% of the participants. Concerning household challenges, the more prevalent were household substance abuse (26.9%), parental separation or divorce (23.3%), and household mental illness (19.4%). Moreover, 12.7% of the participants reported that mother was treated violently and 4.7% reported an incarcerated household member. This study and the others that followed has shown that traumatic childhood experiences are extremely

common and have a profound impact on many different areas of functioning. They found that there was a dose-response relationship between ACEs and health outcomes: the higher their ACE score, the worse their health outcomes (Center for Disease Control and Prevention, 2016). However, there is no epidemiological study on the prevalence of ACE's in Portugal, the data we have has only been obtained by identified children from Child Protective Services (CPS). For instance, in the year 2017, the CPCJ accompanied a total of 69 967 children and young people (Comissão Nacional de Promoção dos Direitos e Proteção das Crianças e Jovens, 2018). However, it is thought that there are more than those that are identified.

There are real neurologic reasons why children exposed to high doses of adverse experiences are more likely to engage high-risk behavior. But even if they don't engage in high-risk behavior, they're still more likely to develop worse health conditions, and this is explained by the Hypothalamic-Pituitary-Adrenal Axis (HPA), the brain's and body's stress response system. Before of a real threat, the hypothalamus sends a signal to HPA axis which sends a signal to adrenal gland that release stress hormones like adrenaline and cortisol. And then, we are ready to either fight or run. But the problem is when happens very often, this system is activated over again, and it goes from being adaptive to health-damaging (Tsigos & Chrousos, 2002). Research has been focused on HPA systems and automatic nervous system, but it should be emphasized that the systems that help protect the body can also participate in pathophysiological processes when they are overused or inefficiently managed (McEwen, 1998; Lupien, et al., 2015).

Research have consistently replicated the findings of the ACE study, demonstrating the relationship between adverse childhood experiences and physical and psychological health conditions, health-risk behaviors, developmental disruption and even healthcare utilization (Kalmakis & Chandler, 2014). For instance, the physical health conditions include cardiovascular disease (Dong, et al., 2004), chronic lung disease (Anda, et al., 2008), headaches (Anda, Tietjen, Schulman, Felitti & Croft, 2010), autoimmune disease (Dube, et al., 2009), sleep disturbances (Kajeepeta, Gelaye, Jackson & Williams, 2015), obesity (Felitti & Anda, 2010), early death (Brown, et al., 2009) and general poor health (Shonkoff, et al., 2012). The psychologic conditions comprise depression, posttraumatic stress disorder (PTSD), suicidal ideation/attempts (Brockie, Dana-Sacco, Wallen, Wilcox & Campbell, 2015) and anxiety (Reiser, McMillan, Wright & Asmundson, 2014).

Additionally, people with history of ACE were more likely engaged in various health-risk behaviors like as smoke, binge drink (Campbell, Walker & Egede, 2016) and substance abuse (Dube, et al., 2003). Developmental disruption includes homelessness (Keeshin & Campbell, 2011) and in the case of woman, repeated abortions (Bleil, et al., 2011) and intimate partner violence (Whitfield, Anda, Dube & Felitti, 2003). Lastly, healthcare utilization includes more prescription medications (Anda, Brown, Felitti, Dube & Giles, 2008), decreased self-assessed quality of life and high healthcare utilization (Arnow, 2004), reduced health and functioning, family stress and dysfunction, societal economic losses because of disability, and financial burdens on the healthcare system (Afifi, et al., 2008). Therefore, early experiences are an important public health issue and it is important the prevention and early diagnosis.

Most evaluations of the ACE rely on retrospective reports from adults to collect information about childhood adversity. Adverse childhood experiences are mostly evaluated clinically with a careful semi-structured interview. However, there are many instruments that can complete the diagnosis such as questionnaires and interviews. Some of them are intended for screening and others for definitive appraisal (Fava, Sonino & Wise, 2011), some are designed to access a single type of trauma and others include many potential trauma areas. Interviews like Childhood Experience of Care and Abuse (CECA) (Smith, Lam, Bifulco, & Checkley, 2002), the Childhood Trauma Interview (CTI) (Fink, Bernstein, Handelsman, Foote & Lovejoy, 1995), the Early Trauma Inventory (ETI) (Bremner, Vermetten & Mazure, 2000), the Retrospective Assessment of Traumatic Experience (RATE) (Gallagher, Flye, Hurt, Stone & Hull, 1992) and the Retrospective Separation Experience Questionnaire (RSEQ) (Zanarini, Gunderson, Marino, Schwartz, & Frankenburg, 1989) are examples. Among the self-report questionnaires, the most common in literature are: The Assessing Environments III (AEIII) (Berger, Knutson, Mehm, & Perkins, 1988), the Childhood Abuse and Trauma Scale (CATS) (Sanders & Becker-Lausen, 1995), the Childhood Trauma Questionnaire (CTQ) (Bernstein, Ahluvalia, Pogge & Handelsman, 1997) and Adverse Childhood Experiences Questionnaire (ACE) (Felitti, et al. 1998).

Although there are many measures to access adversity in childhood, not all of them have good psychometric properties. The CTQ appears to be one of the most used and have respectable psychometric properties (Fava et al., 2011). Most of the above instruments

have psychometric qualities that are at least close to acceptable. However, the RSEQ is an example of instrument that haven't good psychometric properties (Roy & Perry, 2004).

However, a significant part of this measures only includes a few types of childhood maltreatment (e.g. physical abuse, psychological abuse, sexual abuse). Often these items are simply summed into a single composite, but lately studies often incorporate more advanced measurement techniques such as exploratory and confirmatory factor analyses to derive domain specific scales (Ford, et al., 2014). One of the measures that includes more than the assessments of a single experiences is the ACE Questionnaire that is designed for administration to young people, particularly aged 18 years, and older. Questions cover family dysfunction like substance abuse, mental illness, domestic violence, incarceration or jail, and divorce or separation; physical, sexual and emotional abuse and neglect by parents or caregivers. Although this questionnaire is one of the most used in this area, including by WHO, there is only one recent study (Ford, et al., 2014) that has been devoted to validating the factorial structure but only of 11 ACE items that have been administered on the BRFSS (The Behavioral Risk Factor Surveillance System).

There are several advantages to examining the psychometric properties of items in the ACE questionnaire. First, is one of the most complete instruments that include many childhood adverse experiences and family disfunction, and the items are operationalized in behaviors. Second, if the items are associated with several different factors, the way they are summarized could impact how those different factors interact and predict long-term health outcomes among adults and, lastly, to support the validity and reliability of group comparisons using latent constructs, a common metric must be used across groups. Therefore, this study aims to access and examine the factorial structure of the original ACE, as well as the internal consistency.

Method

Participants

A data from the Portuguese version of the ACE Study Questionnaire was used. The sample included 383 adolescents. The mean of the age of the sample was 17 years old ($M = 16.52$, $SD = 1.74$), ranged between 13 and 23 years old (171 (44.6%) males and 212

(55.4%) females). In total, 226 (59.0%) of the adolescents had been previously identified by Child Protective Services (CPS) due to exposure to adverse experiences. Regarding the level of education, the average was 9.36, that is the 9th grade level ($SD = 1.61$), ranged from the fourth grade and the 15th grade level.

Measures

Adverse Childhood Experiences Questionnaire (ACE)

A Portuguese version of the ACE Questionnaire (Felitti, et al., 1998) was used (Silva & Maia, 2008). ACE is a retrospective self-report measure which assesses the occurrence of adverse experiences in childhood. This questionnaire evaluate 10 different adverse childhood experiences organized in two areas: experiences directed against the child (physical, emotional and sexual abuse; physical and emotional neglect) and experiences of household dysfunction (domestic violence, household substance abuse, mental illness in the household, incarcerated household members, and parental separation/ divorce). For each category, if the subject scored positively in at least one of the items, he/she was defined as having been a victim of that experience. Responses range from 0 (never) to 4 (very often), except for sexual abuse and familiar disfunction, for which a dichotomous response (yes or no) was given and all items were dichotomized (as present or absent) based on how often the experiences occurred. If the experience was rated as having occurred “often” or “very often” then it was considered present. If the experience was rated as having occurred “sometimes”, “rarely” or “never”, it was considered absent (Felitti et al., 1998). With this scoring, the total amount of adverse experiences for each subject varied between zero to 10. The study of the original scale demonstrated good test-retest reliability for ACE score ($\kappa = .64$) (Dube, Williamson, Thompson, Felitti, & Anda, 2004), and the reliability of the ACE Study Questionnaire, Portuguese version, presented appropriate kappa values, ranging between .65 and .86 (Pinto, Correia & Maia, 2014).

Procedure

The first contact with the adolescents was made by the professionals in the institutions and schools who gave a general explanation of the purposes of the study, inviting them to participate in the study. After the participants agreed to participate, the researchers

scheduled the interviews. At this time, the written informed consent was given to the adolescents to be signed by parents or legal guardians, allowing them to participate in the study. After returning the parental informed consents, adolescents gave their informed consent to participate in the study. The data collection began only after delivery of both the signed consents. Therefore, the questionnaires were administered. All personal data was coded to ensure the anonymity.

Analysis

First, descriptive statistics were used to analyze the data distribution. Next, it was analysed a Confirmatory Factor Analysis (CFA) for the items of ACE using MPlus statistical modeling software (Version 6.12; Muthen & Muthen, 2011). After performing descriptive statistics, it was tested four alternative latent structures using CFA based on responses to the 36 items. In order to assess the goodness-of-fit for each model, a range of fit statistics were examined, including the Comparative Fit Index (CFI; Bentler, 1990), the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990), the Standardized Root-Mean-Square Residual (SRMR; Joreskog & Sorbom, 1996), and the chi-square adjustment adequacy test, where the null hypothesis is an indicator of good adjustment. However, the chi-square test is extremely sensitive to the size of the sample, and in large samples ($N > 200$) the test result tends to reject the null hypothesis. For this reason, due to the restrictiveness of the Model Chi-Square, researchers have sought alternative indices to assess model fit (Hooper, Coughlan, & Mullen, 2008). Therefore, the relative chi-square test χ^2/df (Wheaton, Muthen, Alwin, & Summers, 1977) has been used, in which a value lower than two is indicative of good adjustment (Tabachnick & Fidell, 2012). The extant literature suggests that a CFI/TLI above 0.95 indicate a good fit between the model and the data, and RMSEA values less than 0.05 indicate close fit. For the SRMR, values less than 0.06 indicating excellent fit and values less than 0.08 indicative of acceptable model fit. For the non-nested models, it was used the Bayesian Information Criterion (BIC; Schwarz, 1978) with the smallest value indicating the best fitting model. It was used the BIC and the Akaike Information Criterion (AIC) estimators to assess which overall model presented the best explanatory predictive power between the independent variables and the different cut-off score derived from each model.

The models tested were HdandOthers Model (which combines the five types of

household dysfunction, sexual, physical and emotional abuse, physical and emotional neglect), HD + Ab + Neg Model (which combines the five types of household dysfunction, the three types of abuse and the two types of neglect), HD + SA + N/A Model (which combines the five types of household dysfunction, sexual abuse, emotional and physical neglect/abuse) and HD + EN/EA + PA/SA + PN Model (which combines the five types of household dysfunction, emotional neglect/abuse, physical and sexual abuse, and physical neglect).

According to literature, Alpha is a general version of the Kuder-Richardson coefficient of equivalence because the Kuder-Richardson coefficient applies only to dichotomous items, whereas alpha applies to any set of items regardless of the response scale (Cronbach, 1951). To interpret alpha as a signal of reliability, the set of items has to be measures of the same latent variable and this is only one variable (homogeneity) and the factor loadings have to be the same. Together, these assumptions are called "essential tau-equivalence" (Cronbach, 1951). Therefore, Cronbach's alpha (Cronbach, 1951) was used to estimate the internal consistency of the dimensions. It provided an overall measure of the interrelatedness among the items comprehend each dimension. The magnitude of alpha coefficients can range from 0 to 1, where higher values demonstrate greater reliability. Values of Cronbach's alpha greater than 0.6 were considered to reflect an acceptable level of reliability (Streiner, 2003).

Results

Approximately half of the sample reported having been exposed at three/four traumatic events ($n = 192$; 50.1%). The exposure ranged from two ($n = 10$; 2,6%) to 10 events ($n = 3$; 0.8%) ($M 4.77$; $SD = 1,72$), within 10 possible events. Specifically, three hundred and forty-seven adolescents (90.6%) reported emotional abuse, ninety-seven (25,3%) reported physical abuse and sixty-two reported sexual abuse (16,2%). Most of the sample also reported having been exposed to emotional ($n=332$, 86,7%) and physical ($n=375$, 97,9%) neglect. Lastly, less than a half of the sample reported experiences of household dysfunction, being that parental separation or divorce was the most revealed ($n=164$, 42,8), followed by household substance abuse ($n=162$, 42,3%), mental illness or suicide in the household (123, 32,1%), domestic violence ($n=103$, 26,9%) and incarcerated household members ($n=61$, 15,9%).

Considering fit indices models, results showed that all tested models presented poor fit. Specifically, all models presented a relative chi-square value higher than two, which

indicates a poor adjustment. Considering CFI and TLI values none of the models presented values above .95. Considering RMSEA values, none of the models present a close fit, because values are higher than the .05 recommended value. For the SRMR all models presented values higher than the 0.06, which indicates a poor fit. Considering the whole model including all variables, the logistic regression analyses showed that the HDandOthers Model presented the highest CFI and TLI values (.83 and .81 respectively), the lowest relative chi-square value ($\chi^2 = 3.31$), and the lowest RMSEA and SRMR (.07). The fit statistics for the four competing CFA models are presented in Table 1. Therefore, the HDandOthers Model revealed a better fit than the other models.

Table 1
Fit Indices of Factor-Analytical Models

Models	Chi-Square	CFI	TLI	AIC	BIC	RMSEA	SRMR
HDandOthers	3.31	0.827	0.812	29222.896	29708.505	0.074	0.074
HD + Ab + Neg	4.58	0.727	0.709	29989.359	30427.591	0.093	0.092
HD + SA + N/A	4.15	0.759	0.744	29737.654	30175.886	0.087	0.085
HD + EN/EA + PA/SA + PN	3.69	0.797	0.781	29451.695	29917.563	0.080	0.079

Note. $N = 383$.

HD = household dysfunction. Ab= abuse. Neg = neglect. SA = sexual abuse. N/A= neglect/abuse. EN/EA = emotional neglect/emotional abuse. PA/SA = physical and sexual abuse. PN= physical neglect. RMSEA = Root Mean Square Error of Approximation. CFI = Comparative Fit Index. TLI = Tucker-Lewis Index. SRMR = Standardized Root Mean Square Residuals. AIC = Akaike Information Criterion. BIC = Bayesian Information Criterion.

Internal consistency results

Results for this analysis are presented in Table 2. Composite scores for each of the ACE scales were then computed for every participant in the sample by summing the responses for each of the items comprising the scale. Considering the magnitude of the correlations among the six factors in the CFA results, an Overall ACE score was also created for each participant by summing the responses of all the ACE items.

Table 2
Range of Descriptive Statistics and Internal Consistency of Responses for Each of the Composite Scores of the ACE Questionnaire.

Scale name	# Items	Scale mean	Scale SD	Cronbach's α
Household Dysfunction	10	3.85	5.06	.83
Emotional Abuse	9	8.66	8.61	.89
Physical Abuse	4	3.48	4.36	.90
Sexual Abuse	4	.38	.99	.86
Emotional Neglect	4	5.13	4.25	.77
Physical Neglect	5	2.76	3.50	.68

Note. $N = 383$.

Discussion

The overall aim of this study was to assess and validate the factor structure of the Adverse Childhood Experience (ACE) questionnaire. A confirmatory factor analysis was used to validate the initial factor structure of the ACE Questionnaire as well as to determine whether it may be appropriate to combine these lower order scales to create an overall composite score. All models generally fit the data poor in contrast to the previous study (Ford et al., 2014) that found good fit indices. However, this previous study only used a few items of the ACE and that results seems not be enough to contribute for the validation of the overall ACE as a valid and a reliable measure. Additionally, the analysis of internal consistency showed that the items comprising each of the scales were found to be related to one another with alphas ranging from 0.68 (Physical Neglect) to 0.90 (Physical Abuse). These results agree with the previous studies (Ford et al., 2014) that showed high alpha values.

Despite the poor indices of all models, the HDandOthers model is slightly better than other models. This data can be useful for future studies. Taken together, the results of these analyses suggest that these items can be used to generate six composite scores estimating levels of exposure to Household Dysfunction, Emotional, Physical and Sexual Abuse, and Physical and Emotional Neglect. Despite this model fit the data better than the other models, in overall all tested models had poor fit indices. These findings may be explained by the characteristics of the variables that are considered in the present study, as some particularities of the life experience measures, which have a critical effect on their development and evaluation. Although the reflective model leads the psychological measures (e.g., Coltman, Devinney, Midgley, & Venaik, 2008), life experience measures seem to be nested in the formative model (Bollen & Bauldry, 2011). Theoretically, in a reflective model, the latent construct exists independent of the measures (Borsboom,

Mellenbergh & Van Heerden, 2004), like measures of attitudes and personality that are measured by eliciting responses to indicators. In contrast, in a formative model the latent construct is dependent upon a constructivist, operationalist or instrumentalist interpretation by the scholar (Borsboom, Mellenbergh & Van Heerden, 2003). In this model, items do not need to share a common theme; furthermore, according to Netland (2005), life experiences' categorization should be conceptual, and they are not interchangeable. As claimed by other researchers (e.g., Hooper, Stockton, Krupnick, & Green, 2011) there are not strong reasons to hypothesize that people who experience one type of event would necessarily experience other specific events. Consequently, traditional procedures that used to be essential when a new measure was developed and tested, such as internal reliability and factorial analysis, may not be appropriate methods for measures of life experiences (Hooper, Stockton, Krupnick, & Green, 2011), and our study seems to corroborate this hypothesis.

The best strategy to score life experiences remains as a vivid debate. Paykel (1983) argued that normative techniques reduce sensitivity, while subjective techniques increase proneness to bias. The ACE Study rely on the occurrence of specific experiences or on the total counting of the lived experiences. Again, these options are not free of criticisms, mainly stressing that experiences should not be equally treated, and an effort should be made to distinguish them (e.g., Paykel, 1983). Nonetheless, these alternatives are not necessarily mutually exclusive. For instance, when assessing a life experience such as *divorce* it is important not only to ask about it occurrence, but also to collected personal appraisals.

Additionally, some authors have questioned the reliability of self-reports of adverse experiences, suggesting that psychopathology at the time of evaluation affects self-report (e.g. Fergusson, Horwood, and Woodward, 2000). However, not all evidence confirm this speculation because some studies found that test-retest reliability in the responses to questions about adverse childhood experiences as well as the resulting ACE score to be good and moderate to substantial (Dube, Williamson, Thompson, Felitti, & Anda, 2004). In particular, other study found good to excellent agreement, with no significant correlation between the changes in self-reported experiences and the changes in physical and psychological symptoms, suggesting that the reliability of reports is not related to the health state at the time of the report (Pinto, Correia & Maia, 2014). These findings propose that retrospective responses to childhood maltreatment and related forms of serious

household dysfunction are generally stable over time and are not necessarily affected by the psychopathology at the time of evaluation. According to Dube, Williamson, Thompson, Felitti, and Anda (2004), reliability means that a report is stable across time, while validity assesses its veracity. Overall, in this field of research, not all experiences can be externally verified (e.g., Fowler, 1995; Kreuter, Yan, & Tourangeau, 2008; Maughan & Rutter, 1997), consequently research about validity is quite narrow. Contrary, reliability or consistency allows for different and easier designs, i.e., test-retest using the same method of data collection or different methods, which extends the research opportunities. Therefore, the test-retest method seems to be the most appropriate way to assess the reliability of self-reported trauma experiences (MacKenzie, Podsakoff and Jarvis 2005; Norris and Hamblen 2004) and is preferred to other reliability methods, such as Cronbach's alpha.

This study, like several lines of investigation of child maltreatment, was based exclusively on self-report data, with its obvious limitations. Childhood trauma and adverse experiences are often sensitive and potentially cause anxiety when reporting. As a result, the respondent's readiness to respond immediately is likely to be influenced (Tourangeau & Yan, 2007). In addition, exposure to ACE is retrospectively assessed. Memory bias or other coping developed as a result of persistent abuse may affect the accuracy of the individual's self-report (Edwards, Holden, Felitti & Anda, 2003). Additionally, the sample only consisted of Portuguese adolescents from high-risk contexts. Further research should consider an increased heterogeneity of participants, such as community and clinical settings to replicate and extend these findings. The current study only examined the factorial structure and the internal consistency of the instrument. Future research should continue to study the predictive relationships between ACEs and health outcomes and demonstrate the utility of these domain-specific scales in identifying protective processes that may help prevent these experiences.

In the words of Dr. Robert Block, the former President of the American Academy of Pediatrics "Adverse Childhood Experiences are the single greatest unaddressed public health threat facing our nation.". Therefore, ACEs can be prevented. There are five known strategies that can be implemented in our community: strengthening economic support for families, by changing social norms to support parents and positive parenting, by providing quality care and education early in life, by enhancing parenting skills to promote healthy child development and by intervening to lessen harms and prevent future risk (Fortson,

Klevens, Merrick, Gilbert & Alexander, 2016). It's true that putting a stop to ACEs is no small task, but it's a goal that we all must work toward.

Conclusion

Adverse Childhood Experiences are common in the population (Anda, 2006) and approximately half of our sample reported having been exposed at three/four ACE (n = 192; 50.1%). Although our sample only consisted of Portuguese adolescents from high-risk contexts, the original ACE study was done in a population that was 70% caucasian and college-educated, which means that not only the most disadvantaged groups are affected by this problem. This substantial exposure to ACEs, along with their profound and long-term effects on health and quality of life, emphasizes the need for reliable measures of child abuse, neglect and household dysfunction. We need to recognize this to be a public health crisis and then we can use tools to come up with solutions.

About the instrument, considering that some current literature suggest that test-retest might be the best method to assess the psychometric properties of the ACE, it would be important to extend the study and make this type of analysis. However, it was not possible given the time set for the end of this project. Given the controversy of self-report stability and given the information previously described, it would be important for future studies to evaluate the test-retest. In sum, the instrument showed low adjustment indices but showed good internal consistency indices. So, can we use the questionnaire or not? It can be used because probably the poor results suggest that the proposed structure might not be the best characterization to evaluate the construct. However, we need to continue studying the factorial validity of the ACE.

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