

DEVELOPMENT AND PSYCHOMETRIC PROPERTIES OF ADVERSE CHILDHOOD EXPERIENCES SCALE FOR ADOLESCENTS

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ABSTRACT

Objective: To develop a scale and establish psychometric properties to measure Adverse Childhood Experiences of Adolescents in Urdu language.

Study Design: Cross sectional analytical study.

Place and Duration of Study: Department of Psychology, University of Gujrat, from Dec 2019 to Oct 2020.

Methodology: After the approval of proposal initial item pool of 145 items was generated with the help of DSM-5, extensive literature review and focus group interviews (Girls=25, Boys=25). Expert evaluation shortens it into 137 items whereas pilot study retained 132 items for final administration. Data was obtained from 1331 adolescents with age range of 12-19 from educational institutions and community in district Gujrat. Exploratory Factor Analysis, Confirmatory Factor Analysis and reliability analysis were carried out to analyze the data.

Results: Exploratory factor analysis explored 38 reliable items for Adverse Childhood Experiences scale under four sub factors; Sexual Abuse, Neglect, Physical Abuse, and Psychological Abuse whereas 12 items were confirmed for final scale through model fit (p -value=0.000, CFI=0.968, GFI=0.975, AGFI=0.959, RMSEA=0.049) of Confirmatory Factor Analysis.

Conclusion: A scale to estimate Adverse Childhood Experiences of adolescents in Urdu language is competently developed and established with 12 questions and four sub-scales.

Keywords: Adverse childhood experiences, Confirmatory factor analysis, Exploratory factor analysis.

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INTRODUCTION

In order to have a fully functioning society, it's important to prevent early life adversities such as Adverse Childhood Experiences. Adverse Childhood Experiences are stressful or traumatic events experienced before age 18. These experiences are potentially traumatic events that can have negative, lasting effects on health and well-being. Adverse Childhood Experiences range from physical, emotional, or sexual abuse to neglect¹. According to American Psychiatric Association (2013) any non-accidental physical damage to child by parents or other major figures such as blowing, hitting, kicking or booting, is related to physical abuse. It is ranges from minor scratches to fractures and even death. Sexual abuse includes any sexual assault of child by parents, other significant people or care providers to obtain

sexual gratification and satisfaction. Furthermore, any verbal or symbolic act such as rebuking, disapproving, humiliating or threatening the child by parents, care providers or significant figures, that can have psychological harm is called psychological abuse. Whereas, child neglect is related to ignored or overlooked behaviour and attitude of the parents, caregivers or other significant people that results in deprivation of age appropriate needs which ultimately effects physical and psychological health of the child².

Several researches have demonstrated that our youth is confronting with Adverse Childhood Experiences (ACEs) significantly. Findings of these studies range from 25% in United Kingdom to more than half of the youth in other countries like US and Brazil. Moreover, 20-70% children were going through multiple adverse childhood experiences³⁻⁵. Recent community surveys in Europe and all over the world indicated high prevalence of emotional abuse (29.1%), physical abuse

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(22.9%), sexual abuse (9.6%), physical neglect (16.3%) and emotional neglect (18.4%)⁶.

Adverse childhood experiences have drastic effect on the life of children and adolescents and can increase the chances of physical diseases and psychological problems⁷. Despite of detrimental physical and mental health consequences, the screening of Adverse Childhood experiences in adolescents is inconsistent^{8,9}. One valid reason of low screening rate is unavailability of appropriate assessment instrument for this population. Few scales are available which have been sufficiently developed and validated in western cultures¹⁰. With particular reference to Pakistan, there is dearth of indigenous assessment tools to measure ACEs which become a hurdle for researchers. Although, translated versions of western developed scales have been used in studies but due to cultural differences biasness is a possible risk which may effect the appropriate response. According to Ashton¹¹, tools developed and validated in developed countries may not be translated and used in developing countries due to differences in experiences and sociocultural situations. Furthermore, researches indicated that perception of adversity and maltreatment differs significantly even within developed societies on cultural, racial and ethnic background^{12,13}. Therefore, there is a great need to develop a scale to measure Adverse Childhood Experiences which is suitable for Pakistani culture. In this way, we can have actual estimation of prevalence of adverse childhood experiences unmarked as Emery and Laumann-Billings¹⁴, indicated that much of adversity and violence happening in families remains behind the doors which are closed. That's why present study was carried out to develop and validate indigenous scale of Adverse Childhood Experiences and it would be a commendable contribution in the psychological assessment field of the world especially for developing countries and particularly in Pakistan.

METHODOLOGY

According to Anastasi and Urbina¹⁵, item generation is the most significant part of scale

development procedure. Consequently, DSM-V was followed for the generation of items for Adverse Childhood Experiences scale which illustrated four essential components: Physical Abuse, Sexual Abuse, Psychological Abuse and Neglect² (fig-1).

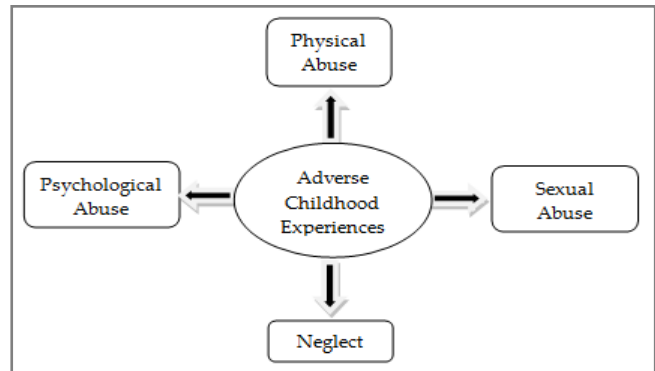


Figure-1: DSM-5 model of adverse childhood experiences.

The accessible literature related to adverse childhood experiences was evaluated and used for item generation. Some secondary items were extracted from the available scales on the targeted variables. All the items of scale were in Urdu language. Furthermore, to gather information from adolescents focus group interviews were conducted. A total of 50 adolescents (25 girls & 25 boys) with age range 12-19, included in order to explore the phenomenology. At the end suitable items were generated according to the general population's experiences and opinions. The finalized initial item pool for Adverse Childhood Experiences scale contained 145 items. Evaluation of the items by experts was the next step in scale development procedure. After explaining the nature and purpose of study, the initially developed item pool was given to 5 PhD subject experts who had comprehensive knowledge about targeted constructs. These experts were asked to evaluate each item with respect to its importance, relevancy, adequacy and appropriateness. Moreover, the experts were requested to consider the clarity and vagueness issues of items. On the basis of expert's suggestion and recommendations initial item pool was reorganized. Some items remained same, some were changed and some were eliminated. In Adverse Childhood Experiences scale 8

items were eliminated, whereas 23 items were changed or reworded. At the end 137 items endured for the pilot study. Furthermore, the expert panel decided response categories on four points likert scale ranges from 1 to 4. The pilot study was conducted to check the ambiguities and difficulties in the newly developed Adverse Childhood Experiences Scale among the target population. This study was carried out on the sample of 100 adolescents (Girls=50, Boys=50) with age ranges of 12-19. The convenient sampling technique was used to obtain this sample from district Gujrat. The analysis confirmed 132 reliable items for final administration with four subscales; Physical Abuse, Psychological Abuse, Sexual Abuse and Neglect. This research was carried out after the approval of ethics committee of the department of Psychology, University of Gujrat. The final scale was administered on 1331 participants from different institutions and community. Written and oral informed consent was obtained from participants after explaining the nature, purpose and significance of the research. Respondents were ensured about their right of privacy and confidentiality. They also knew that they can

on 1331 participants. After exploratory factor analysis and confirmatory factor analysis 12 items scale of Adverse Childhood Experiences retained from 132 items.

The adequacy of the sample was checked using KMO and Bartlett's Test of Sphericity. Findings demonstrated KMO value of 0.85 which means that sample is highly adequate and data can be accepted for further analysis as Bartlett's Test of Sphericity is also significant (table-I)

Table-I: Kaiser-meyer-olkin measure of sampling adequacy (KMO) and bartlett's test of sphericity for adverse childhood experiences scale for adolescents (n=1331).

Measure	KMO	Bartlett's Test of Sphericity
Adverse Childhood Experiences Scale for Adolescents	0.85	0.000

The table-II indicated that Adverse Childhood Experiences Scale consists of four subscales; Sexual Abuse, Neglect, Physical Abuse and Psychological Abuse. The item number 57, 116 and 118 was confirmed under the factor of Sexual abuse whereas, neglect factor retain item no 1, 78

Table-II: Factor loading of adverse childhood experiences scale for adolescents (n=1331).

Item No.	Sexual Abuse	Item No	Neglect	Item No	Physical Abuse	Item No	Psychological Abuse
57	0.637	1	0.600	4	0.759	56	0.685
116	0.624	78	0.817	6	0.689	63	0.587
118	0.677	91	0.864	27	0.613	73	0.697

Table-III: Model fit summary of 15items (n=1331).

Model Fit Summery					
p-value	Adjusted Goodness of Fit Index	Goodness of Fit Index	Comparative Fit Index	Root Mean Square Error of Approximation	Root Mean Square Residual
0.000	0.959	0.975	0.968	0.049	0.029

withdraw research process at any stage without any explanation. Detailed instructions were given to the respondents regarding items and response options. Participants were motivated to ask questions if they have difficulty in comprehending any item. At the end respondents were acknowledged for their participation and cooperation.

RESULTS

The initially finalized Adverse Childhood Experiences scale of 132 items was administered

and 91 during analysis. Furthermore, item no 4, 6, 27 and item no 56, 63, 73 consider reliable under the factor of Physical Abuse and Psychological Abuse respectively. Each such scale contained 3 items (fig-2).

Table-II indicated results of Confirmatory Factor Analysis (CFA) on 12 items of Adverse Childhood Experiences scale (ACES). Findings illustrated Comparative Fit Index (CFI) value as 0.968 which was in the acceptable limit.

Moreover, Goodness of Fit Index (GFI) value, AGFI value and Root Mean Square Error of Approximation (RMSEA) value were 0.975, 0.959 and 0.049 respectively, which confirmed the effecti-

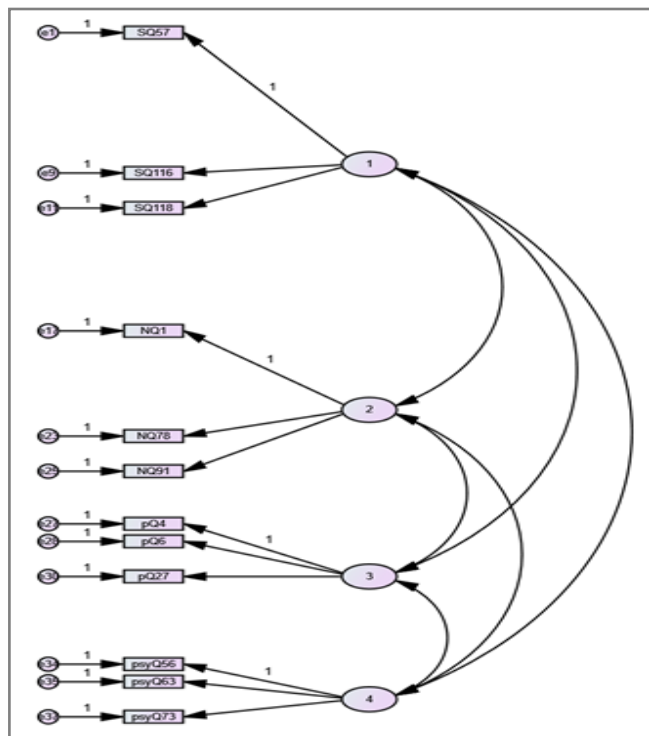


Figure-2: confirmatory factor analysis 12 items (n=1331).

veness of newly developed scale. The proposed model was significant at *p*-value of 0.000. Overall, Confirmatory Factor Analysis confirmed the model of Adverse Childhood Experiences scale with four factors such as Sexual Abuse, Neglect, Phy-

Table-IV: Reliabilities of the subscales (n=1331).

Sub Scales	Total Items	Cronbach Alpha r
Sexual Abuse	3	0.895
Neglect	3	0.709
Physical Abuse	3	0.806
Psychological Abuse	3	0.707
Total	12	0.857

sical Abuse and Psychological Abuse.

To check the reliability of the scale and subscales Cronbach alpha was computed. Cronbach alpha value of complete scale was 0.857 whereas reliability of Sexual Abuse, Neglect, Physical Abuse and Psychological Abuse was 0.895, 0.709, 0.806 and 0.707 respectively. All the values of reli-

ability analysis were above the acceptable limit which is 0.70.

DISCUSSION

The present study was conducted to develop and establish psychometric properties of the indigenous Adverse Childhood Experiences scale for adolescents as there is dearth of such instruments in Pakistan. It was necessary because tools developed in one culture may not be suitable and valid for other cultures and population which increased the chances of biasness in findings^{16,17}.

The initial item pool was consisted of 145 items and then 8 items were deleted after expert evaluation. Pilot study on 137 items retained 132 reliable items for final administration. To establish the factor structure of the newly developed indigenous scale, Exploratory Factor Analysis (EFA) was computed. Construct validity of scales has been extensively determined through EFA. This technique significantly distributes items into meaningful factors and finds association among observed variables¹⁸. Final scale of 132 items administered on 1331 participants' age ranges from 12 to 19. The sample size was adequate as for factorial analysis, five participants per item is the minimum limit¹⁹. Exploratory factor analysis retained 38 valid items under four sub factors. Items with value of greater than 0.5, were included as it met the standard criteria of significant factor loading²⁰. Factors were explored with the help of varimax rotation method. The value of Kaiser-Meyer-Olkin was 0.85 which indicated that sam-ple is adequate for current study whereas Bar-tlett's test of sphericity is also significant which demonstrated that there was significant variance among responses of participants^{21,22}.

Factors explored during Exploratory Factor Analysis were validated through confirmatory factor analysis (CFA) on Amos graphics 7. CFA confirmed the 12 items scale with four sub factors; Sexual Abuse (3 items), Neglect (3 items), Physical Abuse (3 items) and Psychological Abuse (3 items) as proposed by EFA. All these identified sub factors were well defined, clear and theoretically relevant to the main construct.

The model fit values of the generated scale were; GFI = 0.975, AGFI = 0.959, and CFI = 0.968 which are best because model is best fitted if these values are above 0.90. Whereas values of RMSEA = 0.049 and RMSR = 0.029 were also fine as these values are below 0.05²¹. Overall, findings indicated the best model fit of the Adverse Childhood Experiences Scale as all values of the model were within the appropriate limits²³.

The Cronbach alpha value of the 15 items complete scale was 0.857 whereas subscale of Sexual Abuse, Neglect, Physical Abuse and Psychological Abuse has the reliability of 0.895, 0.709, 0.806, 0.707 respectively. Reliability values of scales and subscales are within acceptable limit²⁴.

Data Analysis

Obtained information and data was analysed by the means of reliability analysis, exploratory factor analysis and confirmatory factor analysis with the help of Statistical Package for Social Sciences (SPSS-22) and Analysis of a Moment Structures (AMOS-22) for windows.

CONCLUSION

A scale to estimate Adverse Childhood Experiences of adolescents in Urdu language is competently developed and established with 12 questions and four sub-scales.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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