



RESEARCH ARTICLE

REVISED Association of adverse childhood experiences with functional identity and impulsivity among adults: a cross-sectional study [version 2; referees: 2 approved, 1 approved with reservations]

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v2 First published: 08 Nov 2017, 6:1978 (doi: [10.12688/f1000research.13007.1](https://doi.org/10.12688/f1000research.13007.1))
 Latest published: 18 May 2018, 6:1978 (doi: [10.12688/f1000research.13007.2](https://doi.org/10.12688/f1000research.13007.2))

Abstract

Introduction: The present study explores the association of adverse childhood experiences with impulsivity and functional identity among Pakistani adults.

Methods: In this cross-sectional study, 260 Pakistani medical students aged 18 and above were approached. A consent form, a questionnaire on sociodemographic characteristics, and an English versions of the Adverse Childhood Experiences (ACE) scale, Functions of Identity scale (FIS) and Barratt’s Impulsiveness Scale (BIS-11) was employed in this study. All data were analyzed in SPSS v. 20.

Results: A total of 122 (52.6%) of respondents had experienced at least one adverse childhood experience. Verbal, physical, sexual adverse events and poor support and affection from family were the most reported adverse events. ACE scores yielded a significantly positive association with cognitive stability, perseverance and motor impulsivity on the Barrat’s impulsivity scale. Whereas, it yielded negative association with structure and harmony subscales of the functional identity as well as cognitive complexity subscale of the impulsivity scale.

Conclusions: A high proportion of Pakistani medical students reported adverse childhood experiences, which lead to impulsive behaviors and poor functional identities.

Keywords

adverse childhood, impulsivity, identity, Pakistan, abuse

Open Peer Review

Referee Status:

	Invited Referees		
	1	2	3
version 2 published 18 May 2018		 report	 report
version 1 published 08 Nov 2017	 report	 report	

- 1 **Usman Ali** , Fauji Foundation Hospital, Pakistan
- 2 **Syeda Fariha Iram Rizvi**, Govt, M A O College, Pakistan
- 3 **Muhammad Shahzeb Khan**, John H. Stroger, Jr. Hospital of Cook County, USA

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Comments (0)

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Author roles: **Haaris Sheikh M:** Conceptualization, Data Curation, Formal Analysis, Supervision, Validation, Writing – Review & Editing; **Naveed S:** Conceptualization, Data Curation, Formal Analysis, Supervision, Writing – Review & Editing; **Waqas A:** Conceptualization, Data Curation, Formal Analysis, Supervision, Validation, Writing – Review & Editing; **Tahir Jaura I:** Data Curation, Formal Analysis, Writing – Original Draft Preparation

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

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How to cite this article: Haaris Sheikh M, Naveed S, Waqas A and Tahir Jaura I. **Association of adverse childhood experiences with functional identity and impulsivity among adults: a cross-sectional study [version 2; referees: 2 approved, 1 approved with reservations]** *F1000Research* 2018, **6**:1978 (doi: [10.12688/f1000research.13007.2](https://doi.org/10.12688/f1000research.13007.2))

First published: 08 Nov 2017, **6**:1978 (doi: [10.12688/f1000research.13007.1](https://doi.org/10.12688/f1000research.13007.1))

REVISED Amendments from Version 1

The manuscript has been revised in line with reviewers' comments. Objectives and methods of the study have been clarified. Multiple regression analysis has been replaced with partial correlations.

See referee reports

Introduction

The Centers for Disease Control and Prevention (CDC) report a high prevalence of physical (28%) and sexual abuse (21%) associated with an unstable living environment among the American youth¹. Previous studies demonstrate a significant relationship between experience of abuse and physical, behavioral and social problems among the youth¹. Although there is abundant data exploring the prevalence of adverse childhood experiences in higher income countries, in low and middle income countries (LAMI) data is more scarce². Moreover, a paucity of data has been identified in the LAMI, necessitating the need to transculturally translate the impact of adverse childhood events (ACEs) on social, cognitive and emotional impairment and adoption of high risk behaviors³.

Childhood emotional mistreatment; particularly emotionally abusive acts, has been found to be associated with increased odds of lifetime diagnoses of several mental disorders⁴. The early, prolonged, and severe trauma can also increase impulsivity, diminishing the capacity of the brain to regulate emotions. Neurobiological studies show that childhood mistreatment leads to failure of inhibitory processes ruled by the frontal cortex over a fear-motivated hyper-responsive limbic system⁵. Therefore, impulsivity is a double edged sword, presenting itself as sequela of trauma as well as a risk factor for the development of a pathological response to trauma⁶. Many psychiatric disorders feature impulsivity, including substance-abuse disorders, attention deficit hyperactivity disorder, borderline personality disorder, conduct disorder and mood disorders. Impulsivity has also been associated with suicidal behaviors within various psychiatric populations exhibiting low serotonergic activity⁷. In mental health disorders especially substance use disorders, superimposition of the behavioral aftermaths of ACEs on impulsivity potentiate the risk of alcohol abuse by many folds⁸.

Similarly, previous studies have also established an association between ACEs and development of identity in adolescence. Development of a stable identity is a major developmental task, with its changing facets responsible for shaping the attachment styles and self-esteem in adolescence^{9,10}. Serafini and Adams describe the importance of identity in providing structure for higher self-esteem and positive self-image; providing the goals necessary for self-direction¹¹. This provides a sense of free will; harmony for social and academic adjustment; and future orientation that manifests as achievements in academia, aspirations and determination¹¹. To address the gaps in scientific literature, the present study explores the association of adverse childhood experiences with demographics, subsequent impulsivity and functional identity among Pakistani adults.

Methods

This study was designed as a cross-sectional study, where 260 medical students aged 18 and above and currently enrolled in King Edward Medical University and CMH Lahore Medical College & Institute of Dentistry, both in Lahore, were conveniently interviewed from April to May, 2017. Institutional review board approval was sought and obtained from the Ethical Review Board of CMH Lahore Medical College, Pakistan (approval number: 21/ERC/CMHLMC). A consent form, an anonymous questionnaire on sociodemographic characteristics, and English versions of the Adverse Childhood Experiences (ACE) scale, Functions of Identity scale (FIS) and Barratt's Impulsiveness Scale (BIS-11) were employed in this study. Participation in this study was voluntary and written informed consent was obtained from all participants. The participants were ensured anonymity and that only group findings would be reported.

The Adverse Childhood Experiences (ACE) questionnaire is an important assessment tool that measures multiple types of abuse and adverse experiences that one may have encountered as a child¹. It assesses adverse childhood experiences related to abuse (physical, psychological and sexual); neglect (emotional and physical) and household dysfunction (alcoholism or drug use at home, loss of biological parent, mental illness in home, violent treatment by mother and imprisoned household member). Responses to the ACE are recorded on a dichotomous scale (yes/no) and then scores are summed with higher scores corresponding to a higher number of ACEs. It has exhibited adequate reliability (Cronbach's alpha 0.6 to 0.8) and validity in previous study¹.

The Functions of Identity Scale (FIS) is a valid and reliable 5-point Likert scale, comprising 15 questions that assess five domains of psychological functions that identity serves for an individual: structure, goals, personal control, harmony and future¹¹. Higher scores on these subscales correspond to a stronger sense of identity.

Barratt's Impulsiveness Scale (BIS-11) is a 30-item self-report Likert scale, with seven subscales; attention, motor, self-control, cognitive complexity, perseverance, and cognitive instability¹². Higher scores on the scale or its subscales correspond to worsening impulsivity. All of these scales were found to be reliable in the present sample with following Cronbach's α ; ACE (0.71), FIS (0.86) and BIS-11 (0.78).

All data were analyzed in SPSS v. 21. Descriptive statistics were computed for the whole data. Frequencies were calculated and reported for ten domains of ACE, impulsivity and functions of identity. Partial correlations were run to assess the association of impulsivity and functions of identity with ACEs, adjusting for gender, age and socioeconomic status.

Results

A total of 232 medical students (232/260= 89.2%) responded to the surveys. The majority of them were females (n=188, 81%), with a mean age of 21.22 ± 1.31 years, mean number of siblings 3 ± 1.46 , mean order of birth 1.94 ± 0.78 and a mean income greater than 30,000 PKR (n=208, 89.7%). Mean scores on subscales of Functional Identity Scale and Barratt's Impulsiveness Scale are given in [Table 1](#).

Mean score (SD) on the ACE scale was 1.37 (1.75). A total of 122 (52.6%) respondents had experienced at least one ACE. Verbal, physical, sexual adverse events and poor support and affection from family were the most reported adverse events. A significant proportion of respondents cited verbal (34.5%),

physical (22.0%) and sexual abuse (15.5%), poor family support (19.0%), neglect (9.9%), separation/divorce of parents (4.7%), and witnessed domestic abuse (11.2%), substance abuse (3.9%), mentally or suicidal patient in the family (11.2%) and criminal background (4.7%). Detailed statistics are presented in [Table 2](#).

Table 1. Mean scores on subscales of the Functional Identity Scale.

Subscale	Mean	Std. Deviation
Functional Identity Scale		
Structure	11.14	2.5
Harmony	12.27	2.3
Goals	11.59	2.6
Future	11.00	3.0
Personal Control	11.78	2.1
Barrat's Impulsiveness Scale		
Attention	11.46	2.9
Cognitive instability	7.47	2.1
Motor	16.50	3.9
Perseverance	7.57	2.0
Self-control	13.13	3.4
Cognitive complexity	12.14	2.6
Attention	18.93	3.9
Motor	24.08	4.8
Non-planning	25.27	4.9

Table 2. Adverse childhood experiences reported by respondents.

Adverse childhood experiences	Response	Count	Column N %
Did a parent or other adult in the household often? Swear at you, insult you, put you down, or humiliate you? <u>or</u> Act in a way that made you afraid that you might be physically hurt?	No	152	65.5%
	Yes	80	34.5%
Did a parent or other adult in the household often: Push, grab, slap, or throw something at you? <u>or</u> Ever hit you so hard that you had marks or were injured?	No	181	78.0%
	Yes	51	22.0%
Did an adult or person at least 5 years older than you ever: Touch or fondle you or have you touch their body in a sexual way? <u>or</u> Try to or actually have oral, anal, or vaginal sex with you?	No	196	84.5%
	Yes	36	15.5%
Did you often feel that no one in your family loved you or thought you were important or special? <u>or</u> Your family didn't look out for each other, feel close to each other, or support each other?	No	188	81.0%
	Yes	44	19.0%
Did you often feel that you didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? <u>or</u> Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?	No	209	90.1%
	Yes	23	9.9%
Were your parents ever separated or divorced	No	221	95.3%
	Yes	11	4.7%
Was your mother or stepmother: Often pushed, grabbed, slapped, or had something thrown at her? <u>or</u> Sometimes or often kicked, bitten, hit with a fist, or hit with something hard? <u>or</u> Ever repeatedly hit over at least a few minutes, or threatened?	No	206	88.8%
	Yes	26	11.2%
Did you live with anyone who was a problem drinker or alcoholic or who used street drugs	No	223	96.1%
	Yes	9	3.9%
Was a household member depressed or mentally ill or did a household member attempt suicide?	No	206	88.8%
	Yes	26	11.2%
Did a household member go to prison?	No	221	95.3%
	Yes	11	4.7%

ACE scores yielded a significantly positive association with cognitive stability, perseverance and motor impulsivity on the Barrat's impulsivity scale. Whereas, it yielded negative association with structure and harmony subscales of the functional identity as well as cognitive complexity subscale of the impulsivity scale. Detailed statistics are presented in Table 3. Moreover, no significant correlation was found with gender ($P= 0.07$), number of siblings ($P= 0.95$) and order in birth ($P=0.08$) and household income ($P= 0.21$). Age of participants was positively associated with ACE scores ($r= 0.15$, $P= 0.02$).

Table 3. Association of ACE scores with subscales of impulsivity and functional identity (n=223).

Variable	r*	P-value
Impulsivity		
Attention	0.038	0.575
Cognitive stability	0.133	0.046
Perseverance	0.145	0.029
Self-control	0.008	0.901
Cog complx	-0.227	0.001
Attention	0.101	0.130
Motor	0.151	0.024
Non-planning	-0.115	0.085
Functional identity		
Structure	-0.219	0.001
Harmony	-0.169	0.011
Goals	-0.012	0.855
Future	0.005	0.941
Personal control	-0.060	0.374

*Controlled for gender, age, year of study, number of siblings and order in birth

Dataset 1. Impulsivity and adverse childhood events

<http://dx.doi.org/10.5256/f1000research.13007.d182670>

The dataset contains all variables pertaining to demographics, responses to Functional Identity Scale and Barrat's Impulsiveness Scale.

Conclusion

In our study, adverse childhood experiences were significantly negatively associated with structure and harmony subscales of the functional identity scale. Providing structure is a major function of one's identity, deprivation of this results in poor self-esteem and negative self-image¹¹. These adverse experiences may provide a better orientation in adulthood to fulfill one's potential in academics and career in adulthood¹¹.

Individuals reporting higher episodes of ACEs reported higher impulsivity, translating to a greater motor impulsiveness and a disrupted executive functioning among these individuals¹².

The results of this study should be generalized with caution. The cross-sectional nature of this study does not establish causality and temporality, therefore, future studies should employ a longitudinal study design.

Data availability

Dataset 1: Impulsivity and adverse childhood events. The dataset contains all variables pertaining to demographics, responses to Functional Identity Scale and Barrat's Impulsiveness Scale. DOI, [10.5256/f1000research.13007.d182670](https://doi.org/10.5256/f1000research.13007.d182670)¹³.

Consent

Participation in this study was voluntary and written informed consent was obtained from all participants. The participants were ensured anonymity and that only group findings would be reported.

Competing interests

No competing interests were disclosed.

Grant information

The author(s) declared that no grants were involved in supporting this work.

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[Reference Source](#)
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[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
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[Reference Source](#)
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[PubMed Abstract](#) | [Publisher Full Text](#)

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[Publisher Full Text](#)
13. Haaris Sheikh M, Naveed S, Waqas A, *et al.*: **Dataset 1 in: Association of adverse childhood experiences with functional identity and impulsivity among adults: a cross-sectional study.** *F1000Research.* 2017.
[Data Source](#)

Open Peer Review

Current Referee Status:



Version 2

Referee Report 29 August 2018

doi:10.5256/f1000research.16311.r35983



Muhammad Shahzeb Khan

Department of Internal Medicine, John H. Stroger, Jr. Hospital of Cook County, Chicago, IL, USA

The article addresses an important issue especially among the Pakistani Population. Considering its a short report, the authors have done a good job in their literature review. However as I am not an expert in this field, cannot comment on the technicalities and intrinsic details of the subject matter. The methods and analysis seem appropriate. In the abstract results section, it will be better to provide numbers, percentages where they talk about frequency of adverse events. In the abstract methods, they should state which analysis they ran.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Referee Expertise: Data Analysis, Data Interpretation, Bibliographic Analysis, Meta-Analysis and Systematic Reviews

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Referee Report 02 July 2018

doi:10.5256/f1000research.16311.r34188



Syeda Fariha Iram Rizvi

Govt, M A O College, Lahore, Pakistan

The article is improved, but still I have one problem - you have used one nominal scale with yes/no and two are ordinal scales. In this case you can't compute Pearson correlation. I think you have to use chi square and logistic regression. I would suggest to consult any statistics expert.

Competing Interests: No competing interests were disclosed.

Referee Expertise: child abuse, child and adolescent psychopathologies and problem behaviors, family relationships

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 29 Jul 2018

Ahmed Waqas, CMH Lahore Medical College, Pakistan

Dear Dr. Rizvi,

My co-authors and I are very grateful to you for your feedback. We had used total scores on the Adverse Childhood Experiences (ACE) scale, Functions of Identity scale (FIS) and Barratt's Impulsiveness Scale (BIS-11). Therefore, these were measured as continuous variables (scale) rather than ordinal or dichotomous. Hence, use of partial correlations is justified in this case.

We would be grateful if you could please reconsider your decision in light of our response.

Best wishes,

Dr. Ahmed Waqas
Corresponding author

Competing Interests: The authors declare that they have no conflict of interest.

Version 1

Referee Report 19 March 2018

doi:10.5256/f1000research.14105.r31204



Syeda Fariha Iram Rizvi

Govt, M A O College, Lahore, Pakistan

Childhood abuse is under recognized phenomena in Pakistan. This research is good effort to link childhood adverse experiences with impulsivity and identity. but there are few confusions/questions. Some detail of ACE questionnaire should be mentioned. Explain sub-variables in ACE in terms of questions. Is every single question of ACE is a separate variable? how we can say that if a person say yes to a single question that means he or she had a adverse childhood experience? Only Frequency and severity of an experience can determine its intensity.

Literature review is poor. Objectives and hypotheses are not mentioned in article.

I have serious concerns regarding result/analysis section. Relationship should be analysed with correlational analysis first and then go for regression analysis to confirm the relation while identifying significant predictors.

Analysis is very much confused as I can't understand that what variables are described as predictors and which one are outcome variables. According to Table no3 impulsivity and identity are describes as predictors/independent variables although according to title and literature ACE are predictors and impulsivity and identity related variables are outcome variables. So according to the purpose of research results are wrong. If author has something else in mind please explain it.

If author will mention objectives and hypotheses and then give analyses according to hypotheses then reader can understand what actually author want to explore.

Discussion is poorly written. please relate your results with existing literature

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

No

If applicable, is the statistical analysis and its interpretation appropriate?

No

Are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Referee Expertise: child abuse, child and adolescent psychopathologies and problem behaviors, family relationships

I have read this submission. I believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

Author Response 12 May 2018

Ahmed Waqas, CMH Lahore Medical College, Pakistan

Response to Reviewer:

Dear Ms. Rizvi,

We are grateful to you for providing such a valuable feedback to our short report exploring the association of adverse childhood experiences with functional identity and impulsivity among adults. We have updated our manuscript in line with your comments, and firmly believe that it has improved the quality of our manuscript.

We hope for your favorable response in due time.

Best wishes,

Dr. Ahmed Waqas

Corresponding author

Comment 1:

Explain sub-variables in ACE in terms of questions. Is every single question of ACE is a separate variable?

Response 1:

We are grateful to you for your feedback. We have expanded the methodology section with details on ACE questionnaire. It now reads as:

“The Adverse Childhood Experiences (ACE) questionnaire is an important assessment tool that measures multiple types of abuse and adverse experiences that one may have encountered as a child¹. It assesses adverse childhood experiences related to abuse (physical, psychological and sexual); neglect (emotional and physical) and household dysfunction (alcoholism or drug use at home, loss of biological parent, mental illness in home, violent treatment by mother and imprisoned household member). Responses to the ACE are recorded on a dichotomous scale (yes/no) and then scores are summed with higher scores corresponding to a higher number of ACEs. It has exhibited adequate reliability (Cronbach’s alpha 0.6 to 0.8) and validity in previous study¹.”

Comment 2:

how we can say that if a person say yes to a single question that means he or she had a adverse childhood experience? Only Frequency and severity of an experience can determine its intensity.

Response 2:

The Adverse Childhood Experiences scale is one of the most widely used scales globally. It has demonstrated adequate factor validity as well as reliability in previous studies. Based on these merits, we had opted to use this scale in our setting. Furthermore, it also yielded an acceptable reliability (alpha= 0.71) in our study.

Please, also see:

1. Felliti V, Anda R: The Adverse Childhood Experiences (ACE) study. Atlanta, GA Center of Disease Control and Prevention.1997. [Reference Source](#)
2. Ford DC, Merrick MT, Parks SE, Breiding MJ, Gilbert LK, Edwards VJ, Dhingra SS, Barile JP, Thompson WW. Examination of the factorial structure of adverse childhood experiences and recommendations for three subscale scores. Psychology of violence. 2014 Oct;4(4):432.

Comment 3:

Literature review is poor. Objectives and hypotheses are not mentioned in article.

Response 3:

We partly agree with your comment. But please, do understand that our manuscript is a short report, bound by a word limit of 1000 words excluding tables and references. Due to constraints of word count, we had provided a summary of the recent literature. And therefore, could not expand the introduction section, which has a word count exceeding 1200 at present.

We have updated our introduction with objectives of the study.

It reads as:

“To address the gaps in scientific literature, the present study explores the association of adverse childhood experiences with demographics, subsequent impulsivity and functional identity among Pakistani adults.”

Comment 4:

I have serious concerns regarding result/analysis section. Relationship should be analysed with correlational analysis first and then go for regression analysis to confirm the relation while identifying significant predictors. Analysis is very much confused as I can't understand that what variables are described as predictors and which one are outcome variables. According to Table no3 impulsivity and identity are describes as predictors/independent variables although according to title and literature ACE are predictors and impulsivity and identity related variables are outcome variables. So according to the purpose of research results are wrong. If author has something else in mind please explain it.

If author will mention objectives and hypotheses and then give analyses according to hypotheses then reader can understand what actually author want to explore.

Response 4:

Dear Ms. Rizvi, thank you so much for your guidance. We have updated our results with new analyses providing mean scores of ACE scale (representing severity of adverse experiences) and frequency of individual types of ACEs. We have also replaced regression analysis with partial correlations adjusted for gender, age, year of study, number of siblings and order in birth.

The results section now reads:

Mean score (SD) on the ACE scale was 1.37 (1.75). A significant proportion of respondents cited verbal abuse (34.5%), physical (22.0%), sexual (15.5%), poor family support (19.0%), neglect (9.9%), separation/divorce of parents (4.7%), and witnessed domestic abuse (11.2%), substance abuse (3.9%), mentally or suicidal patient in the family (11.2%) and criminal background (4.7%). ACE scores yielded a significantly positive association with cognitive stability, perseverance and motor impulsivity on the Barrat's impulsivity scale. Whereas, it yielded negative association with structure and harmony subscales of the functional identity as well as cognitive complexity subscale of the impulsivity scale. Moreover, no significant correlation was found with gender ($P= 0.07$), number of siblings ($P= 0.95$) and order in birth ($P=0.08$) and household income ($P= 0.21$). Age of participants was positively associated with ACE scores ($r= 0.15$, $P= 0.02$).

Comment 5:

Discussion is poorly written. please relate your results with existing literature

Response 5:

We agree with your comment. But please, do understand that our manuscript is a short report, bound by a word limit of 1000 words excluding tables and references. Therefore, we have replaced

our discussion section with conclusion and limitations.

Competing Interests: We do not have any competing or financial conflicts of interest.

Referee Report 12 December 2017

doi:10.5256/f1000research.14105.r28427



Usman Ali 

Fauji Foundation Hospital, Rawalpindi, Pakistan

In Pakistan, the researchers often have to deal with scarcity of existent data on virtually any subject. This article gives insight about adverse childhood experiences and its impact in terms of functional identity and impulsivity. However, there are a few points to be addressed.

First, the title states, Association of adverse childhood experiences with functional identity and impulsivity among adults; a cross sectional study. However, the study population consists of medical students from early adulthood. This should be reflected in the title.

Secondly, the religious and culturally constrained environment is different from other low and middle income countries. Hence, whenever a study in social sciences is conducted prior validity of used questionnaire should be established, which was not done in this study.

Furthermore, in the conclusion the authors have stated a 'high' proportion of subjects who suffered from adverse childhood experiences. What were the control cut off values for high vs low proportion in this regard.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

I cannot comment. A qualified statistician is required.

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

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