Nature-Nurture Journal of Psychology (2022)
(NNJP 2: 1; 2022) DOI: 10.53107/nnjp.v2i1.16.g22

RESEARCH ARTICLE Open Access

Immediate Calamity Based Distress: Psychometric Development and Validation of Fear of Affliction Scale

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Abstract

Background: The purpose of the current study was to develop an instrument that could measure the level of fear of affliction among people from pandemic or any other catastrophe.

Methods: The study was formulated in to two phases, where the first phase contributed in item pool generation through theoretical knowledge and using in-depth interview method. This included participants who had been diagnosed with COVID-19 and were hospitalized for treatment. Subsequently subject matter experts assisted in forming contend validity. Once the items were generated and were reduced study was performed on a sample of 500 university students (M= 23.38, S.D=3.24). A Maximum Likelihood Factor Analysis was performed for the constructing of factorial structure of the instrument.

Results: This study was successful in developing an instrument for measuring the fear of affliction during any catastrophic situation. This instrument exhibit decent alpha coefficient reliability r=0.84 on a 5-point likert scale. Additionally, the instrument yielded a single factor structured instrument.

Conclusions: The instrument can be a useful tool in measuring the severity of fear of affliction during any calamity-based situation. Moreover, the instrument was aimed to be used with any population and in any culture.

Keywords: Fear, affliction, calamity, exploratory factor analysis, covid-19.

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Background

Fear is a fundamental sudden emotion stimulated by the threat of expectancy of what is about to happen, leading to an instant agitated reaction that assembles the organism by activating a set of physiological changes (Adolphs, 2013; Raber et al., 2019). In situations where fear is not correctly adjusted to actual threat, it can be maladaptive and cause psychophysiological issues. This may cause detrimental effects; both at the discrete level and on the societal level (Deacon & Maack, 2008). One such cause of fear is during any calamity whether in form of a pandemic or a natural disaster. A recent example of this was during the starting phases of COVID-19, where everyone was terrified in one way or another for the safety of their own lives and the lives of their loved ones (Abbas et al., 2020; Shoib et al., 2020; Shuja et al., 2020). And even to this very day this fear persists with each mutation of the virus (Wang et al., 2020). The most generalized prospect of this fear stems from getting afflicted by the virus. Where affliction is explicated as a condition which causes great suffering and distress; physiological or psychological, accompanied by deep sorrow related to expectancy of loss of oneself or someone significantly important (Sharma et al., 2020; Shuja et al., 2020; Sim, 2020). It is crucial for health care workers and mental health professionals to have an assessment tool which can accurately measure the extent of fear of affliction from any such calamity to better interpret the phenomenon (Ahorsu et al., 2020; Arpaci et al., 2020; Tzur Bitan et al., 2020).

Though several such instruments exists substantially are limited in their scope for measuring fear of affliction during any calamity situation. Like Pain Anxiety Symptom Scale (PASS) (McCracken et al., 1992) which measures for fear and anxiety caused by pain. Similarly, Fear Avoidance Beliefs Questionnaire (FABQ) (Williamson, 2006) which is more associated with measuring psychological fear related beliefs about physical work and activity. Another such instrument, Penn State Worry Questionnaire (PSWQ) (Meyer et al., 1990) measures one component of fear that is worrying but is more linked to generalized anxiety. The closest instrument so far to assess the fear of affliction in a catastrophe centered situation could be Fear of COVID-19 scale (Aqeel et al., 2022;Ahorsu et al., 2020). Nevertheless, this instrument's limitation lies in its focus only on COVID-19 itself. Therefore, the current study endeavors in developing a psychometrically valid instrument which can measure fear of affliction.

For this particular purpose it is imperative to understand fear itself in a calamity centered state. In a recent study by Schimmenti et al (2020) when studying the varied types of fear which individuals experienced during the COVID-19 pandemic; they identified 4 major domains including (1) fear for physical body, (2) fear for familiar others, (3) fear of the unknown and (4) fear of taking initiative (Schimmenti et al., 2020). All representing biological, social, mental and behavioral characteristics of fear. This fear can be observed from various actions initiated against the pandemic like safety behaviors (e.g., washing hands, wearing masks, avoiding social interactions, etc.) that can give rise to certain threats (e.g. contamination), but they may also automatically enhance fear (Bottemanne & Friston, 2021; Knowles & Olatunji, 2021). Correspondingly, societal safety measures (e.g., lockdowns, quarantine, etc.) encompass their use to prevent spreading of the virus (Rukh et al., 2020; Shoib et al., 2021; Shuja et al., 2020). Which in contrast because of its strictness, equally had negative impacts (e.g., disturbance of economy, unemployment, isolation, suicide, etc.) (Shuja et al., 2020).

By considering the theoretical concept of aforementioned fear and its domains in light of the current pandemic, several observations can be drawn to highlight underlying indicators for construction of an instrument which incorporates the possible characteristics of fear of affliction in a calamity-based scenario. Predisposition of uncertainty, which can be defined as an individual dispositional inability to endure the inappropriate response generated by the deceptive nonappearance of noticeable information and continued by the associated perception of uncertainty, could represent one such psychological factor (Anderson et al., 2019; Carleton, 2016; Shihata et al., 2016).

Another psychological susceptibility factor could be worrying. Worrying states to a psychological procedure of harboring repetitive negative and disastrous thoughts and has been linked with depression and a number of anxiety-related disorders (Davey & Wells, 2008; Meyer et al., 1990). Likewise, experience to information about the imminent danger could additionally be a possible indicator of fear (Buckley, 2016; Carleton, 2016). There is evidence that repetitively engaging with trauma linked media content for several hours daily shortly after cooperative trauma may extend severe stress experiences (Holman et al., 2014; Li & Zhong, 2022). As increased media exposure was found to be associated with amplified fear (Van Den Bulck & Custers, 2009; Young et al., 2008). Lastly, proximity of fear is noted to significantly increase when danger is connected either to oneself or to precious ones (Pedrosa et al., 2020; Steimer, 2002; Stussi et al., 2015).

Method

Objective

The purpose of the current study was to develop an instrument that could measure the level of fear of affliction among people from pandemic or any other catastrophe.

Research design

This study was approved by Research Ethics Committee of the Department of Psychology, National University of Modern Languages, Islamabad (NUML), Pakistan. A purposive sampling technique and cross-sectional research design was used to perform this present study.

Scale validation and development

In scale development, theoretical basis of Schimmenti et al. (2020) fear model was used which elaborated fear in to four dimensions as discussed above. For supplementary perspective of fear in relation to the coronavirus an online qualitative survey was conducted and included questions like "What specific thing, in relation to pandemic, are you most afraid of?" and "When thinking about getting afflicted what things comes into your mind?" Etc. The sample consisted of a group of individuals who have been infected by corona virus themselves or have witnessed its effect on someone they knew. Based on this very distinction, two separate groups were established as sample

for qualitative survey. Participation was voluntary and 10 participants were taken randomly for each specific group. Subsequently, a qualitative thematic analysis was conducted to establish themes. These themes along with the theoretical framework-based items were utilized for developing an item pool.

Phase 1: Item Selection Pool

A total of 47 items were produced from the themes and theoretical concept of fear. All the items were written in English language while conforming to the methods and rules for questionnaire development. A total of five Subject Matter Experts (SME's) were contacted, for the purpose of establishing construct validity, based on expertise and work on scale development. All 47 items were examined autonomously by SME's and items with similar meanings, or those that were unclear or confusing were removed. In total the SME's reduced the total number of items to 15 which were used for initial version of Fear of Affliction Scale (FOAS). The responses were taken on a 5-point Likert scale where 1 was labelled as "Not at all and 5 was labelled as "Always". Additionally, the sequencing of items in the scale were done randomly. Moreover, a demographic data form was also added at the start of questionnaire for research purpose.

Phase 2: Data Collection

Sample/Participants. For preliminary pilot testing the scale was administered to a sample of N= 20 students (male=10, female=10) from different universities mean age 21.38 (range = 18-33). The survey was administered using "Google Form" service and the partakers were given same set of instructions. The participants were sent the link to online survey using mobile application like "WhatsApp"; "Facebook" and "Emails". Furthermore, to ensure ethical standards, confidentiality and anonymity was upheld throughout the data collection process.

Since the pilot testing suggested significant findings, data was collected from a larger sample for conducting main study and establishing various validities. Similar, to pilot testing this sample was also approached using online survey method. The link to online Google Form was sent to a total of approximately 800 students, from different universities, using mobile applications (WhatsApp; Facebook and Emails). To achieve this number a snowball techniques was used to forward the link. By the end of data collection phase, a total of N = 500 forms were filled by students. Through demographic data it was discerned that the mean age of the sample was 23.38 and standard deviation of 3.24 (range =18-40).

Inclusion Criteria. No specific inclusion criteria were set other than that the sample should only be of university students. This was done as students' population was one of the major population's which was affected badly by coronavirus (Aqeel et al., 2020; Hamza Shuja et al., 2021).

Exclusion Criteria. Conforming to the inclusion criteria, no exclusion criteria were made for the present study other than no other sample except student was included.

Procedure for collection of data. The developed Google Form was set with restriction that the participant had to answer all the questions. This may have reduced the final data set significantly but had ensured that all the collected forms were complete.

Demographic	N	%
Age in year's		
18-19	120	24
20-25	150	30
26-30	195	39
More than 30	35	7
Gender		
Male	275	55
Female	225	45
Education		
Graduate	187	37.4
Undergraduate	313	62.6
Family System		
Nuclear	374	74.8
Joint	126	25.2

Phase 3: Data Screening

Missing data treatment. Using Statically Package for Social Studies (SPSS), a Maximum Likelihood analysis was done for missing data. This technique is particularly useful in assessing standard errors and parameters by utilizing observed part of data with omitted data (Field, 2017; Misago et al., 2015; Shuja et al., 2020).

Outliers Treatment. A square root transformation (SRT) was conducted for detecting any outliers. This analysis uses ranges between 0 and 1 for normalizing it and identifying outliers at both sides (Cousineau & Chartier, 2010).

Phase 4: Item Screening

Descriptive analysis. For further refinement of the data distribution mean, and standard deviation were assessed to check if all items falls under normal ranges.

Phase 5: Reliability and Validity Analysis

Construct Validity. To establish the factor structure of the developed FOAS scale, a Maximum Likelihood Analysis (MLA) analysis was performed for assessing the factor structure of the developed instrument (Bhatti et al., 2021; Briggs & MacCallum, 2003; Munawar et al., 2021). Squared multiple correlations were utilized to estimate communalities (Gorsuch, 2009; Naz et al., 2021) Whereas, Kaiser-Meyers-Olkin (KMO) value was employed for sampling sufficiency, and the Bartlett method was used to distinguish unbiased factors, which correlate only with their own factor (Vieira, 2011).

A direct oblimin method of rotation was used since it was assumed that all the items were correlated which was observed from the component correlation matrix. Originally the total number of factors determined by the Scree-test were 3. However, based on the factor loadings of each component only those factors were retained whose values were higher (>0.5) for and a satisfactory inter-factor correlation (~ 25). This led to formation of a unidimensional instrument as can be seen in Table 4. There were no reverse items in the present scale, whereas, one item was dropped due to double loading.

Content validity. An additional group of 5 expert psychologists' panel was briefed about the purpose and aim of the development of the instrument and were asked to label the two achieved factors. A benchmark arrangement of 70% cut-off interrater was decided.

Table 2. *Descriptive analysis of the items (N=500)*

Item	Mean	S.D
I feel a constant presence of mental uncomfortability due to uncontrollable situation.	2.15	.98
I am constantly afraid of losing my life.	2.0	1.23
I am worried with thoughts of my loved ones dying.	2.09	1.26
I experience shortness of breath or hyperventilated from time to time due to the current scenario.	1.61	.93
I find it difficult to be still and calm due to the hazardous situation.	2.05	1.17
I find it extremely difficult to relax by thinking about what will happen.	2.13	1.18
Due to the alarming situation I find it very hard to concentrate on any of my work.	2.15	1.11
Since the beginning of this catastrophe I cannot control or stop feeling worried for future.	2.35	1.23
I started having sleep problems such as difficulty in falling or staying asleep accompanied by feeling of restlessness.	2.18	1.23
My body constantly feels stiff and tensed all the time.	1.98	1.19
I have started experiencing chest pain or heart palpitations since the calamity started.	1.65	1.07
I am afraid of losing my family and loved ones in this difficult time.	3.2	1.53
Every time I watch news or hear stories about the current situation I become more anxious and nervous.	2.62	1.40
I have this feeling of dread every time I pass by a hospital or clinic since this calamity struck.	2.09	1.33

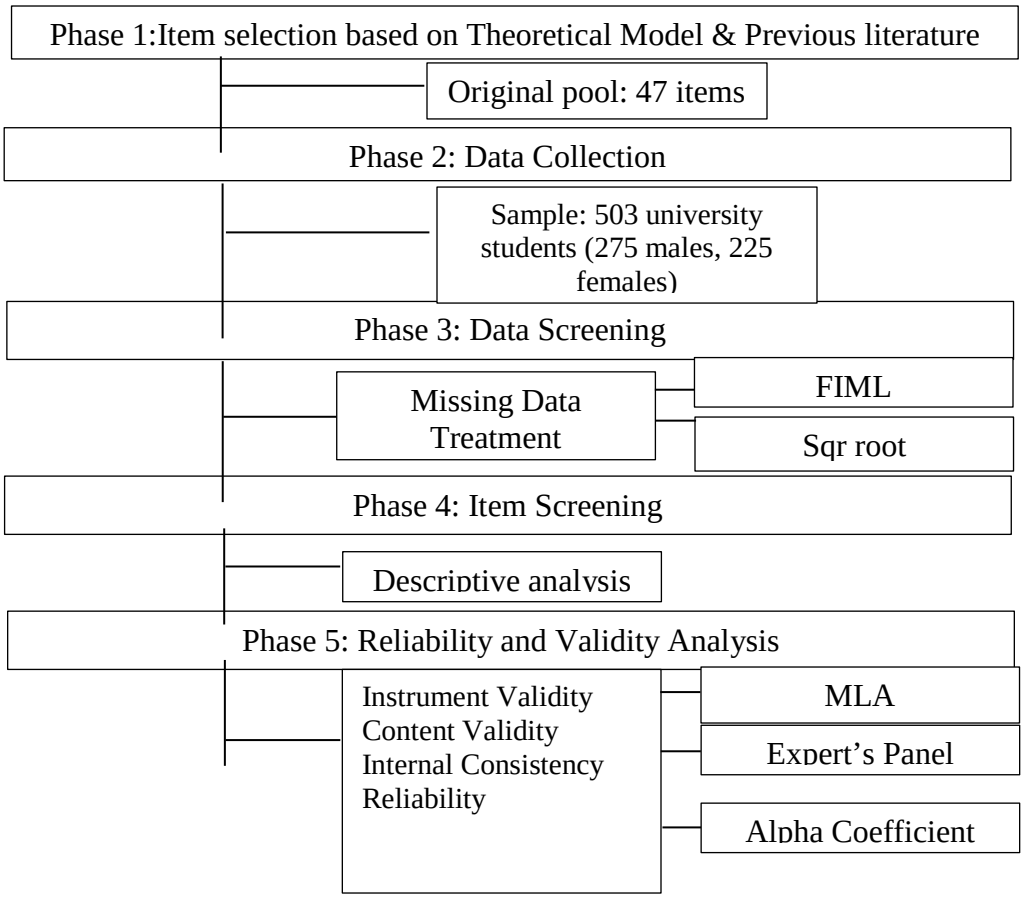

Fig 1. FOAS derivation flowchart, MLA = Maximum Likelihood Analysis

Results

Table 3

Alpha Coefficient Reliability Analysis

Cronbach's Alpha	No of items
.842	14

Table 4

KMO and Bartlett's Test (N=500)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.826
Bartlett's Test of Sphericity	Approx. Chi-Square	1592.281
	Df	105
	Sig.	.000

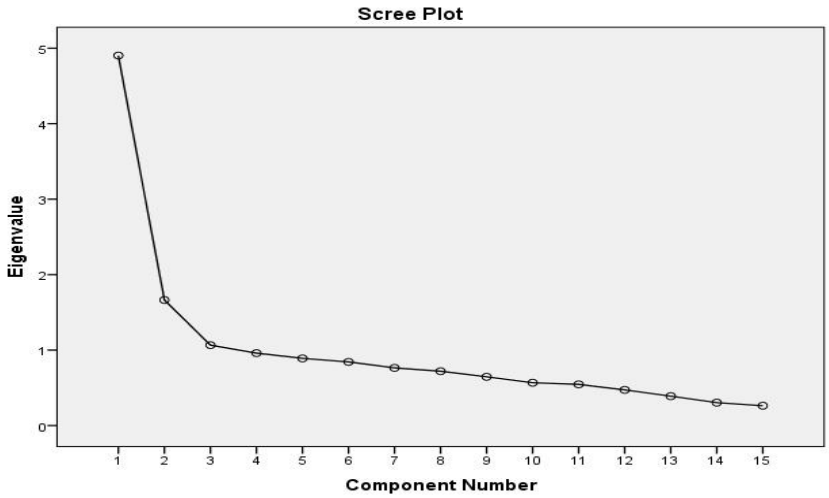

Fig. 2. Scree Plot for the Eigen value of the factor structure for FOAS (N = 500)

Table 5

Exploratory Factor Analysis of the Fear of Affliction Scale (N=500)

Items	M (S.D)	S	K	Statements	Three Factor		
4	2.16 (.98)	.09	-.68	I feel a constant presence of mental uncomfortability due to uncontrollable situation.	.510		-.391
11	2.01 (1.24)	-.06	-.77	I am constantly afraid of losing my life.	.653	.390	
13	2.090 (1.27)	.08	-.76	I am worried with thoughts of my loved ones dying.	.494	.478	-.394
12	1.62 (.94)	.51	-.54	I experience shortness of breath or hyperventilated from time to time due to the current scenario.	.634		
10	2.06 (1.17)	.37	-.36	I find it difficult to be still and calm due to the hazardous situation.	.563		
8	2.14 (1.18)	.08	-.78	I find it extremely difficult to relax by thinking about what will happen.	.646		
7	2.16 (1.12)	-.05	-.95	Due to the alarming situation I find it very hard to concentrate on any of my work.	.692		
14	2.36 (1.24)	.44	-.49	Since the beginning of this catastrophe I cannot control or stop feeling worried for future.	.692		
9	2.18 (1.24)	.38	-.49	I started having sleep problems such as difficulty in falling or staying asleep accompanied by feeling of restlessness.	.576	-.460	
6	1.99 (1.195)	-.33	-.45	My body constantly feels stiff and tensed all the time.	.624	-.354	
1	2.88 (1.08)	-.05	-.75	I have started experiencing chest pain or heart palpitations since the calamity started.	.598		
2	1.65 (1.07)	-.17	-.84	I am afraid of losing my family and loved ones in this difficult time.	.463		-.318
3	3.22 (1.53)	.17	-.88	Every time I watch news or hear stories about the current situation I become more anxious and nervous.	.508	.501	
5	2.63 (1.41)	.14	-.68	I have this feeling of dread every time I pass by a hospital or clinic since this calamity struck.	.503	.414	
Eigenvalues					8.3	1.3	1.1
% of variance					55.1	8.8	3.4
Cumulative Variance					55.1	63.9	59.2

The first factor suggested the disagreement on part of the peer in relation to each act of the victim, blaming them for everything and so it was labelled as "peer-disagreement". The second factor reflected losing trust in one's own ability to make decisions, judgement, realities etc., and for this reason was named "loss of self-trust".

Internal consistency reliability. For measuring internal consistency reliability, an alpha coefficient analysis for each of the subscale (factor) was examined separately (Field, 2017).

Results

Exploratory Factor Analysis (EFA)

The results for the current study include descriptive relating to the demographical data collected along with the mean value of the data. The other analyses include alpha reliability KMO and component factor analysis as follows.

The Table 3 indicates the Cronbach alpha reliability of the developed FOAS scale. The developed instrument had a reliability of r=.842; which suggests an adequate reliability and its mean that item has internal consistency.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy. This measure varies between 0 and 1 and values closer to one are better. Table 4 depicts the value of KMO which was .826; while the Bartlett's Test was also significant.

Component Matrix

This table comprises of component loadings which are the associations or correlations between the variable and the component. As we can see by the table three components were taken out or extracted. Three components that had an eigenvalue more than 1. As we can see in Table 5 the component 1 contains all positive value or scoring and component 2 and 3 contain the negative value or scoring. Because component 2 and 3 contain the negative scoring or values which means that these items are not fit in or not suitable for that factor and these are meaningless. So, we are loading all the factors in component 1 and our scale is unidimensional.

Scree plot extracted three components as shown in the *Fig. 2*. The scree plot displays the eigenvalue in contradiction to the component numbers obtained. To resolve this issue only those principle components were retained whose eigenvalues were greater than 1.

Discussion

The purpose of the current research was development of a scale to measure fear of affliction especially in situations where there is an impending sense of calamity or an actual catastrophe is taking place. Researchers have explained fear as a basic abrupt emotion aroused by the threat of the unknown, leading to an immediate distressed reaction by triggering a set of bodily changes (Adolphs, 2013; Raber et al., 2019). The currently developed scale was constructed using theoretical basis of Schimmenti et al. (2020), as this model was formulated during Covid-19 catastrophe. Additionally, in-depth interviews from those who experienced or suffered from the pandemic was also incorporated in constructing the instrument. The constructed instrument is aimed to be used with different cultures to assess the prevalence of fear of affliction during any sort of calamity, either natural or man-made. The final version of scale was comprised of a total of 14 self-reporting items. Each item was devised using a five-point Likert scale system, extending from 1 (never) to 5 (all of the time).

The construction of the newly developed instrument suggested a single factor instrument based on the eigen value, which was later confirmed from the findings of maximum likelihood model. Though there were few items with double loadings, the items were retained based on higher loading (Shuja, Aqeel, & Sarfaraz, 2020). The analysis was done using a sample of 500 university students during pandemic. The sample was selected based on the fact that student population was one of the population which suffered most during the pandemic (Aqeel et al., 2020; Toqeer et al., 2021). As all their education institutes were closed which were then was changed to online system. Moreover, there were thoughts and worries of impending affliction from the virus, for themselves and their families (Bhatti et al., 2021; Carleton, 2016; Davey & Wells, 2008; Stussi et al., 2015).

Though there were other instruments which do measure fear one major limitation which they suffered from was their specificity see PASS; (McCracken et al., 1992); Fear Avoidance Beliefs Questionnaire (Williamson, 2006); Penn State Worry Questionnaire (Meyer et al., 1990) as they measured fear under a specific condition or fear from a specific element. Whereas, the current instrument was unique in the sense that it measures fear of people from every form of catastrophe. This can be useful for healthcare workers, social workers and mental health professionals in any fear-provoking calamity which can then be used with other instruments for analyzing various psychological issues.

Limitations and Future Recommendations

Similar to every other study there were some limitations during the development of the current instrument which should be examined and taken care of in future studies.

1. The sample for the current study consisted of student population which in one way or another did suffer greatly during pandemic. However, the more ideal sample would have been that of individuals who have suffered either by contracting the virus or due to loosing someone close during the pandemic. Future studies should try implementing the developed instrument on such sample could yield interesting findings.
2. Another limitation was that the instrument did not established any other validity due to the limited time frame and objectives of the study which was more focused on scale construction. Future studies should analyze the instrument with other established instrument for the construction of various validities such as convergent and divergent validity.

Conclusion

Conclusively the developed instrument was developed with the intention of measuring the severity of fear of affliction during any disaster. This was necessary as during the current outbreak it was observable that fear claimed the life of many individuals by making them commit suicide. The findings of the current study suggested a single factor structured instrument for measuring fear based on five-point likert scale system. Hopefully, the instrument can be used in future studies with populations or samples who have experienced or suffered from any sort of disaster, so proper

timely interventions can be implemented.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical Consideration

The study was approved by the department of Psychology, National University of Modern Languages, Islamabad (NUML), and Pakistan. Consent Form was taken before taking data and participants were asked to take voluntary participation

Acknowledgement

The author thanks to department of Psychology, National University of Modern Languages, Islamabad (NUML), and Pakistan.

Availability of data and materials

The data sets used and analyzed during the current study are available from the corresponding author on reasonable request.

Authors' contributions/Author details

Kanwar Hamza Shuja performed the main study under the supervision of Muhammad Aqeel. Sehrish Gulfaraz, and Kinza Fida wrote the article under the guidelines of Nature-Nurture Journal of Psychology.

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Ethics declarations

Ethics approval and consent to participate

This study was approved by the Institutional Review Board (Department Of Psychology, National University of Modern Languages, and Islamabad). A written informed consent was obtained from all participants.

Consent for publication

Not applicable.

Competing interests

The authors declare to have no competing interests.

Additional Information

Not applicable.

Received: 20 December 2020 Accepted: 26 February 2022: 31 February 2022 published online

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