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Validation of Scale of Anxiety Symptoms in Clinical Sample of Adolescents

Rabia Bootay Khan[1], Humaira Naz[2]

[1]Consultant Clinical Psychologist, Centre for Clinical Psychology, University of the Punjab, Lahore, Pakistan
[2]Assistant Professor, Centre for Clinical Psychology, University of the Punjab, Lahore, Pakistan.
Correspondence: rbkrana24@gmail.com[1]

ABSTRACT

Aim of the Study: The goal of present research was validation of a newly developed indigenous scale of anxiety symptoms in clinical sample of adolescents by Khan et al., (2022). The scale already gone through procedure of items generation, exploratory factor analysis (EFA) and inter-rater reliability.

Methodology: Confirmatory factor analysis (CFA) as well as investigation of psychometric properties was done on clinical sample in present study making it a promising indigenous scale to assess anxiety symptoms in the adolescents. CFA was done on sample of 220 (M=14.25, S.D. =1.86) on Analysis of Moment Structure (AMOS) version 23.

Findings: Final model consist on the 26 items and 2 factors. Covariances were added across various items within same factor which help the results to improve. Model gave significant model fit indices values (TLI=0.8, RMSEA=0.09, CFI=0.83). The overall scale and subscales showed high Cronbach Alpha reliability with value 0.91. Psychometric properties include convergent, discriminant validity as well as test-retest reliability were also investigated giving values of 0.92, 0.69 and -0.34 respectively.

Conclusion: This scale can be effectively used across clinical setting to assess anxiety symptoms in adolescents as well as for research purposes.

Keywords: Anxiety Symptoms, Indigenous Scale, Validation Study, Clinical Sample.

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1. INTRODUCTION

Anxiety is considered as the typical and complex state of emotion. Every individual in certain areas of life experience anxiety. It is an emotion which is characterized as thoughts of worry, precariousness and fear that arise from prediction of threatening event that can be realistic or imagined which often result as the impairment of psychological and physical functioning (Khan et al., 2007). It is often accompanied by various physiological symptoms such as fast heartbeat, trembling, sweating, shivering, difficulty in concentrating on tasks, increased blood pressure and feelings like tension (American Psychological Association, 2022).

These symptoms are typically experienced by individuals in adolescence which is transitional phase in life between late childhood and early adulthood ranges from 12 years to 19 years (Tripicchio, et al., 2019). This stage is primarily a unique stage of human development where most of the physical and behavioral changes occur (Adolescent Health, 2022). During adolescence phase, the etiological factors for the anxiety disorders include biological, interpersonal, and cognitive risk factors (Grant, 2013). On the basis of its manifestation and symptomatology, DSM-5 TR classified anxiety disorders into different types. It include Selective mutism, Specific phobia, Social anxiety disorder (social phobia), Separation anxiety disorder, panic disorder, agoraphobia, anxiety disorder due to substance use or medication treatment and anxiety disorder because of other medical condition.

1.1 Generalized Anxiety Disorder

From all these anxiety related disorders, generalized anxiety disorder is considered as prevalent anxiety disorder in adolescents. It is a mental illness that is highly disabling and most prevalent (Maron & Nutt, 2017). According to DSM-5 TR, generalized anxiety is a form of excessive worry or anxiety with apprehensive thoughts which occur frequently for at least 6 months cause disruption in various activities or events like performance at workplace and in school and the person finds difficulty in controlling that worry (APA, 2022).

1.2 Social Anxiety Disorder

Social Anxiety is considered as one of the prominent types of anxiety disorders in which there is extreme fear which the person is facing in social situation or setting because the person is afraid from evaluation by others as one might be humiliated, embarrassed or judged by others. Individual has intense fear that he or she might act in a manner that will not be appreciated by other people. They try to escape from that social situation conversely endorsed the situation with tension. In Social Anxiety Disorder, adolescents exhibit the most typical signs and symptoms such as involuntary shaking, shivering, reddening of the face due to embarrassment and shame and sweating all over (APA, 2022).

1.3 Specific Phobia

Specific phobia is another major type that came under the umbrella of anxiety disorders. In this disorder, individual exhibit extreme fear for specific object or situation. DSM-5 TR categories the specific phobia into five major types. First one is specific phobia related to particular situation. In situational type, the fear is triggered by some specific situations including flying (airplanes), closed spaces (elevator). Second type is related to natural environment in which fear is triggered due to an object in the environment like water, height, darkness, storms etc. Third type is called animal type in which fear is triggered by insects or animals. Fourth one is related to blood injection or injury. In this type, the fear in individuals is developed by noticing the blood, injection or injury. The last type of specific phobia is other type in which fear is triggered by some circumstances that lead the individual to vomiting or choking. When the individual encounter the phobic situation or object, it instantly produce anxiety symptoms in the individual (APA, 2013).

1.4 Prevalence

Anxiety related disorders are common psychological disorder in adolescents. Worldwide with meta-analysis from 41 studies including 27 countries and 63,130 young people suggest the rate of prevalence of anxiety is about 6.5% over the year in 2015 (Polanczyk et al., 2015). According to a study conducted in Pakistan by Mirza & Jenkins in 2004, the overall average rate of prevalence of anxiety and depression in community sample is 33.62%, with prevalence rate in female 45.5% and 21.7% in male. Developing world is facing various anxiety disorders. In Pakistan, the actual prevalence of anxiety related disorders is still unknown. Its need of the time to create evidence base to help in the development of policy on intercepting anxiety and related disorders in Pakistan (Khan et al., 2007). In gender differences, it has been examined that female exhibit anxiety symptoms more than male, except for social anxiety. Social anxiety show no gender differences in prevalence (McLean et al., 2011).

The main purpose of present research was to validate the newly developed psychological scale of anxiety symptoms for assessment of anxiety in adolescents. The Focus group discussions depicts the themes of generalized anxiety disorder, social anxiety disorder and specific phobia which were taken as keen content basis for the scale construction.

2. LITERATURE REVIEW

A number of researches have been conducted in the recent years. Various researchers construct and did validation of scales and develop psychometric properties of scale on anxiety disorders as well as anxiety symptoms for different age groups. Literature review will serve as a foundational investigation on the historical development of assessment scales, the conceptual foundations of anxiety symptoms in adolescents and the vast perspectives that influence the construction and validation of measurement scales.

Beck Anxiety Inventory (BAI) is considered as a promising scale in domain of assessment for anxiety disorders. BAI contain 21 items and rating of items is 0 to 3 as minimal to high anxiety respectively (Beck et al., 1997). Further psychometric properties were developed through two later researches on already constructed BAI. In first study, test-retest reliability as well as internal consistency of inventory investigated on clinical population (N= 40 outpatients of anxiety disorders). Results showed strong Cronbach's alpha = .94 and reliability in acceptable range over period of eleven days (r = .67). In second study, convergent and discriminant validity of BAI was determined. The Beck Anxiety Inventory indicated high correlation with anxiety as investigated through State Trait Anxiety Inventory and low correlation with depression as investigated through Beck Depression Inventory (Fydrich et al., 1992)

Hamilton Rating Scale is a questionnaire based on clinician rating that contain 14 symptoms and use for both psychological symptoms as well as somatic symptoms. It was administered on 35 outpatients by 3 physicians. Reliability of the scale was high, as shown by t test and correlation between raters. Scores on each item can be calculated on basic number scoring from 0 means not present to 4 means severe. Score of 17 out of 56 is noted as low anxiety. Scores between 20-30 and more indicate moderate to severe anxiety (Hamilton, 1959).

Multidimensional Anxiety Scale for Children (MASC) was administered on 210 adolescents of high school, 115 clinically diagnosed adolescents (86 boys, 29 girls) and 95 non-clinical participants. Statistical analyses conducted on the data support a 3 factor structure model, with a decreased item pool. The model resulted after analysis was invariant across younger and older participants as well as across boys and girls (Houghton et al., 2014). The psychometric properties of the MASC were also determined among children of Nairobi public secondary school, Kenya. The Multidimensional Anxiety Scale for Children had overall high internal consistency with alpha value 0.85 in the sample of Kenya which was similar to the findings of western studies. Hence a reliable measure for assessing anxiety in the adolescent population give reliable results (Ndetei et al., 2008).

Spence Children Anxiety Scale was developed to create a valid measure for anxiety. Items of the scale were taken from primary item pool of eighty which was produced in order to create a broader range of symptoms of anxiety (Spence, 1997; Ahlen et al., 2018). Selection of Items in item pool was done after reviewing the previous literature and evaluation from 4 clinical psychologists, those who have specialty in domain of anxiety spectrum. The scale contained forty-four items, from which thirty-eight items showed particular symptomatology of anxiety disorder & six were related to positive, some filler items to decrease response bias. Children were instructed to mark on 4 point Likert scale (0 = never, 3 = always). The internal consistency of overall measure was extremely high (Spence, 1997; Ahlen et al., 2018).

Another research conducted with the goal to investigate the psychometric properties of Siddiqui Anxiety Scale-Revised (SAS-R) in population of Pakistan (Hasnain & Siddiqui, 1993). First of all, a pilot study was conducted with sample of 15 boys and 15 girls with average age almost 25.07 years. In the main study, validity as well as reliability analysis of SAS-R were conducted with 27 items by using a

convenient sampling as sampling strategy. Cronbach's alpha reliability of Siddiqui Anxiety Scale-Revised was found to be very high with value 0.90. The exploratory factor analysis (EFA) revealed that there were 2 factors in Siddiqui Anxiety Scale-Revised named as cognitive-affective & somatic which account for 34.48% of overall discrepancy. The concurrent as well as discriminant validity of scale was also investigated through analyzing it with Beck Anxiety Inventory, Urdu translation (Raza, 2013) and Life Orientation Scale Revised respectively (Shaheen et al., 2015). Siddiqui Anxiety Scale-Revised had significantly positive correlation with Beck Anxiety Inventory and a significantly negative correlation with Life Orientation Scale-Revised for subscales of pessimism and optimism. Psychometric properties of Siddiqui Anxiety Scale-Revised were found to be adequate to recommend it as a screening measure of anxiety symptoms Pakistani population.

2.1 Rationale of Present Study

Various scales have been developed on anxiety disorder/anxiety symptoms on different age groups (Hamilton, 1959; Beck et al., 1988; Spence, 1997; Muris et al., 2017, March & Parker; 2014). All the scales are related to west assess anxiety symptoms in different age bands i.e. adulthood, adolescent, children etc. However, the manifestation of anxiety symptoms in Pakistani population is different in terms of physiological, behavioral and cognitive aspects. This manifestation varied in adolescents as adolescences is critical phase of human life; a transitional phase where most of the changes occur. These all factors contribute to impact the mental health of adolescents result in various physical and psychological symptoms. There was not any indigenous scale that measure these anxiety symptoms in adolescents.

On the basis of reviewing literature, theoretical frame work and focus group discussions, Khan et al., (2022) developed a scale on anxiety symptoms in adolescents establishing face and content validity, construct and concurrent validity along with internal consistency. However, latent factor structure of the newly developed scale has yet to be verified as it is necessary to investigate psychometric properties of any measure, like convergent and divergent validity and test retest reliability.

3. METHOD

The goal of present research was to confirm the factor structure derived from exploratory factor analysis and to establish psychometric properties of the indigenous scale of anxiety symptoms in adolescents on clinical sample. The study opted both qualitative and quantitative approach for data collection, analysis and validation of results. Non-clinical sample was taken for exploratory factor analysis during phase of scale development. In the present study, clinical sample was taken for confirmatory factor analysis in order to confirm latent factor structure of the newly developed scale. Non-probability purposive sampling was used as sampling strategy for clinical sample. According to Mundfrom et al. (2009) overall 220 participants were recruited for adequate sample size. The data was collected from various public and private sector hospitals as well as psychiatric clinics through questionnaire with the Likert scale ranging from 0 (not at all) to 3 (almost always).

3.1 Scale Development Procedure

The scale of anxiety symptoms in adolescents was constructed in two phases; first was development of scale & second was validation and development of psychometric properties of scale. In first phase, exploratory factor analysis (EFA) was performed on 40 items scale to extract the factors of anxiety. Items reduced to 30 through EFA on the basis of low communality and factor loading i.e. less than 0.4. In the present study, second phase was done in which confirmatory factor analysis (CFA) was performed to confirm the latent factor structure model. The CFA was performed on final two factor solution given by EFA to check either the items loaded within a factor are truly reflecting the theme of that factor. Hu and Bentler (1999) fit measure was used to evaluate the model fit for the construct. Cronbach's α reliability analyses was done to examine internal consistency of overall scale and its subscales. Pearson Product

Moment Correlation was conducted to test the convergent & divergent validity as well as test re test reliability.

Before conducting the Confirmatory Factor Analysis, data screening process was done to identify missing data as well as to determine the suitability of data for CFA.

3.2 Missing Data and Outliers

Total data of 247 was collected during data collection process. The data of 27 participants was discarded because either they did not fulfil inclusion criteria or there were missing values in those cases as Confirmatory Factor Analysis is sensitive to missing values. Furthermore, no univariate or multivariate outliers were find out using z-scores ±3 and Mahalanobis distance respectively. Hence these checks resulted in total 220 entries used for confirmatory factor analysis.

3.3 Test of Normality

After detecting the missing data and outliers, the normality assumption was assessed. Both the values of skewness and kurtosis fell inside the range of ±2. The Cronbach's alpha value of the scale was 0.91 which depicts the high reliability as well as the strong internal consistency among items of the questionnaire. Hence normality assumption was fulfilled for the data (Kim, 2013).

3.4 Model Identification

The model was specified on basis of Exploratory Factor Analysis results. It was made sure that whether the hypothesized model is valid to test. The model identification depicts over-identification (df = 298) and so it was valid for the testing process (Shek & Yu, 2014). For estimation of parameters, the preferred approach maximum likelihood estimate was used which is already set as default for parameters estimation in AMOS and it is recommended approach.

3.5 Assessment of Model Fit

Despite the fact that Chi-square is usually used as statistical summary to evaluate model fit, however it's somewhat susceptible to the size of sample. As the chi square results were significant, $x2$ (298) = 3272.689, p = .000 that's why some other possible model fit indices were used to assess the model fit (Shek & Yu, 2014).

3.6 Confirmatory Factor Analysis

Confirmatory factor analysis was run on sample of adolescents with anxiety symptoms (N=220). The analysis was conducted through AMOS-23.

Table 1: *Model Fit Indices of Original and Final Model*

Model Fit Indices	Original Model	Final Model
CMIN/df	3.95	2.90
GFI	0.73	0.77
AGFI	0.63	0.69
RMSEA	0.12	0.09
NFI	0.66	0.76
CFI	0.72	0.83
IFI	0.72	0.83
TLI	0.69	0.80
RFI	0.62	0.72
PCFI	0.66	0.71

Note. CMIN/DF = Minimum Discrepancy Function by Degrees of Freedom divided, AGFI = Adjusted Goodness of fit index, GFI = Goodness of fit index, NFI = Normalized fit index, CFI = Comparative fit index, IFI= Incremental

Fit Index, RFI = Relative fit index, TLI = Tucker-Lewis index, RMSEA = Root Mean square error of approximation, PCFI = Parsimony Comparative Fit Index.

The results produced after initial CFA (original model) followed the model fit indices CMIN/df = 3.95, CFI = 0.72, PCFI= 0.66, TLI= 0.69, RMSEA = 0.12, NFI= 0.66, IFI= 0.72, RFI= 0.62 and PCLOSE = 0. The results were adequate to some point but the values of CFI and RMSEA were still to be enhanced for better model fit indices which was done through modifications.

As a result, modification indices were also analyzed for error variances that were greater than 10. Parameters showed covariance between the variables (items). The model was then re-specified and variables were allowed to co-vary. Total 20 modifications were done between the items of Factor 1 (Anxiety manifestation) to enhance the values of CFI and RMSEA in order to improve values of model fit indices. The final model showed adequate indices values for model fit index (CMIN/df = 2.90, CFI = 0.83, PCFI= 0.71, TLI= 0.8, RMSEA = 0.09, NFI= 0.76, IFI= 0.83 and RFI= 0.72). Value of CMIN/df less than 3 is considered as adequate fit while CMIN< 5 refers to acceptable fit (Hu & Bentler, 1999; West et al., 2012). The value of CFI> 0.8 and RMSEA < 0.1 were in marginal range.

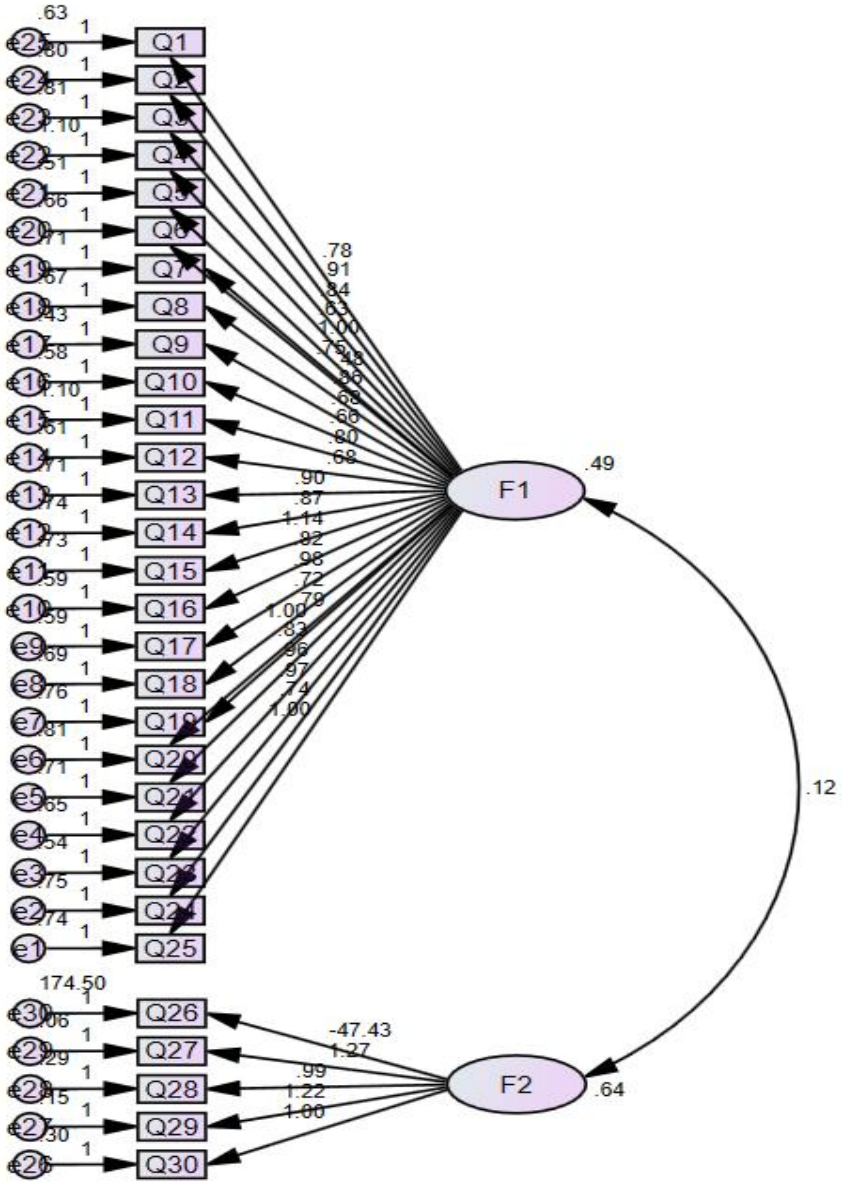
Table 2: *Final Factors, No. of Items Dropped and Final No. of Items Retained.*

Factor No.	Final Factors	No. of Items Dropped	Final No. of Items
1	Anxiety Manifestation	03	22
2	Phobic Tendencies	01	04

Overall, the final scale retained 26 items with 2 factors. The values of modification index were examine for error variances greater than 10. Various parameters indicated covariances among items that include Q15 & Q16 (e15 and e16: MI=47.70); Q17 and Q19 (e19 and e17: MI=33.02); Q4 & Q8 (e8 and e4: MI=24.60); Q5 & Q11 (e11 and e05: MI=22.88); Q16 & Q17 (e17 and e16: MI=19.90) and Q18 & Q19 (e19 and e18: MI=18.05. This lead to low variance of errors and good model fit values. The below model with 2 factors and 26 items indicated acceptable fit to the sample as CFI= .82. The GFI showed value of .77 and AGFI showed value of .69.

Figure 1

Original Model produced during CFA

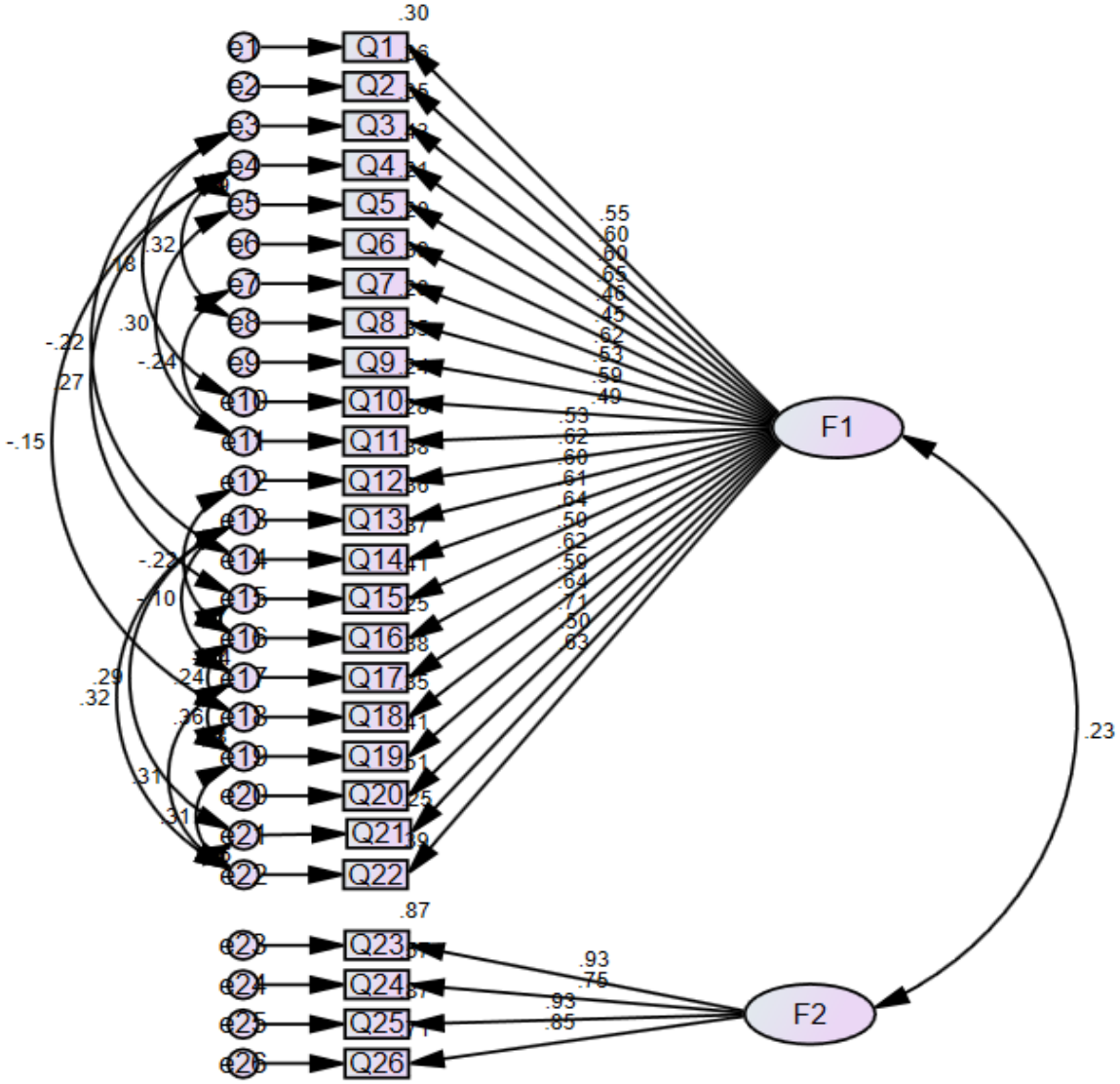


Key: F1 (Anxiety Manifestation), F2 (Phobic Tendencies)

Note: Above Model include 30 items.

Figure 2

Re-specified final Model after CFA



Key: F1 (Anxiety Manifestation), F2 (Phobic Tendencies)

Note: The Model resulted in 26 items.

3.7 Psychometric Properties

3.7.1 Test-Retest Reliability

To analyze the test-retest reliability, indigenous scale of anxiety symptoms was administered on same participants (N=30) after two weeks gap. Pearson product moment correlation was run to measure the test retest reliability of scale.

Table 3: *Test-Retest Reliability Correlation (r) of Full Scale and Subscales.*

Scale	Test-retest Reliability Coefficient (r)
Scale of Anxiety Symptoms	0.92***
Anxiety Manifestation	0.82***
Phobic Tendencies	0.80***

Note. *** p<0.001

Results indicated high test retest reliability as correlation between the scores of participants was 0.92*** (p<0.001). The strength for test retest reliability is classified as excellent if value is greater than 0.75 (Oremus et al., 2012). These findings showed that the indigenous scale of anxiety symptoms had excellent test-retest reliability.

3.7.2 Convergent Validity

Spence Children Anxiety Scale by Spence (1997) Urdu version was administered to measure convergent validity of indigenous scale of anxiety symptoms in adolescents (Rizwan et al., 2012). Spence Children Anxiety Scale and Indigenous Scale of Anxiety Symptoms in adolescents were administered on 40 participants.

Table 4: *Convergent Validity Correlation (r) of Scale.*

Scales	r	M	SD
Scale of Anxiety Symptoms	0.69**	47.17	12.74
Spence Children Anxiety Scale	0.69**	85.95	18.18

Results indicated significant positive correlation i.e. 0.69** (p<0.01) between indigenous scale of anxiety symptoms and Spence children anxiety scale. Convergent validity is usually considered as high if a correlation with a scale measuring the same construct is r≥ 0.70 (Abma et al., 2016). These findings showed that the indigenous scale of anxiety symptoms had established convergent validity.

3.7.3 Divergent Validity

Rosenberg Self-esteem Scale (Rosenberg, 1965) Urdu translation was used for determining divergent validity of indigenous scale of anxiety symptoms in adolescents. Rosenberg Self-esteem Scale and Indigenous Scale of Anxiety Symptoms in adolescents were administered on 40 participants.

Table 5: *Divergent Validity Correlation (r) of Scale.*

Scales	r	M	SD
Scale of Anxiety Symptoms	-0.34*	47.17	12.74
Rosenberg Self-esteem Scale	-0.34*	8.15	2.43

Results indicated significant negative correlation i.e. -0.34* (p<0.05) between indigenous scale of anxiety symptoms and Rosenberg Self-esteem Scale. According to Brown's cutoff scores, value of discriminant validity should be less than .05 (Brown, 2015). These results showed that the indigenous scale of anxiety symptoms had established divergent validity.

4. DISCUSSION

The present research focused on validation of newly developed indigenous scale of anxiety symptoms in adolescents by Khan et al., (2022) as well as development of psychometric properties of the scale. The newly developed scale passed through procedure of generation of items and EFA to explore the factors making it a good measure to assess anxiety symptoms among adolescents in the context of Pakistan. The indigenous scale of anxiety symptoms was developed on non-clinical sample (students). It is of utter importance to validate a newly developed scale on that specific population for which it is constructed. Through the confirmatory factor analysis (CFA) of the scale, it added to finite collection of indigenous scales and will thoroughly use for screening purpose in clinical as well as research domain. So, 30 items scale with two subscales was developed thorough exploratory factor analysis (Khan et al., 2022).

The Confirmatory factor analysis was used to verify the underlying factors of scale and factor-item relationship pattern of the indigenous scale of anxiety symptoms in adolescents after data collection. Values of Cronbach's alpha reliabilities of scale as well as subscales depicts high internal consistency as well as reliability. The data collected from clinical sample after screening was gone through EFA prior to CFA to explore final factors. EFA identified 2 final factors of anxiety (Anxiety Manifestation and Phobic Tendencies). As the researches indicate that the most fundamental model in confirmatory factor analysis is the one factor model, which assume that covariance or correlation among the items of the scale is merely due to a single common factor (Brown & Moore, 2012). So the final model was retained to 2 factor solution for CFA because at one factor solution the factors didn't rotate.

For CFA, the hypothesized model was made on AMOS 23 version. The model was based on prior exploratory factor analysis which showed two final factors of the scale. After calculating the estimates in model fit analysis, the values of CFI and RMSEA were in unacceptable range i.e. CFI = 0.716 and RMSEA = 0.116. The model was revised in order to fulfill the assumptions of good model fit and to improve values to marginal level. The original model in result section showed poor values of indices i.e. CFI, TLI, RMSEA etc. Therefore through modifications, various covariances of observed variables were added from modification indices of covariance. After the modifications the values of indices improved as reported in table 2. The CFI and RMSEA values improved to the marginal range for confirmatory factor analysis. The hypothesized model with 20 covariances within the same factor F1 (anxiety manifestation) was finalized with the model fit analysis. So that, through this method the newly developed indigenous scale of anxiety symptoms in adolescents was validated with TLI, RMSEA and CFI marginal fit values.

The subscale of Anxiety Manifestation had 22 items; it has strong correlation with the full scale i.e. 0.96. It has moderate standardized factor score i.e. 0.49. The covariances were added between various items through model fit indices. All the items that were allowed for covariance in F1 (Anxiety Manifestation) were related to anxiety symptoms of cognitive, emotional, physiological and behavioral nature. According to information processing model of anxiety by Beck and Clark (1997), there are three stages of perceiving threatened stimulus that result in anxiety symptoms. First is registering threatened stimulus, second is threat mode activation, third is secondary activation of reflective modes of thinking. Cognitive distortions also play the significant role in maximization of symptoms i.e. catastrophizing in anxiety. Individuals who acquire traits of feelings anxious across many situations since childhood conveyed heightened state and severe symptoms of anxiety in adolescent phase. They usually exhibit low self-esteem which inferred that adverse perception of one's self usually lead to feelings of inferiority. Thus the factor F1 (Anxiety Manifestation) emerged in the scale development of indigenous scale of anxiety symptoms in adolescent correlated highly to the whole scale i.e. 0.9 correlation value.

The subscale of phobic tendencies had 04 items; it has moderate correlation with full scale. It has .64 standardized factor score. No covariance was added between items of F2 (phobic tendencies) as the MI values for covariance of observed variables in F2 were low. The items Q23, Q24, Q25 and Q26 were finalized in F2 with good factor loading. These items were related to specific phobia. It include extreme fear of some specific object or particular situation. The manifestation of specific phobia in adolescents

includes excessive sweating, tightness in the chest, fast heart beat or racing heart, numbness and problem in breathing. When they see or notice any phobic stimuli thy feel nausea, fainting or dizziness (Bennett & Walkup, 2019). Hence the scale was finalized with 26 items and two subscales.

4.1 Investigation of Psychometric Properties of the Scale

Firstly test-retest reliability of scale was determined on sample of 30 participants. Pearson product moment correlation was run on the sample to measure the test retest reliability of scale. It was used for assessing the scale to be consistent across time on the same sample. The strength for test retest reliability is classified as poor or low if less than 0.40, if lie in the range of 0.40-0.75 than it's considered as fair to good (moderate) and greater than 0.75 excellent (Oremus et al., 2012). According the results of test-retest reliability analysis, the correlation coefficient value of the scale is ($r=0.92$, $p<0.001$) depicts excellent value and thus overall findings proven the scale to be a reliable measure.

The convergent validity of scale was established to make sure how closely a scale is relevant to other scales that assess the similar construct. So Spence Children Anxiety Scale (Spence, 1997) Urdu version used for measuring convergent validity of indigenous scale of anxiety symptoms in adolescents (Rizwan et al., 2012). Both Spence Children Anxiety Scale and indigenous scale of anxiety symptoms were administered on 40 participants simultaneously. Results indicated significant positive correlation i.e. 0.69** ($p<0.01$) between indigenous scale of anxiety symptoms and Spence children anxiety scale. Convergent validity measure the extent to which two or more scales or set of items correlate (Kline, 2005). Convergent validity is usually considered as high if a correlation with a scale measuring the same construct is $r\geq 0.70$ (Abma et al., 2016). The correlation score (r) of convergent validity of the indigenous scale of anxiety symptoms showed that the scale had well established convergent validity.

Divergent validity of scale was also established to measure the extent to which a scale measures aspects of phenomenon that vary from other construct that is assessed by other scales. Rosenberg Self-esteem Scale (Rosenberg, 1965) Urdu translation was used for determining divergent validity of indigenous scale of anxiety symptoms in adolescents. Rosenberg Self-esteem Scale and Indigenous Scale of Anxiety Symptoms in adolescents were administered on 40 participants simultaneously. Results indicated significant negative correlation i.e. -0.34* ($p<0.05$) between indigenous scale of anxiety symptoms and Rosenberg Self-esteem Scale. According to Brown's cutoff scores, value of discriminant validity should be less than .05 (Brown, 2015). These findings showed that the indigenous scale of anxiety symptoms had well established divergent validity.

5. CONCLUSION

The present study classified the scale into two final subscales named as anxiety manifestation and phobic tendencies validated through chi square model fitness. The developed scale of anxiety symptoms finalized 26 items. The scale results revealed that this scale prove to be reliable as well as valid measure to assess anxiety symptoms due to its good psychometric properties.

5.1 Strengths of the Study

This scale can be used as screening measure to assess symptoms of anxiety in Pakistani adolescents as no indigenous scale is available to measure this construct specifically for adolescents. The latent factor structure of scale was confirmed through present research by using confirmatory factor analysis which added to trustworthiness of subscales (factors) and their relationship with items. The test retest reliability, convergent as well as divergent validity of scale has been established which shows that it is highly reliable and valid scale. This indigenous scale is constructed in Urdu language and verified on clinical sample that contribute to generalizability of use of scale in Pakistani context.

5.2 Theoretical and Practical Implications

This scale can be effectively utilized across hospital settings, including both public and private sector hospital. It can also be used in academic setting for research purpose for further standardization of the

scale. This scale has subscales that covers main characteristics of generalized anxiety disorder (GAD), social anxiety disorder (SAD) and specific phobia. It can help in screening of anxiety features or anxiety disorders and could help in making management plan for therapeutic intervention.

5.3 Limitations and Directions for Future Research

This scale is a screening scale which gives only probable diagnosis for the anxiety disorder. The diagnosis should be confirmed by further evaluation. Norms and scoring manual of this scale were not developed yet so in future, standardization of the data should be carried out to develop the norms as well as scoring manual. The ratio of men and women should be equal in the data collected for study to see the gender difference like which group show high level of anxiety.

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Conflict of Interest

Authors declared NO conflict of interest.

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ORCID iDs

Rabia Bootay Khan [1] https://orcid.org/0009-0003-5919-1825
Humaira Naz [2] https://orcid.org/0000-0001-8903-6701

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