Development and Validation of Alexithymia Scale for Pakistani Population

Ambreen Fatima, Saba Ghayas
Department of Psychology
University of Sargodha, Sargodha

Rabia Khawar
Department of Applied Psychology
Government College University Faisalabad, Faisalabad

The present study was carried out to construct and validate a self-report measure of alexithymia (AS - 21). After pilot study, the factorial validity and internal consistency of the scale was determined on a sample of 863 subjects (men = 429, women = 434) of different age groups recruited from different cities of Punjab. Thirty-eight items were subjected to principal component analysis through Varimax rotation method. Results revealed a three factor solution with .82 alpha reliability. The three factors were named as Difficulty in recognizing emotions, Difficulty in expressing feelings and Lack of introspective awareness. Factor solution obtained by EFA was further confirmed and validated by the confirmatory factor analysis. Furthermore results revealed significant gender differences in alexithymia. Convergent validity of AS-21 was proved by finding positive correlation with Toronto Alexithymia Scale. The Alexithymia scale is a promising measure with good items homogeneity, internal consistency and a meaningful pattern of validity.

Keywords: Alexithymia, scale construction, reliability, validity

Sifneos (1973) introduced the term alexithymia (a = lack, lexis = word, thymos = emotions; the term literally means being devoid of emotions). The construct of alexithymia was not formulated until mid-1970s. In the beginning, the core symptoms of alexithymia were found among people having psychosomatic etiology. Besides this, some theorists stressed that alexithymic person suffers from paucity of introspective awareness, imagination and fantasy (Bruch, 1973), whereas later theorists suggested alexithymia as a trait rather than state (Saarijarvi, Salminen, & Toikka, 2001).

Alexithymia refers to difficulty in recognizing, communicating and distinguishing feelings from the related bodily sensations, restricted imagination, and lack of introspective awareness and low levels of empathy (Kerr, 2012). This disturbance affects a person's life in diverse aspects.

Results of various studies reflect that alexithymia has both absolute and relative stability over various periods of time; moreover salient features of alexithymia are normally distributed in the general population in both men and women. It shows deficits in cognitive processing as well as regulation of emotions (De Gucht, 2003; Picardim, Toni, & Caroppo, 2005; Saarijarvi, Salminen, & Toikka, 2006; Salminen, Saarijarvi, Toikka, Kauhanen & Aarela, 2006). Since the past few years, the term alexithymia has refined theoretically. At present this construct incorporates these underlying features: 1) Experiencing difficulty in feelings identification and related bodily sensations, 2) Difficulty in expressing feelings. 3) Lack of introspective awareness, 4) Restricted imagination (Nemiah, Freyberger & Sifneos, 1976).

The differences in dealing with emotions are evident across cultures Dion (1996) conducted a study upon Canadian students and explored that ethnic Chinese students scored higher on alexithymia than Anglo-Celtic and European ethno-cultural backgrounds. Furthermore, Le, Berenbaum and Raghavan (2002) reported difference in alexithymia between people belonging to Asian and Western cultures. They found that parents belonging to western cultures were more able to communicate positive emotions and display physical affection than the Asian parents. From these studies, it is depicted that the level of alexithymia varies in different cultures. The ability to communicate emotions is described as the central part of both men and women life (Bem, 1974). The evidence regarding gender differences in alexithymia is ambiguous. Some studies reported that men outscored women (Zaidi, Yaqoob & Malik, 2015; Mohsin, Buzdar, Mohsin, & Saleem, 2016), while some witnessed higher scores for women (Joukamaa et al., 2007; Kokkonen et al., 2001; Gunzelmann, Kupfer & Brahler, 2002), whereas some reported non-significant relation of alexithymia with gender (Karukivi, 2011; Sakkinen et al., 2007). Studies also reported that it was significantly correlated with age (Moriguchi et al., 2007; Bagby et al., 1994); while other researchers determined that it is not associated with age (Cohen, Auld, & Brooker, 1994; Pandey et al., 1996).

The way of identifying, expressing and managing emotions differs among cultures due to differences in language, social and ethical values (Taylor, Baggby & Parker, 2003). Thus, several theorists recommended developing culturally relevant scale. Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994) is the most widely used measure for alexithymia. Originally developed in English, it has been validated and translated in many cultures but after a series of researches, theorists explored that alexithymia was culturally bound measure, especially the third factor externally-oriented thinking (EOT) reported lack of reliability in cultures where English was not mother tongue. So, in order to accurately measure the alexithymia, it is required to have a test with cultural relevance (Cossette, Frasure-Smith, & Lesperance, 2001; Taylor, Baggby, & Parker, 2003). Awareness of the importance of

alexithymia in Pakistan, especially with respect to scale development led our research. The paucity of research in this field might be due to the non-availability of a culturally relevant scale. In order to understand emotional disturbances and lack of feelings, an alexithymia scale was developed in Pakistan.

Objectives

1. To develop a self-report measure of alexithymia for people of different age groups in Pakistan.
2. To examine psychometric properties of Alexithymia Scale.
3. To measure gender and age differences in the level of alexithymia.

Method

Study I: Development of Alexithymia Scale

Study I comprised three steps. Items of alexithymia scale were generated in step I, and in step II, selected items were factor analyzed to determine the hypothetical structure of the scale. In step III, confirmatory factor analysis and reliability analysis was carried out.

Step I: Generation of items for Alexithymia Scale. Items were produced through both inductive and deductive approaches. In order to get the indigenous view about the construct, a proforma was developed containing 15 questions and applied on 200 participants of different age groups with heterogeneous characteristics. Sifneos model (1973) was also consulted as it was the only available model of alexithymia. Item pool was presented to a committee comprised of seven judges (5 assistant professors and 2 lecturers from the department of Psychology). On the basis of consensus, 48 items were retained following these selection criteria: construct fidelity, clarity of statement and concept, comprehensibility and redundancy. In order to arrange the items in a general to more specified content, item sequence was shuffled. The response format of AS-21 was four point likert type where, 1 = strongly disagree, 2 = disagree, 3 = agree and 4= strongly agree.

In order to ensure the psychometric properties and cleansing of items, a pilot study was carried out on a sample of 100 participants with age range 19- 65 years (M = 38.9, SD = 12.1). Kolmogorovo-Smirnov test was applied to check the normality of items, 10 items were deleted due to not fulfilling the assumptions of normality. After scrutiny, only 38 items were selected for factor analysis and to determine the theoretical structure of the scale.

Step II: Exploratory Factor Analysis

Sample

A convenient sample of 863 participants including both men (n = 429) and women (n= 434) was recruited from rural and urban areas of Punjab, in order to acquire the representative sample of the study. Age of the sample ranged from 17 to 90 years (M = 30.41, SD = 13.67). Minimum education of the sample was matriculation and maximum was PhD.

Procedure

Subjects of the study were approached at different venues - homes, schools, colleges, hospitals & banks, etc. - and the purpose of the study was briefed to them. After taking their informed consent, participants were requested to provide accurate and honest information. They were assured that the information taken from them will be kept confidential and would be used only for study purpose. Moreover, participants were told that they were allowed to withdraw from the participation at any point during the research work. At the end, participants were thanked for their cooperation.

Results

Data of 863 participants were subjected to exploratory factor analysis by using varimax rotation method. Initial analysis revealed the factor solution that converged in 40 iterations. Principal Component Analysis (PCA) yielded 5 factor solutions. We followed the criterion of Kaiser (1960) and 3 well defined, interpretable, clear and accurate factors were retained on the bases of scree plot, item loading > .40, Eigen values > 1.0 and theoretical relevance. The content of each item of the three subscales were analyzed and were named accordingly.

Table 1

The Factor Loading of 21 Items on Alexithymia Scale and on Three Factor Solution Obtained through Varimax Rotation Method (N =863)

	Factors		
	I	II	III
New item no	Difficulty in Recognizing Emotions	Difficulty in Expressing Feelings	Lack of Introspective Awareness
1	**.47**	.23	.29
2	**.44**	.19	.08
3	**.47**	.31	.19
4	**.56**	.32	.15
5	**.44**	.19	.28
6	**.47**	-.21	.23
7	**.54**	.23	.15
8	**.51**	.17	-.22
9	.23	**.66**	.23
10	-.19	**.66**	.07
11	.25	**.58**	.15
12	.16	**.53**	-.12
13	.12	**.64**	.22
14	.17	**.68**	.15
15	.27	**.44**	.33
16	-.09	**.47**	-.23
17	-.13	.29	**.51**
18	.08	.18	**.58**
19	.17	-.23	**.59**
20	.21	.17	**.59**
21	.22	.25	**.64**
Eigen Values	4.59	4.36	2.38
% of variance explained	12.07	11.47	6.27
Cumulative variance	12.07	23.55	30.0

Factor 1: Difficulty in Recognizing Emotions
Factor 2: Difficulty in Expressing Feelings

Factor 3: Lack of Introspective Awareness

Significant amount of variance (30%) is accounted for by these retained factors. It is considered that cumulative variance should be at least 50 percent but according to Williams, Brown and Onsman (2012) cumulative percentage of variance is one area of disagreement in factor analysis. There is no fixed threshold for the value of cumulative variance as the construct are of very different nature. High level of percentage is expected in natural sciences but low value is acceptable in humanities and social sciences. Decision about the extraction of factors should be taken on the basis of multiple criteria.

Eigen value for factor I was 4.59 and 12.07% variance is explained by this factor. Factor II had Eigen value 4.36 and explained 11.47% variance whereas the Eigen value for factor III was 2.38 and the variance is 6.27. Factor structure appeared to be different from the model of Sifneos (1973).

Step III: Confirmatory Factor Analysis (CFA) and Internal Consistency

Factors retained after EFA were put to CFA by using AMOS 20.0 version in order to confirm the measurement model of Alexithymia Scale to ensure the factor structure and dimensionality of instrument. In order to run CFA another sample was taken from 314 participants selected through convenient sampling. Age range of the sample was 18 to 55 (*M*=32.3, *SD*=5.1). Men and women both were given equal representation in the sample. Range of education was from matriculation to post graduation. In the current study various indices and criteria were checked to explain the best model fit (CFI, GFI, RMSEA and TLI).

Table 2

Model Fit Indices of CFA for Alexithymia Scale (N = 314)

Indexes	χ^2	*df*	CFI	RMSEA	GFI
Model	460.9	186	.90	.06	.90

Based on the initial criteria (i.e., item loading > .35), the model obtained through EFA was examined in CFA and this factor structure showed a good fit to the data with chi square 460.9 (*df*= 186) <.01, CFI =.90, GFI = .90, and RMSEA = .06. The factor loadings ranged from .43 to .73. Results of CFA revealed that model is fit with three factor structure and 21 items.
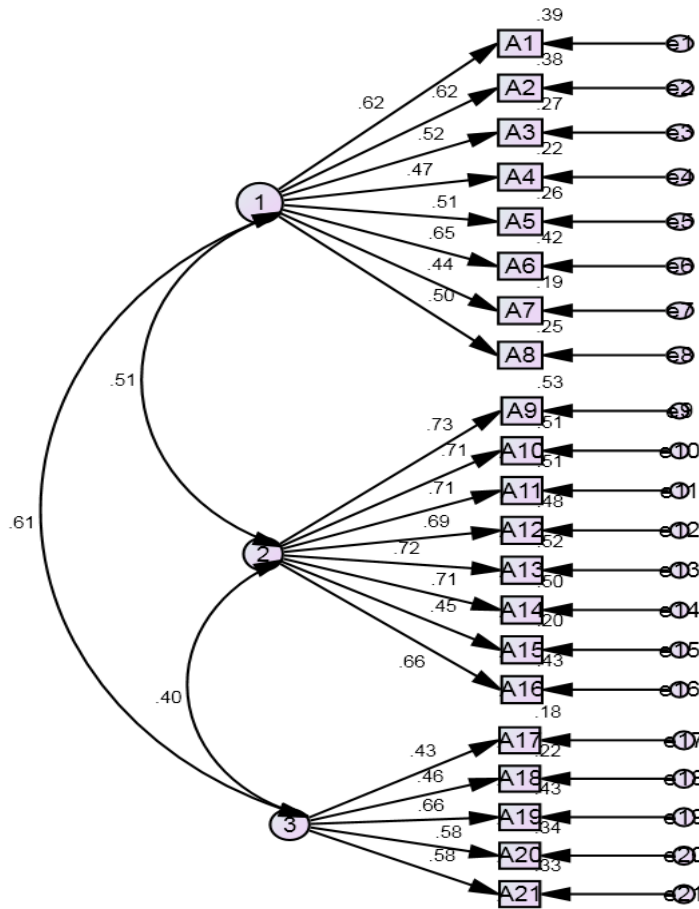
Table 3
Means, Standard deviations, Alpha Reliabilities and Correlation Matrix of Subscales of Alexithymia Scale (AS-21) (N = 863)

Variables	M	SD	α	1	2	3	4
1. Difficulty in Recognizing Emotions	15.79	4.93	.76	--	.58**	.13**	.85**
2. Difficulty in Expressing Feelings	15.66	5.13	.79		--	.096**	.85**
3. Lack of Introspective Awareness	10.03	2.92	.60			--	.41**
4. Alexithymia Scale	41.50	9.76	.82				--

**p<.01

Table 4
Mean, Standard Deviation, Significance Level and t-values of Men and Women on Total and Subscales of Alexithymia Scale (N = 863)

	Men (n = 429)		Women (n = 434)			95% CI		Cohen's d
Variables	M	SD	M	SD	t(314)	LL	UL	
AS-21	40.71	9.86	42.28	9.63	2.37*	-2.87	-.27	-0.16
DRE	15.73	5.02	15.87	4.85	.429	-.80	.52	-0.02
DEF	14.89	5.08	16.44	5.08	.4.47**	-2.23	-.87	-0.31
LIA	10.09	2.98	9.97	2.87	.586	-.27	.50	0.04

Note. AS= Alexithymia Scale; DRE= Difficulty in Recognizing Emotions; DDF= Difficulty in Expressing Feelings; EOT= Lack of Introspective Awareness.
*p< .05, **p < .01

Internal Consistency. Reliability analysis and independent sample t-test was carried out the sample taken for the step II of the current study. Reliability analysis was run to check the internal consistency of AS-21 and the Cronbach's Alpha reliability was found to be high at α = .82. Coefficient alpha of all subscales indicate high internal consistency. An estimation of item to total correlation yielded that all the items were positively and significantly correlated with the total scale. The maximum possible score for the scale is 84 and minimum possible score is 21. As the scale is measuring alexithymia as a trait therefore higher the score, higher is the level of alexithymia and lower score indicates the low level of alexithymia.

Gender based primary group differences were calculated for total scale and its subscales. Mean and standard deviation reflects that women got significantly higher mean scores on alexithymia scale (*M* = 42.28, *SD* = 9.63) than the men (*M* = 40.71, *SD* = 9.86) and the differences are found to be significant at {*t* (314) = 2.37, *p* < .05}. Gender differences are also found to be significant on the subscale of difficulty in expressing feelings {*t* (314) = 4.47, *p* < .001}, where women got higher mean scores (*M* = 16.44, *SD* = 5.08) than men (*M* = 14.89, *SD* = 5.08). Results also portrayed non-significant gender differences in subscales of DRE and LIA.

Study II: Convergent Validity of Alexithymia Scale (AS-21)

Convergent validity of Alexithymia Scale (AS-21) was established by assessing its correlation with the Urdu translated 20 item version of Toronto Alexithymia Scale (Ghayas, 2012).

Sample

The sample of 58 students including both men and women, ranging in age from 19-25 years (*M* = 21.19, *SD* = 1.94) was recruited from University of Sargodha and data were collected through convenient sampling technique.

Instruments

Alexithymia Scale (AS-21) Scale. It is a 21 items self-report measure with three well defined factors a) difficulty in recognizing emotions (9,10, 11, 12, 14, 19, 20 and 21) , b) difficulty in expressing feelings (1, 2, 4,5, 6, 7, 8 and 17) and the third factor is lack of introspective awareness (3, 13, 15, 16 and 18). Respondents use four point likert type response formats, that ranges from 1 (strongly disagree) to 4 (strongly agree). Five items (3, 13, 15, 16 and 18) need reverse coding. The Cronbach's alpha of alexithymia scale is α = .82, and the alpha reliabilities of the three factors were ranging from .60 to .79. The highest scores could be 84 and the lowest scores could be 21 on alexithymia scale.

Toronto Alexithymia Scale (TAS-20) *(Bagby et al., 1994).* TAS-20 has 20 items with three subscales difficulty describing feelings, difficulty identifying emotions and externally oriented thinking. Alpha reliability of the scale was α = .81 and the test retest reliability is .77. It is based on 5 point likert type scales rating from strongly agree to strongly disagree. Five items needed reverse coding (4, 5, 10, 18 and 19).

Procedure

Both measures of Alexithymia were administered on 100 participants with age range 21 to 45 (*M*=32.1, *SD*=7.1). Data were gathered from convenient sample in different venues. Subjects were instructed to fill the questionnaires and were requested not to skip any question.

Results

Outcomes of the Pearson correlation indicate that Alexithymia Scale (AS-21) positively and significantly correlates with Toronto alexithymia scale (*r* = .66, *p* <.01).

Table 5

Correlation of Alexithymia Scale with the TAS-20 (N = 100)

Variables	Toronto Alexithymia Scale TAS-20
Alexithymia scale	.66**

**$p< .01$

Discussion

The present study was conducted to develop a trait based self-report alexithymia scale. An emerging question in alexithymia literature is whether the construct is generalizable in diverse cultures? Several theorists suggested that alexithymia is culturally bound construct (Cossette et al., 2001; Kirmayer, 1987; Taylor et al., 2003). Thus the present study aimed to develop a reliable and valid scale of alexithymia in indigenous culture.

Principal component analysis was carried out upon 38 items to assess the data of 863 participants through Varimax rotation method and three factors with 21 items were retained. The first factor namely difficulty in recognizing emotions measures experiencing difficulty to identify, comprehend and understand ones and other's emotions in an appropriate way. Items in the second factor reflected difficulty to express and communicate one's emotions and was named as difficulty in expressing feelings. Items belonging to third factor reflected concrete, poor introspective thinking, constricted imagination. So this factor was labeled as lack of introspective awareness.

Examination of the scale and subscales of alexithymia revealed that the newly developed structure of the scale was quite comparable to the dimensions explained by Sifneos (1973). Moreover it was also found that items related to lack of introspective awareness and constricted imagination loaded on the single factor in this indigenous culture such as item number 19 retained in factor 3 measures the ability to assess constricted imagination. Investigation based upon theoretical grounds of externally oriented thinking and constricted imagination ascertained their conceptual equivalence; because both measure the ability to focus upon external world rather than internal or imaginative world (Parker, Baggy, Shaughnessy, Wood, & Majeski, 2003).

In order to confirm and validate factor structure, confirmatory factor analysis was carried out which revealed a good model fit to the data and all the items loaded independently on their respective factors. Reliability analysis was carried out to establish internal consistency of the scale and subscales. Results showed that the scale was internally consistent and reliable. Items total correlations were also examined to see which items were significantly and positively correlated with the total AS-21. Items total correlations of all subscales are > .3. Items total correlations for each subscale were also calculated which were significant and all correlations were greater than .3.

Inter-correlations between subscales of alexithymia were also calculated that were significant and positively related to each other. All the correlations were found to be highly significant. High correlation between factor I and factor II was found which revealed that the person who was able to identify and understand own emotions can better communicate them with others. Correlations of subscales with the total AS-21 were also found to be significant, which implies that all subscales are distinct from each other (see in Table 2).

Construct validity of alexithymia scale was established by examining gender differences based upon their theoretical underpinnings. This procedure is recommended by the Day (2004) for evaluating construct validity. Group differences were determined on the normative sample of (863) subjects. Gender differences were the main group based differences that were calculated with respect to alexithymia. In the current study females scored significantly higher on total and DEF subscale of alexithymia (see Table 3).

The results of present study are supported by the existing literature (e.g. Gunzelmann, Kupfer, & Brahler, 2002; Kokkonen et al., 2001). Joukamaa et al., (2007) found gender differences in alexithymia and higher level of alexithymia among women than men. Furthermore Nishimura, Komaki, Igarashi, Moriguchi, Kajiwara and Akasaka (2009) and Gunzelmann et al., (2002) reported that women scored higher on difficulty in describing feelings (DDF) and difficulty in identifying feelings (DIF) subscale as compared to men and these results are supported by (Kokkonen et al., 2001). Furthermore another research evidence depicted that men scored higher on the external-oriented thinking (EOT).

The underlying reason that why women scored higher on alexithymia rather than men could be that differences in sex role and socialization determined gender differences (Brody, 1985). Culture like Pakistan where women are generally encouraged to pay much attention on others emotional and physical needs rather than their own, adjust in all type of circumstances, moreover Pakistani women are generally considered reluctant to express their feelings, and emotions openly while men have the freedom and power to rule/govern others and can freely express their own emotional states. So, that could be the reason due to which women scored higher on difficulty in describing feelings subscale of alexithymia. In contrary, non-significant differences on remaining subscales (difficulty in recognizing emotions and lack of introspective awareness) revealing greater ability in identifying feelings but the dilemma is that they are not given open space to express them and their socialization plays important role in suppressing their emotions from others .

The present study also established the convergent validity of newly developed Alexithymia Scale (AS-21). The evidence for the convergent validity derived from the positive and significant correlation between Alexithymia Scale and Toronto Alexithymia Scale. Results indicated that all the correlation between subscales of alexithymia with TAS-20 was found to be significant and positive. Strong correlation between difficulty in recognizing emotions subscale and TAS-20 suggests that it is important facet of alexithymia measured by both constructs.

Limitations and Future Recommendations

The study has limited generalizability as the data were collected only from few cities of the Punjab, so in order to enhance the external validity further researches should be conducted on a large and diverse sample.

Peer rating was not used to determine construct validity of AS-21 so future researches should use peer rating to assess constructs validity.

Equal numbers of subjects were not recruited for age groups, educational level and gender which can also influence the findings. It is suggested for the future work to have equal number of subjects to find a clearer and broader picture of results.

Implication

Each and every culture has its own way to express emotions and it arise the need to use culturally relevant tool to assess alexithymia.

So the current findings have worthy importance regarding the development of scale (AS-21), it will help increase interest in this area in Pakistan. The current findings can be very insightful for people associated with the psychological fields such as psychiatrists, psychologists, and psychotherapist, educationalists, counselors, and clinicians. They can develop such programs which can train the individuals to be aware of their emotions and to use appropriate words to express their emotions and feelings consistent with situations.

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