FACTOR STRUCTURE OF STATE TRAIT ANGER EXPRESSION INVENTORY IN URDU: A SYSTEMATIC REVIEW STUDY OF HYPERTENSIVE PATIENTS

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ABSTRACT

Anger assessment has got increasing attention of psychologists due to its great role in developing hypertension and heart diseases. In the present research, STAXI by Spielberger (1988) 44 items was translated and adapted into Urdu language to assess anger among hypertensive patients using back translation technique and validated through correlations, reliability analysis, factor analysis and independent samples t test. Reliability study was conducted by using alternate form method and sufficient alpha coefficients on subscales of STAXI were found. In the 2nd study a sample of 287 (hypertensive patients =163, non-hypertensive = 124) was taken from hospitals. Predictive validity was estimated by using logistic regression analysis with hypertensive and non hypertensive groups. Construct validity of the developed scale was established by using the method of contrasted groups. The alpha coefficients for factors of STAXI Urdu ranged from .61-.95. Exploratory factor analysis yielded a seven factor solution for Urdu STAXI. The factor structure was reasonably robust, whereas internal consistency and alternate form reliability were excellent. Logistic regression indicated that state anger, trait anger, anger-

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in, anger-control and anger turned out to be the strongest predictors of hypertension. Significant group differences on STAXI indicated construct validity of the adapted scale.

Keywords: State anger, Trait anger, Anger-in, Anger-out, Anger-control, Anger-expression

INTRODUCTION

Anger has been a topic of concerns for health practitioners and psychologists due to its great role in the development of hypertension and heart diseases. Anger is a normal emotion but if amplifies cause overwhelming effects upon human physique. Spielberger (2003) elucidates anger as an emotional state which consists of feelings from mild irritation to intense fury and is different among individuals in terms of intensity. Findings from earlier studies have reported that anger is an important natural emotion (Spielberger, Jacob, Russell & Crane, 1983) which has lethal physical repercussions and most conspicuously to heart (Williams, Javier, Sanford, Couper & Tyroler, 2002). Especially continuous outbursts of anger can impair physical and psychological health of the individual (Spielberger, Reheiser & Sydeman, 1995). Given these, it is recommended that effective anger management techniques should be introduced to enhance the health and quality of life of general people.

Widespread evidence supports that anger and hostility are related to heart disease (Borteyrou, Bruchon-Schweitzer & Spielberger, 2008). Close relationship between hypertension and anger suppression is reported by many investigations which explain that being easily enraged could be a reason of hypertension. Researchers have established relationship of anger with hypertension and hypertension is a well-known risk factor of coronary heart disease (Player, King, Mainous & Geesey, 2007; Rutelage & Hogan, 2002).

Anger is a comprehensive emotion which is mainly exhibited in two forms, anger expression and suppression. The expression of anger differs from culture to culture, even though it contains some common features which are exhibited across cultures. The role of anger in physical diseases arouse the attention of psychologists and researchers to measure it accurately and find its deep rooted relationship with health complexities, which is impossible without measuring it properly. Though many scales measure anger (Anger Self Report 1972; Novaco Anger Scale 1975; State-Trait Anger Scale (STAS, 1980), Jacob's

Pediatric Anger and Anxiety Scale and Jacob's Pediatric Anger Expression Scale), adapting different methods of assessment, STAXI by Spielberger (1988) due to its scholarly range of anger dimensions and its excellent psychometric properties, has led to its frequent use in clinical diagnoses and research purposes throughout the world and has adapted into many languages, i.e. in French by Borteyrou et al., 2008; in Russian by Kassinove, Sukhodolsky, Eckhardt, and Tsytsarev 1997. Many researchers have found the reliability and validity of STAXI across the world (Bishop & Quah, 1998; Haseth, 1996; Van Der Ploeg, Defares, & Spielberger, 1988). Ford, Vitelli, and Stuckless (1996) used STAXI to check the reliability and validity of computer based trait anger.

STAXI is a standardized tool for the measurement of anger with different components. The standard questionnaires are often used for data collection purposes in cross cultural studies (Drenth, Thierry & Wolff, 1998). According to Hambleton, Merenda and Spielberger (2005) words describe emotional states and personality traits, and the feelings related to a particular emotion reflect the unique aspect of a particular culture, are deeply influenced by cultural variation. Language differences contribute a lot in cross cultural variation (Stricker et al., 2003). Here a huge problem comes in the form of illiteracy or non acquaintance of a foreign language (Kazarian & Evans, 1998). Therefore it is suggested to translate standardized tests for their cross cultural application (Weiner, Freedheim, Graham, Schinka, Naglieri & Velicer, 2003). Many English standardized tests have been translated into other languages. The translation and adaptation of a test would make it culturally sensitive and useful in further research. There are many important things which a test developer should consider while developing a test. Among them the most important are to maintain construct validity, factorial validity and reliability analysis. One another aspect of a good test is having "transplant validation" in the target population (Kazarian & Evans, 1998).

The STAXI is prepared according to state and trait theory of personality (Eckhardt, Norlander, & Deffenbacher, 2004) and is widely used in research on anger (Martin et al., 2003) among different populations. Forensic research on prisoners (Suter, Byrne, Byrne, Howells, & Day, 2002), patients with schizophrenia (Chan, Lu, Tseng, Chou, 2003), anger among nurses (Engin & Cam, 2006), drivers (Deffenbacher, Oetting, Thwaites, Lynch, Baker & Thacker, et al., 1996), on infertile couples (Fassino, Pierò, Boggio, Piccioni, & Garzaro, 2002), with wound healing process among youngsters (Gouin, Janice, Kiecolt-

Glaser, Malarkey, & Glaser, 2008) and to assess anger among incarcerated women (Riaz & Agha, 2012) are some of the examples.

STAXI has been extensively used in health psychology and many investigations were conducted to find association of anger to caner, renal disease, cardiac output and hypertension (Deffenbacher et al., 1996; Spielberger, 1988; Spielberger et al., 1995). STAXI was in a research to explore the relationship of state and trait aspects of anger with hypertension (Sinclair, Czech, Joyner, & Munkasy, 2009).

State and trait anger scales of STAXI were developed by using a rational empirical approach, selecting the items with current experiences of angry feelings and the frequency of anger experiences over a wide range of situations. Spielberger (1988) elaborate that STAXI is simple to administer and independently assesses different measures of experience, expression, and control of anger. Spielberger also explain STAXI subscales were developed through administering a wide-range normative sample and their internal factor structure is completely well integrated but distinct from one another and an association was found between STAXI subscales with other self-report scales.

State anger scale of STAXI assesses current anger state at the occurrence of any emotional event whereas trait anger scale assesses how with the passage of time angry feelings become dispositional. STAXI consists of 3 sections which are State Anger, Trait Anger and Anger Expression. State and Trait components of STAXI comprised of ten items each which measure one's tendency to experience anger (Sinclair et al., 2009). Last component of STAXI deals with ways in which a person expresses and controls anger. It consists of twenty four items and following sub scales, (a) anger expression-in (AX-I), (b) anger expression-out (AX-O) and (c) anger expression-control (AX-C). To combine these 3 subscales into one is called anger expression (AX).

STAXI is considered a leading anger measurement tool and requires high command in English language to differentiate between analogous words. There are some restrictions in quantifying the subjective experience of anger like entering the threshold of anger, experience it, express it, cultural norms, value and belief system, religious factor, previous conditioning, history, self concept and general concept of anger with in a society. All these variables make it a multifarious construct which is difficult to measure accurately.

Majority of the Pakistani population has not a perfect command on English to understand the metaphors, similes or other ambiguities used in English language. Although STAXI is considered an authority and a gem of measuring anger, still while conducting in English there are some problems to interpret the minute differences between words like *irritate, annoys, infuriate, furious* and *angry* etc. Therefore, the present study was undertaken to translate and adapt STAXI into Urdu and to (1) determine reliability, validity and factor structure of the translated version, and (2) to determine construct validity of the adapted tool among hypertensive patients.

METHOD

(STUDY 1)

The current study was conducted for the translation and back translation of vocabulary which was semantically related to different components of anger for use in psychological and clinical settings. The study was conducted in 3 phases.

Phase I

Participants

The translators for the present study consisted of (a) 16 hypertensive patients. They were selected from outdoor departments of 2 public hospitals by using purposive sampling technique.

Sixteen clinically diagnosed bilingual hypertensive patients were selected from outdoor departments of hospitals. The inclusion criteria used while selecting the patients, judges and back translators was (a) Pakistani national (b) age range 40-65 (c) 14 years of education (d) bilingual (e) clinically diagnosed hypertensive patients who have been taking antihypertensive medicines for the last six months.

Back translation was undertaken by 3 highly qualified professionals who were chosen for their literacy and intellectual worth, being bilinguals.

Measures

A demographic information form was developed by the researchers in order to gather information about age, marital status, education, job status family history of hypertension and monthly income of the research participants.

STAXI by Spielberger is a self reported inventory to assess anger. It comprises of 44 items which are divided into 6 scales. First 10 items measure the intensity of SA (state anger) as an emotional state. Next 10 items assess the intensity of anger as a personality trait (TA). Third part is composed of 24 items. It assesses either the intensity of feeling or the frequency with which it is expressed. Four kinds of anger are assessed through it. They are anger-in (AX/IN), anger-out (AX/OUT), anger- control (AX/C) and an index of anger expression (AX/EX). Each item has 4 optional responses which are scored on a 4-point Likert scale from *1 not at all to 4 very much so*. The respondents can obtain scores from 44 to 76. Higher scores indicate higher level of anger in all cases. Spielberger (1988) reported that STAXI has high internal consistency with Cronbach's $\alpha = .95$.

Qaumi English-Urdu Dictionary (English into Urdu) by Jalibi (1994) was used as a measure of 1st Urdu translation. Baba-i-Urdu Dictionary (English into Urdu) by Haq (1987) was used to assess the 2nd Urdu translation. Oxford Advanced Learner's English Dictionary (English into English) by Hornby, (1993) was selected to validate the true essence of meanings.

Procedure

In the first step all words containing in sentences of STAXI were translated into Urdu language with the help of 3 standard dictionaries. The meaning of each English word was translated twice in Urdu and once in English. After confirming from all 3 dictionaries the meaning of each word was selected and a sentence into Urdu was formed. Two choices in Urdu were created keeping in view the closeness of meaning and consistency of explanation /connotation. Then these were given to 8 independent experts and 8 clinically diagnosed hypertension patients for the selection of one most appropriate translation. Both patients and experts recommended some changes in the translations and also suggested some new words or sentences and many of the sentences were entirely changed or deleted. Two PhD scholars interpreted the given suggestions and made analysis which translation to be included in the final Urdu list. At this stage

percentage of agreement among all experts and patients was derived using the formula described by Cohen and Swordilk (2012).

The percentage of selected items was found and if it exceeded 60 on any one translation then these items were retained and included in the next list. At last, a final list of 44 sentences in Urdu was generated on the basis of the aforesaid procedure for the back translation step.

Phase 2

Back Translation

Back translation of the finally prepared Urdu list of STAXI into English language was carried out by 3 independent bilingual experts. The list was given to them and they were individually requested to translate it back into English giving a precise and correct translation of each sentence. In this way 3 lists were prepared and available for use, one from each expert, (1) original STAXI, (2) back translation of expert 1, (3) back translation of expert 2, (3) back translation of expert 3. These 3 back translations were evaluated by 2 language experts and were compared with the original STAXI and majority concordance was found. The following calculating procedure was formulated for finding concordance among the back translations.

Complete concordance was found when there was full agreement of sentences in the obtained 3 lists with original STAXI; the overall concordance was 100%. These sentences were uphold, and resulting in a list of 36 sentences. Majority concordance was calculated when 2 lists out of 3 given lists (STAXI + translation 1 & 2) were in agreement and obtained 66% then it was maintained and resulted in a list of 7 sentences. Average concordance was assessed when 1 list out of 3 given was in agreement with original scale, these were given a score of 33%, and 1 such item was retained. The inter judge agreement of the 3 back translators was obtained and English version of original STAXI was prepared to used in the reliability study.

Phase 3

Psychometric properties of the Urdu version of STAXI

In the 2nd study psychometric properties of the translated versions of STAXI were determined through a standardized procedure.

Method and Research Design

A counter balance research design was used for the present study. Alternate form reliability analysis was run to explore within and between versions correlations and to calculate Cronbach alpha of the subscales.

Sample and Sampling Strategies

The data was collected from 48 hypertensive patients. Among all participants male participants were 75% (36) and females were 25% (12). Respondents' age range was from 30-65 years ($M= 45$, $SD= 9.57$). Their minimum education level was F.A/ F. Sc. and maximum level of education was PhD. Of these 48 participants 76% (38) were married and 24% (10) were unmarried, about 68% (33) respondents' were doing job, 22% (9) business and 10% (6) both job and part time business. Their number of dependents ranged from 1 to 6. Similarly the monthly income of the respondents' ranged from Rs. 2000 to 55000. All Participants were equally divided into two groups.

Measures

Three kinds of forms were used in the present study.

Form A

The English back translation of STAXI produced in previous study.

Form B

The finally prepared Urdu translation.

Demographic Information Form

A demographic information form was developed to gather information about age, marital status, education, occupation, dependants, family history of hypertension and monthly income of the research participants.

Procedure

Informed consent was obtained and participants were handed over the forms. All forms (A & B) were labeled with code numbers of 1 to24 and 25 to 48. Every participant's identity was preserved through code number assigned to demographic sheet. In the start group 1 was administered form A. Then after the pause of 15 days they were approached again in the hospital when they visited the hospital for routine medical checkup and were administered form B. Similarly group 2 was first administered form B and then form A. The whole process was done in a counter balanced way till the completion of all forms (A & B) from the same participants.

Statistical analysis

In order to evaluate the psychometric properties of the Urdu STAXI initially Pearson correlation was calculated to explore the relationship between subscales of STAXI at 3 levels, (1) within English version subscales, (2) between English and Urdu versions of STAXI subscales and (3) within subscales of Urdu versions. Cronbach alpha coefficients were calculated to assess the inter-item consistency. In 2nd study, a principal component analysis using varimax rotation was used to the 44 item (STAXI) to determine the factor structure of the anger expression construct. Exploratory factor analysis remained a valid method to determine the number of factors in a data set by grouping variables that have relationship (Tabachnick & Fidell, 2007). The assumption regarding sample size recommended by researchers is subject to item ratio is 10:1, was not followed due to short of time and could collected data from a sample of 287. The number of factors was confirmed on the bases of scree plot, eigen values, cumulative percentages and mean eigen values. The items with factor loading .40 and above were maintained as recommended (Tabachnick & Fidell, 2001). Further, to ensure the incremental validity of our scale we performed logistic regression analysis. Hypertension was taken as outcome variable and was given dummy coding (hypertensive patients = 1, non-hypertensives = 0). Anger and its subscales were taken as independent and predicting variables of hypertension and were studied as continuous scale. Moreover, construct validity of the Urdu scale was established by examining differences on anger subscales by method of contrasted groups. Similarly predictive validity of the scale was established by using logistic regression analysis and anger was assessed as predictor of hypertension.

RESULTS

An evaluation of items to total correlation yielded that all the items were significantly correlated with all subscales and with total English and Urdu versions and the correlation is highly significant at .01. ($r = .32$ to $r = .81$, $r = .41$ to $r = .76$), (Table 1 & 2). Between group (English and Urdu Forms of STAXI) and within group (Urdu Form) inter-correlations also indicated significant positive correlation (Table 3). In order to find out the internal consistency of the scale, reliability analysis was run. Cronbach alpha coefficient for the scale was= .94, and was established reasonably high for all 5 factors, ranging from= .66 (AX/Out) to= .95 (SA) (Table 4).

Table 1
Correlation within SA, TA, AX/In, AX/Out, AX/Con, AX/EX and Anger of English version of STAXI (N =48)

Subscales of STAXI	*M*	*SD*	1	II	III	IV	V	VI	VII
SA	15.94	3.52	1						
TA	24.28	6.42	.57**	1					
AX/In	17.39	3.52	.25	.43**	1				
AX/Out	15.07	2.27	.02	.25	-.19	1			
AX/Con	27.75	3.09	.13	.14	.66**	-.39	1		
AX/EX	27.71	3.65	.16	.46**	.36**	.69**	-.32*	1	
Anger Total	68.92	12.87	.70**	.81**	.71**	.31*	.32*	.63**	1

SA (State anger), TA (Trait anger), AX/In (Anger-in), AX/Out (Anger-out), AX/Con (Anger-control), AX/EX (Anger-expression) *$p < .05$, **$p < .01$

Table 2

Correlation within SA, TA, AX/In, AX/Out, AX/Con, AX/EX and Anger of Urdu version of STAXI (N = 48)

Subscales (Urdu)	*M*	*SD*	1	II	III	IV	V	VI	VII
SA	16.21	3.24	1						
TA	23.87	6.49	.52	1					
AX/In	16.40	3.48	.24	.46**	1				
AX/Out	14.10	2.11	-.06	.22	-.16	1			
AX/Con	20.75	3.07	.16	.21	.64**	-.27	1		
AX/Expression	26.61	3.61	.09	.31**	.41**	.64**	-.25	1	
Anger Total	67.80	11.80	.66**	.76**	.76**	.23	.41**	.59**	1

M = Mean, SD = Standard Deviation

Table 3

Correlations between SA, TA, AX/In, AX/Out, AX/Con, AX/Expression and anger total of English and Urdu versions of STAXI (N = 48)

Subscales of STAXI Urdu	Subscales of STAXI English						
	SA	TA	AX/IN	AX/OUT	AX/CON	AX/EX	Anger
SA	.94**	.54**	.25	.00	.16	.13	.66**
TA	.51**	.76**	.46**	.17	.21	.39**	.72**
AX/In	.25	.43**	.96**	-.19	.66**	.36**	.71**
AX/Out	.02	.22	-.16	.64**	-.27	.43**	.19
AX/Con	.13	.14	.66**	-.39**	.96**	-.32*	.32*
AX/EX	.17	.45**	.41**	.48**	-.25	.87**	.58**
Anger	.66**	.75**	.76**	.16	.41**	.52**	.94**

Table 4
Cronbach alpha coefficients of subscales of English and Urdu versions of STAXI (N = 48)

Subscales	No of items	Alpha coefficients of STAXI subscales		Between-Group
		English	Urdu	
SA	10	.95	.94	.94
TA	10	.77	.70	.86
AX/In	8	.86	.87	.95
AX/Out	8	.61	.66	.78
AX/Con	8	.76	.81	.95
Anger Total	44	.94	.93	.96

Study 2: Factor Structure of Urdu version of STAXI

METHOD

Participants

The sample of the present study (N =287, outdoor hypertensive patients = 163, non-hypertensive= 124) was taken from outdoor departments of 3 public hospitals. Inclusion criteria for hypertensive patients was settled as (1) age ranged between 35 to 65 years, (2) who were diagnosed as hypertensive patients and had been currently taking medicines for hypertension, (3) who were able to read and write Urdu language, and (4) participants who were willing to participate in the study. Non hypertensive group was also taken from outdoor departments of public hospitals and they were non blood relatives or visitors of hospitals. They also fulfilled the above mentioned criteria except no. (2).

The age range of the study participants was from 30 to 60 years (*M*= 43; *SD* = 8.24). The range of their number of dependents was from 0 to 11. Their monthly expenditures ranged from Rs.15000 to Rs.85000 per month (*M*= 32066; *SD* = 17753.21) and weight from 63 to 98 kg (*M*= 73; *SD* = 8.02). Their working

hours ranged from 4 to 16 hours (*M*= 8.80; *SD* = 4.08). Other characteristics are given below in Table 1.

Table 5
Demographic characteristic of the study participants (N = 287)

Demographic Variables	Hypertensive patients (*n* = 163)		Non-hypertensive (*n* =124)	
	f	*%*	*f*	*%*
Gender				
Males	92	56	60	49
Females	60	43	64	51
Education				
Uneducated	14	10	8	6
F. A/ F. Sc	70	43	38	30
M. A/ M. Sc	56	34	67	54
M Phil	36	26	11	8
Occupation				
No Job	63	39	52	42
Job	70	43	47	38
Business	22	14	21	17
Job & business	8	5	4	3
New in city				
No	55	33	94	80
Yes	109	67	34	20
Family history of hypertension				
No	19	6	68	55
Yes	145	89	56	39
Spouse job				
No	80	50	60	49
Yes	84	43	64	52
Family System				
Joint	29	18	29	23
Nuclear	29	18	95	77

Procedure

STAXI and demographic information form were administered to the participants after taking permission from hospital administration and informed consent from the participants.

RESULTS

The 44 items of the Urdu STAXI were factor analyzed and principal component solutions were obtained to explore the underlying factor structure. A principal component analysis yielded 7 factors with Eigen values greater than 1.0. KMO yielded the value of .940 signify sufficient sample size for conducting factor analysis. Bartlett's test of Sphericity remained statistically significant indicating that variables were adequately correlated and supporting the factorability of the correlation matrix.

Table 6
Eigen values and percentages of variances explained by five factor in the factor solution obtained through principal components analysis (N =287)

Factors	Eigen Values	% of Variance	Cumulative %
AX/ C	6.427	14.606	14.606
TAS	5.474	12.440	27.046
AX/IN	5.126	11.649	38.695
SAS	4.699	10.680	49.375
AX/OUT	3.922	8.913	58.287
SANGF	2.223	5.053	63.340
TANGT	1.479	3.361	66.70

Note: AX/C (Anger control), TAS (Trait anger scale), AX/In (Anger-in), SAS (State anger scale), AX/Out (Anger-out), SANGF (State Anger Feeling), TANGT (Trait Anger Temperament).

As can be seen Eigen values shown in Table 7 indicate that the five factors accounted for 58.28 percent of variance. Table 5 shows that factor 1 explained 14.60 percent of variance, Factor 2, 3, 4, 5 and 6 accounted for 27.04, 38.69, 49.37, 58.28 and 63.34 percent of the variance respectively. Overall, the

six factors accounted for 63.34 percent of the total item variance. Factor 7 has Eigen value1.47 and accounted for 66.70 percent of the total item variance.

Further, the principal component analysis with Varimax rotation conducted on the 44 items STAXI in Urdu language yielded a 7 factor solution. These 7 factors were carefully analyzed with respect of their content and underlying subject matter of items in the light of State Trait Theory of Personality. A total of 9 items loaded on the first factor and this has items related to Anger-Control (AX/Con). This factor was labeled as (AX/Con). Nine items loading on second factor exhibit the Trait Anger Scale (TAS). The persons with this subtype of anger show anger as a permanent feature of their personality. The third factor (AX/In) comprised of 7 items. These items were related to internalizing anger. The individual with AX/IN has the tendency to suppress anger. The 4th factor consisted of 7 items (SAS) State Anger Scale characterized by provoked due to current unpleasant situation. SAS is a simple anger feeling and an anger experience combined with an action tendency. The 5th factor composed of eight items presents (AX/Out). Anger-out is a subtype of anger displayed in the forms of outbursts of anger outwardly. The 6th factor is a part of the original SAS and consists of three items of angry feeling (SANGF). Lastly the 7th factor has only one item of (TANG) Trait Anger Temperament.

Table 7
Factor Loadings of the 44 Items STAXI in Urdu Language on First seven Factors in the Factor Solution Obtained Through Varimax Rotation (N = 287)

			Factors						Items- Total Scale
Sr. No.	Item no	1 AX/C	II TAS	III AX/IN	IV SAS	V AX/O	VI SANGF	VII TANGT	r
1	23	.757							.560**
2	35	.755							.683**
3	31	.747							.687**
4	21	.742							.699**
5	24	.727							.633**
6	40	.697							.375**
7	28	.690							.499**
8	44	.591							.654**
9	38	.553							.528**
									Contd……

				Factors				Items- Total	
Sr. No.	Item no	1 AX/C	II TAS	III AX/IN	IV SAS	V AX/O	VI SANGF	VII TANGT	r
10	12		.808						.437**
11	11		.806						.699**
12	16		.704						.721**
13	13		.643						.640**
14	19		.593						.767**
15	17		.556						.689**
16	20		.523						.767**
17	15		.495						.656**
18	14		.493						.557**
19	33			.726					.744**
20	36			.721					.715**
21	41			.689					.522**
22	26			.602					.250**
23	37			.591					.534**
24	30			.590					.481**
25	25			.433					.641**
26	5				.778				.721**
27	8				.769				.323**
28	7				.736				.548**
29	9				.689				.230**
30	4				.633				.715**
31	10				.514				.483**
32	6				.483				.266**
33	42					.735			.675**
34	39					.713			.344**
35	27					.695			.521**
36	43					.672			.672**
37	34					.614			.710**
38	29					.584			.674**
39	32					.575			.285**
40	22					.553			.542**
41	1						.689		.720**
42	2						.600		.330**
43	3						.554		.235**
44	18							.527	.191**

Note: Only loadings above .3 are displayed

It is worth mentioning that some of the items of the STAXI loaded at .30 and above on 2 or 3 factors were included in their original factors because they were more appropriate in these factors when their content was deeply studied. It was supposed that such items fall in other factors due to their similarity of content material should be included into the original factors. Original STAXI has 5 subscales named SA (State anger), TA (Trait anger), AX/In (Anger-in), AX/Out (Anger-out), AX/Con (Anger-control). In the present study, items no I, 2 and 3 composed sixth factor of state anger feeling (SANGF). Original STAXI has SA with two subscales of state anger feeling (SANGF) and feel like expressing anger physically (SANGP). So, items no. 1, 2 and 3 were incorporated in the SA to preserve the originality of the factor. 7th factor comprised of only one item no. 18 which is originally a part of TA. So, item no. 18 was included in TAS. Item no. 23 loaded on factor 1 (AX/Con) rather than its original factor (AX/In). Factors loading indicate that item no. 23 has high loading on (AX/Con). Conversely, (AX/Con) and (AX/In) are grouped as (AX/Expression) and with the inclusion of (AX/OUT) they form index of (AX/Expression). Rest of the items loaded in their original factors. In STAXI Urdu all of the factor loadings are according to their original factors Spielberger (1988).

Table 8
Logistic Regression Analysis to Explore the Subscales of STAXI as Predictors of Hypertension (N = 287)

Variable	*B*	*S.E*	LL	*OR*	UL
				CI 95%	
Constant	-9.25	1.64			
State anger	.07***	.018	1.04	1.08	1.12
Trait anger	.18**	.06	1.06	1.20	1.35
Anger-in	.02**	.08	1.05	1.09	1.15
Anger-out	-.34	.07	.60	.70	.82
Anger-control	.06***	.047	.97	1.06	1.16
Anger	.09***	.017	1.05	1.09	1.13

Note: R^2 = 47.58 (Hosmer & Lemeshow), .58 (Cox & Snell), .78 (Negelkerke). Model χ^2 (21) = 31.60, OR = Odds ratio, LL - Lower Limit; UL-Upper Limit **$p<.01$,***$p<.001$.

Logistic regression analysis was run to examine STAXI subscales as predictors of hypertension. The findings from Table 7 indicate that STAXI is

successfully predicting hypertension. The coefficient for state anger is .07 and odds ratio is 1.08. The coefficient is positive, so when the state anger increases by one scale unit, chances of hypertension in a person would increase 1.08 times. The coefficient for trait anger is .18 and odds ratio is 1.20 which indicates that as trait anger would increase by one scale unit the odds of hypertension in an individual would increase 1.20 times. The values ($B = .02$, $OR = 1.09$) shows that as anger-in will increase by one scale unit the likelihood of being suffering from hypertension in a person would increase by 1.09 times. Next, the anger-out remained insignificant in predicting hypertension. Finally the values of anger-control indicate that odds ratio 1.06 and coefficient = .06. The coefficient is positive and each scale unit increase in scores of anger-control is associated with increase in hypertension by a factor of .06 (95% CI .97-1.16, $p < .001$), and the coefficient for total anger is .09 and odds ratio is 1.09. The coefficient is positive and each scale unit increase in scores of total anger is associated with increase in hypertension by a factor of .09 (95% CI 1.05-1.13, $p < .001$).

Construct Validity of the Adapted Scale by Method of Contrasted Groups

Construct validity estimates the ability of an instrument to measure the underlying construct of interest (Ellenbecker & Byleckie, 2005). Method of contrasted groups was used to ensure the construct validity of the scale as recommended by Nadeem and Aftab (2012).

Table 7
Difference of scores of hypertensive and non-hypertensive (cases control) groups on subscales of STAXI Urdu (N =287)

Variables	Hypertensive (163)		Controls (n=124)		t	Cohen's d	95% C.I	
	M	SD	M	SD			LL	UL
SA	17.54	6.50	12.16	4.02	8.66**	.99	4.16	6.60
TA	23.78	8.20	17.02	7.71	7.44**	.84	4.96	8.54
AX/IN Urdu	19.73	7.21	12.08	5.51	10.42***	1.19	6.21	9.10
AX/OUT Urdu	13.64	4.77	16.27	5.27	-4.58*	.51	-3.75	-1.49
AX/CON Urdu	22.54	6.63	15.50	8.56	8.06**	.91	5.32	8.75
AX/EXP Urdu	26.83	7.25	27.84	9.87	-2.04	.11	-3.93	-.77
Anger Total	124.09	29.56	99.89	24.64	7.13**	.88	16.08	28.32

Note: *Cl* - Confidence Interval*; LL* - Lower Limit; *UL*-Upper Limit, *$p < .05$, **$p < .01$, ***$p < .001$

The results given Table 7 indicate significant difference in state anger, trait anger, anger-in, anger-out, anger-control and anger between both groups. The values of Cohen's *d* indicate that state anger, trait anger, anger-in, anger-out, anger-control and anger have larger effect on people with hypertension as compared to non hypertensive group which ensures the construct validity of the scale.

Table 8

Prevalence of Anger among Hypertensive Males and Females Using Urdu STAXI (N = 287)

Subscales		Hypertensive	Males (*n* = 92)	Hypertensive	Females (*n* = 71)
		f	*%*	*f*	*%*
SAS	Low	39	42.4	66	93
	Medium	46	50	5	7
	High	7	7.6	-	-
TAS					
	Low	11	12	41	57.7
	Medium	40	43.5	28	39.4
	High	41	44.6	2	2.8
A/IN					
	Low	7	7.6	26	36.6
	Medium	15	16.3	36	50.7
	High	70	76.1	9	12.7
A/OUT					
	Low	59	64.1	59	83.1
	Medium	28	30.4	11	15.5
	High	5	5.4	1	1.4
A/CON					
	Low	2	2.2	19	26.8
	Medium	10	10.9	33	46.5
	High	80	87	19	26.8
Anger					
	Low	11	12	2	2.8
	Medium	81	88	50	70.4
	High			19	26.8

Note: f = frequencies, *%* = percentages

The findings in Table 8 show gender-wise prevalence rate of anger among hypertensive males and females on SAS, TAS, A/IN, A/OUT, /CON, and anger. We divided all subscales into ordinal scales from low to high degrees of sensitivity and the findings indicate that anger frequencies and percentages are more prevalent in hypertensive males than in hypertensive females. Previous finding have also shown that hypertensive males pass through more anger than hypertensive females (Matthews, Woodall, & Allen, 1993).

DISCUSSION

There is paucity of researches in the area of health and quality of life in Pakistan. As a result, there is a dire need of accessibility of passable measurement tests in Urdu to find out level of anger and its consequences upon health in the form of diseases like hypertension and coronary heart disease. The present study aimed to extend the already existing research on STAXI which assessed the reliabilities and construct validity in a clinical sample. Results from the present study indicated that the five factors is more appropriate accounted for 58.28 percent of the variance. The developed Urdu scale of STAXI will help health practitioners and clinical psychologists to assess the contribution of anger in different medical conditions. The developed scale can also help researchers to use this scale in different areas for the accurate assessment of anger.

Initially we found correlations among subscales of Urdu and English versions. The main finding of the current research is that State Anger has significant positive correlation with Trait Anger and Anger. The current research finding is consistent with a group of researchers (Eckhardt et al., 2004) who found significant correlation between State Anger and Trait Anger. Next main finding is that Trait Anger is significantly correlated with AX/In, AX/EX and Anger. The findings are consistent with previous literature on anger increase (Borteyrou et al., 2008) who concluded the same results. Further, AX/OUT has significant positive correlation with AX/EX, but negative correlation with AX/Con. This may be explained that people with tendency to turn anger outside cannot control their angry temperament. Analysis also reveals that AX/Con is positively correlated with AX/IN but negatively correlated with AX/EX. Similarly AX/EX is positively correlated with AX/IN and AX/out. This finding is consistent with those of a research (Steele, Legerski, Nelson, & Phipps, 2009) where the same results have been reported.

A significant correlation was found within the Factors of STAXI and correlations ranged from $r = .46$ between AX-IN and TA to $r = .76$ between Anger and AX-IN. The highest correlation between Anger and AX-IN shows that the person who experience anger, is likely to internalize it, rather express it in the environment. Environment may have taught the person not to express anger in front of others or superior to him/her but internalize it which is very dangerous with the health perspective.

The internal consistency of the 44 items on the adapted Urdu version of STAXI yielded reliability coefficients of .94. Alternate Form Reliability of the scale was established through counter-balance method of research. Alpha Coefficients were calculated for all subscales of Urdu and English Forms. Cronbach Alpha can determine reliability based on average correlation among items and it is commonly used for the purpose of test adaptation and translation (McNemar, 1969). Alpha Coefficients of the Urdu Form ranged from .66 for AX/Out to .94 SA and for English Form ranged from .61 for AX/Out to .95 for State Anger subscales. Results indicate the reliability of Urdu STAXI. There is sufficient empirical evidence which suggests that STAXI is a reliable tool for assessing anger (Eckhardt et al., 2004; del Barrio, Aluja, & Spielberger, 2004; Reyes, Meininger, Chan, & Mueller, 2003). The high reliability coefficients for the adapted STAXI in the present research suggest that all the subscales are constant and reliable as substantiated by a recent study (Bishop & Quah, 1998).

Factor analysis of STAXI yielded 5 factors of SA, TA, AX/In, AX/Out and AX/Con. According to Spielberger (1995), State Anger Scale assesses the emotional condition related to present angry feelings that array from mild irritation to intense fury due to emotional state of ANS. TA is a dispositional feature of personality and measures the rate and personal experiences of anger in response to different environmental conditions. AX/In assesses the inclination of repressing angry thoughts and feelings. AX/OUT measures the tendency to transmit anger externally to persons or things by displaying aggressive physical or oral behavior. AX/Con assesses the propensity of effectively reducing anger incidence (Eckhardt et al., 2004). Many other scales have performed factor analysis with STAXI and have placed item no.18 in Trait Anger Scale, but in the current study item no. 18 formed a separate factor. The said item was included to its original factor TANG due to the similarity of content keeping in view that there should be minimum three items to constitute a factor (Kim & Mueller, 1978). The current findings are in line with researches (Borteyrou et al., 2008;

Haseth, 1996; Kassinove et al., 1997; Van Der Ploeg et al., 1988) who adapted STAXI into their indigenous languages and found the same factor structure.

Furthermore, construct validity of STAXI was established through contrasted groups as recommended by contemporary researchers (Nadeem & Khalid, 2012). Hypertensive patients scored significantly greater than non-hypertensive control group on SA, TA, AX/In, AX/Out, AX/Con, and an index of AX/Expression and overall Anger. There is a well-built theoretical rationale to confirm that group variation comes out in STAXI (Pickering, 2007).

Overall findings of the present research are consistent with those of Kassinove et al. (1997) who found sufficient alpha coefficients on all subscales of the Russian version and Krisztina, Maria and Ake (2003) who found sufficient alpha coefficients for the Swedish scale and finally with del Barrio et al. (2004) who attained high reliability alpha coefficients for the Spanish version of STAXI.

The current study revealed Anger (STAXI) as an emotion with many components. The subscales have been found to correlate with the total Anger scale (ranging from $r = .31$ for AX-In to $r = .76$ for Trait Anger). This brings about that each component contributes its specific variance and all subscales are independent from one another and from other similar constructs of hostility and aggression.

The present study is a pioneering step in the adaptation of an indigenous anger scale which can be used for the assessment of anger across different dimensions. Results of the studies can be of great help in clinical use, as a basic source of reference and can also be useful for cross cultural comparisons on basic emotion of anger. Anger with its different dimensions can be used for the assessment of many diseases. For example there is extensive evidence that anger suppression is a major predictor hypertension and coronary heart disease. Similarly other dimensions of anger in Urdu can effectively be used to predict many other diseases like renal failure, diabetes etc. The investigation of psychological factors of hypertension is another important area of the present research. The early identification of psychological risk factors of hypertension in America has yielded some promising results in treating it.

Limitations

Main limitation of the current research is that it was a carried out with a small sample taken from 3 public hospitals only, which may be not be thought out true representative of the whole hypertensive population. It may be a threat to generalization of the current research. Further effort is needed to explore the risk factors of hypertension with a large sample to bring more wide-ranging conclusions. Norms have not been developed which limit its use among different populations.

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