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Original Article

Development and validation of a Thai stressful life events rating scale for patients with a diagnosis of schizophrenic methamphetamine abuse

Ek-uma Imkome[1]*, Jintana Yunibhand[2], and Waraporn Chaiyawat[2]

[1] *Faculty of Nursing, Thammasat University, Khlong Luang, Pathum Thani, 12120 Thailand*

[2] *Faculty of Nursing, Chulalongkorn University, Pathum Wan, Bangkok, 10330 Thailand*

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Abstract

This study aimed to psychometrically test a Thai Stressful Life Events Rating Scale (TSLERS). Factor analysis was done on data collected from 313 patients with schizophrenia and methamphetamine abuse in Thailand from April to May, 2015. Results identified the following problems impacting physical and mental health: social relationship and social concerns, money, family life, life security, and career. Evaluation of the psychometric scale properties demonstrated acceptable validity and reliability. TSLERS provided scientific and empirical data about stressful life events of patients with schizophrenia and methamphetamine abuse, and was suitable for stress detection and suggesting further innovations.

Keywords: Thai Stressful Life Events, instrument development, validity, reliability, patients with a diagnosis of schizophrenic methamphetamine abuse

1. Introduction

Stressful life events play an essential role in precipitating mental health problems and psychiatric disorders (Sadock *et al.*, 2015). Since the occurrence of the same life event can yield different meanings in different individuals, subjective appraisal has been identified as a critical part of the effect life events have upon well-being. For example, people generally think that methamphetamine abuse is a stressful experience; however, for patients with schizophrenia who have experienced long-term methamphetamine abuse, abuse can be a resolution of stress and even relief in terms of elevated mood and escape from stressful reality. Stressful life events have a significant direct negative effect on medication use self-efficacy and positive indirect effect on psychotic symptoms among patients with schizophrenia and methamphetamine abuse (Fron *et al.*, 1994; Imkome *et al.*, 2015).

The consequences of life events on physical and psychological well-being depend on individual differences. Stressful life event measurement has become an important way to evaluate patient level of stress and for measuring nursing and treatment outcomes. This scale guides nursing care levels for patients with schizophrenia and methamphetamine abuse.

The stress assessment covered stressor and stress response (Handel, 2003). Stressor as an environmental state is imperative; empirical studies indicate that stress measurement should measure frequency and intensity of stress (Belbeisi *et al.*, 2009). Questionnaires to measure stressful life events have been developed. The stressful life events questionnaire (Roohafza *et al.*, 2011) usefully predicted value, resulting in a weighting of stressors, listing life issues from the most to least stressful. The way stressors are perceived

* Corresponding author.
Email address: ek-uma@nurse.tu.ac.th; yumi_jintana@hotmail.com

and life events experienced varies among individuals and across cultures. Degree of stress perceived for each kind of stressor is the major point. Burden of life event stressors in developed and developing countries differ. In developed countries, workload is the main job stressors, but in developing countries, job insecurity and unemployment are principal job stressors (Hämäläinen *et al.*, 2007). More recent studies have demonstrated sensitivity to negative life events and stress of changes in health statutes in developed countries. Global developments and lifestyle changes in different societies created new stressors. Difficulties with self-reporting stressful life event checklists limited reliability and validity of stress assessments.

A new scale model to measure stress or cover frequency and life event intensity is needed. The present study evaluates psychometric properties of a Thai stressful life event rating scale (TSLERS). It could help health care providers assess stress in patient lives, and measure and prevent psychiatric problems.

2. Materials and Methods

2.1 Design and participants

This cross-sectional study analyzed data from patients with schizophrenia and methamphetamine abuse. Those at eight inpatient units of psychiatric and substance abuse services in Thailand were invited to participate in this study. Using a multi-stage sampling method, participants were recruited in central, northern, north-eastern, and southern Thailand (Regional Data Exchange System [RDES], 2008). Hospitals/institutions included were government and tertiary care hospitals as well as psychiatric and substance abuse services. Three military hospitals, eleven psychiatric hospitals, and seven drug dependence treatment centers provided a random sampling of Thai hospital. Lists of participants were obtained from psychiatrists and psychiatric nurses at selected hospitals. Inpatients were included because stressful community life events have a noteworthy effect on immune systems that ultimately manifest disorders. Participants were selected according to inclusion criteria: (a) between 19 and 60 years old, since adolescents were not part of the population group and aging directly affects cognition and certain diseases; (b) diagnosis of schizophrenia and methamphetamine abuse; (c) a Brief Psychiatric Rating Scale score of under 36; (d) inpatient care; and (e) willingness to participate. Participants were excluded if they had major medical complications such as hypotension, seizure, or tremors; or post-admission physical instability or severe psychiatric symptoms such as delusions and hallucinations. Simple random sampling without replacement was used to choose participants from a list after inclusion criteria had been met.

Sample size: The confidence interval for the Pearson product-moment correlation coefficient was used to calculate sample size (Streiner *et al.*, 2014).

$$Z'(r) = \frac{1}{2}\log_e\frac{(1+r)}{(1-r)}$$

$$CI_H = Z'(r) + Z_{\alpha/2}\frac{1}{(N-3)}$$

$$N = \left[\frac{Z_{\alpha/2}}{Z'(r) - Z'(r + CI_H)}\right]^2 + 3$$

Note: r = correlation coefficient; $CI_{H=}$ half of the confidence interval; N = sample size

N for reliability if α level of 0.05 and CI_H value = 0.10. Therefore, a minimum of 250 participants was needed to achieve reliable testing. Reliability of factor analysis in general over 300 cases is considered adequate to increase study validity (Field, 2013; Hair, 2010; Tabachnick & Field, 2007) and 10% of total sample size was added to take dropouts into account. Finally, three hundred and thirteen participants were recruited.

2.2 Theoretical framework

TSLERS was developed based on concepts of stressful life changes and the assumption that life events have uniform effects measured in life-change units. Influence of stressful life events depends on the nature of the events, whether they are undesirable, unpredictable, or uncontrollable. Stressful life events are also a factor in susceptibility to illness, precipitating mental and somatic disorders (Holmes & Rahe 1967). This concept covers five constructs: (I) personal growth, maturation, and renewal; (2) tension and uncertainty; transitions in personal or occupational situations; (3) changes in one's usual routine and relationship; (4) significant changes in family or marriage; and (5) personal catastrophes.

2.3 Instrument

The Stressful Life Events Questionnaire (SLEQ) (Roohafza *et al.*, 2011) contained 46 items on a 6-point Likert scale (1 = never to 6 = very severe) for each of the domains of home life, financial problems, social relations, personal conicts, job conicts, educational concerns, job security, loss and separation, sexual life, daily life, and health concerns. Ratings were based on patient behavior during the previous month.

SLEQ aggregated total life events to generate an overall score by aggregating all life events experienced within a given time frame in the past. Likewise, SLEQ showed a correlation coefficient was moderately significant among constructs of scale and between the SLE questionnaire and GHQ-12 score. Discriminant validity analysis results were promising. Overall, the psychometric properties of this questionnaire were acceptable. Therefore, SLEQ should be developed for the Thai population.

SLEQ was back-translated into Thai language (Brislin, 1970). It was first translated into Thai language by two Thai instructors and then back-translated into English by two native Thai freelance translators. The back-translated English version was compared with original for consistency in meaning by two instructors, with accuracy verified by a panel of experts.

2.4 Psychometrics properties testing

Content validity was assessed by a panel seven experts included two psychiatrists, three nursing instructors, one psychologist, and one advanced practice psychiatric nurse. Panel experts were asked to rate on a 4-point Likert scale items not relevant that should be deleted; somewhat relevant and requiring substantial revision; quite relevant to be slightly revised; highly relevant and not requiring change.

Reliability was conducted with a corrected item-to-total correlation coefficient, inter-item correlation matrix, and alpha estimate, if the item was deleted from the scale. We used exploratory factor analysis (EFA) to find factors representing variables. We tested TSLERS for internal consistency and calculated Cronbach's alpha for each subscale.

Factor analysis was used in the form

$$Yij = \mu j + \sum_{k=1}^{p} \gamma^{(k)} \lambda j^{(k)} fi^{(k)}$$

with yij as the outcome in row i and column j of the r× c matrix data array. Where μj is the mean of variable in columns, the p column vectors $f^{(k)}$ in this model are called common factors and the p row vectors $\lambda^{(k)}$ are called loadings. Maximum likelihood was used to account for correlations between the set of outcome variables in the data matrix and extraction of appropriate numbers of factors (Costello & Osborne, 2005). Exploratory factor analysis (EFA) was performed, using principal component analysis (PCA) with varimax rotation. For factor extraction, parallel analysis (PA) with Kaiser's eigenvalue-greater-than-one rule and the Scree test were used. We used PA with 1,000 random data sets and 95th percentile of eigenvalues. PA with Monte Carlo simulations (PAMC) was used to confirm the number of factors to be extracted by comparing the 95th percentile values of eigenvalues computed from PAMC with those obtained from EFA. Reliability and combined use measures for internal consistency were evaluated. Responses were analyzed for each item. Confirmatory factor analysis (CFA) for validity assessment was conducted using analysis of moment structure (AMOS), version 22.

2.5 Ethical considerations

On March 18, 2015, approval was obtained from the Ethics Review Committee for Research Involving Human Research Subjects, The Health Science Group, Chulalongkorn University (COA. No. 053/ 2558). Prospective samples were told of the purpose and methods of the study, and that they were not obliged to participate. Also, they could withdraw at any time. Written informed consent was obtained from each study participant before data collection. Participants were assured of confidentiality and anonymity.

2.6 Data collection

Three hundred and thirteen participants were asked to complete the questionnaire and the data were collected from April to May, 2015. Residents from eight study sites meeting the study criteria were recruited as potential participants.

2.7 Statistical analysis

Descriptive statistics, linear correlation analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett test of sphericity were used to establish adequacy of item correlation matrix, upon which factor analysis was conducted. SPSS Statistics, a software package used for statistical analysis, version 22.0 (IBM, NY, USA) was employed.

3. Results

3.1 Demographic characteristics

The mean age of 313 schizophrenic methamphetamine abuse patients was 31.45 years (SD = 7.83, range = 19 to 58). The majority (87.9%) was male; more than half (66.1%) were single and 55.0% were high school graduates. Only 28.4% were employed.

3.2 Preliminary analysis

Analysis showed that corrected item-total correlation of item ranged from .29 - .81. We retained all items to confirm factor loading value to determine the drop of that item.

3.3 Validity

Validity: Stressful life events are not uniform across populations. We revised some items to relevant and representative life events for Thai target populations. More importantly, we were concerned about an exposure to life events varying in terms of gender and social roles. Confounding life events is a particularly vital issue in measuring them. Many items in life event inventories are closely related to well-being, such as illness, injury, hospitalization. These may be easily confounded with physical and mental health outcomes. Health-related life events were duly separated from non-health-related items.

Content validity of scale items was assessed by seven experts; CVI was 1.00. We determined sampling adequacy for factor analysis using Bartlett's chi-square test of sphericity (11316.195, df = 703, $p<0.001$) and the KMO measurement (0.961).

3.4 Reliability

Cronbach's alpha values for overall scale and sub-scales were high: .97 for overall, .95 for factor 1, .96 for factor 2, .88 for factor 3, .85 for factor 4, .88 for factor 5, and .88 for factor 6. Analysis showed that Corrected Item-Total Correlation ranged from .3 to .92, and test retest was acceptable ($r = .72$, $p < .01$).

3.5 Factor analysis

After the initial EFA for the 46 items, we retrieved 6 factors with extraction by principal component analysis. Rotation method was Varimax with Kaiser normalization with eigenvalues greater than 1.0. The Scree plot showed that six factors could be interpreted as just above the elbow of the curve (Figure 1). The PA revealed that eigenvalues of six factors were greater than the 95th percentile in distribution of eigenvalues derived from random data (Table 1). PAMC confirmed the six factors with extraction as shown on the scree plots of TSLERS by Monte Carlo simulations (Table 2, Figure 2). We dropped item 34 with cross-loading above 0.32. All 45 items met the criterion of a factor loading of 0.5 and together accounted for 86% of total variance. KMO measurement of sampling adequacy of chi-square 13309.37, df. = 1305, sig = 0.000<0.05 which accepted and KMO and Bartlett's Test index of 0.958 greater than 0.05 and close to 1.0. This initial result represented good factor analysis. Results were that TSLERS revealed six components and all factors loading over 0.50 (Table 3).

The theoretical framework of six latent variables was chosen, including the impact of physical and mental health (Impact PM), and problems with social relationships (S_RC), money (EC), family life (FLP), life security (SLP) and career (CP). The six-factor model was tested first. This model of a 46-item scale did not fit (X^2 = 386.413; $p < 0.001$; X^2/df = 5.08; TLI = 0.84; CFI = 0.89; and RMSEA = 0.11). To advance the model, we dropped item number 34 which had a low load-

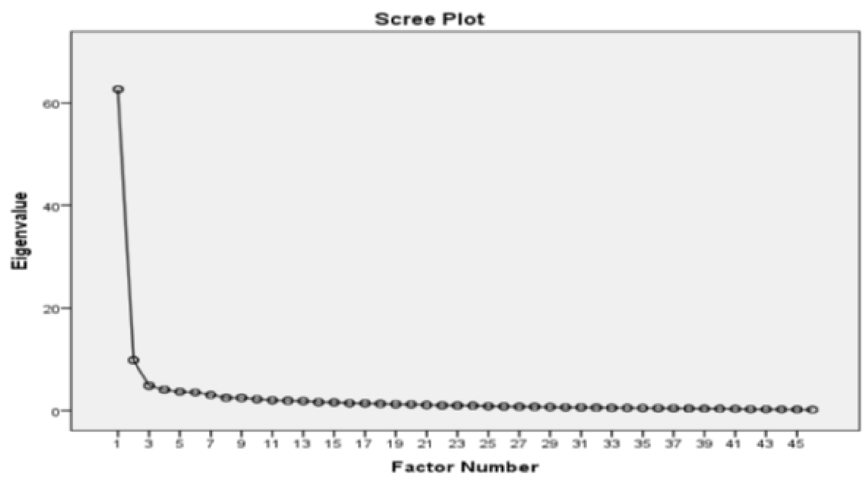

Figure 1. the scree plot of TSLERS by EFA

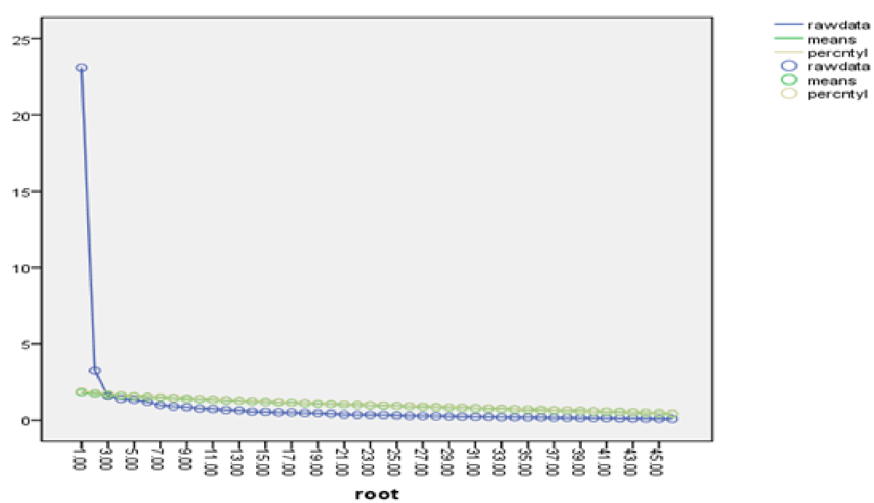

Figure 2. Scree plots of TSLERS by Monte Carlo Stimulations

Table 1. Factor analysis the factor of the Thai stressful life events rating scale.

Variable	Factor loading					
	(1) The impact of physical and mental health concern	(2) Social relationship and social concern	(3) Economic problem	(4) Family life problem	(5) Security life problem	(6) Career problem
SLE1	0.002	0.013	0.020	0.726	0.097	0.029
SLE2	0.272	0.348	0.228	0.551	0.007	0.066
SLE3	0.055	0.057	0.085	0.809	0.118	0.050
SLE4	0.119	0.234	0.282	0.656	0.168	0.043
SLE5	0.162	0.081	0.213	0.711	0.243	0.076
SLE6	0.269	0.149	0.382	0.560	0.136	0.124
SLE7	0.268	0.374	0.493	0.341	0.003	0.102
SLE8	0.203	0.249	0.711	0.249	0.210	0.125
SLE9	0.173	0.110	0.746	0.281	0.222	0.224
SLE10	0.173	0.115	0.692	0.238	0.192	0.268
SLE11	0.308	0.390	0.618	0.134	0.181	0.076
SLE12	0.355	0.540	0.478	0.133	0.210	-0.035
SLE13	0.395	0.547	0.432	0.099	0.380	-0.036
SLE14	0.409	0.487	0.388	0.157	0.354	-0.037
SLE15	0.461	0.447	0.317	0.094	0.415	0.013
SLE16	0.303	0.163	0.208	0.190	0.661	0.178
SLE17	0.239	0.356	0.178	0.309	0.483	0.201
SLE18	0.490	0.598	0.165	0.175	0.250	0.177
SLE19	0.157	0.375	0.215	0.277	0.575	0.166
SLE20	0.240	0.213	0.228	0.378	0.619	0.203
SLE21	0.096	0.142	0.180	0.401	0.642	0.245
SLE22	0.125	0.519	0.118	0.412	0.290	0.229
SLE23	0.279	0.682	0.209	0.204	0.260	0.169
SLE24	0.403	0.725	0.171	0.112	0.178	0.176
SLE25	0.350	0.679	0.097	0.178	0.249	0.272
SLE26	0.416	0.708	0.121	0.170	0.187	0.163
SLE27	0.437	0.700	0.185	0.109	0.138	0.134
SLE28	0.399	0.661	0.206	0.044	0.143	0.217
SLE29	0.304	0.569	0.295	0.181	0.060	0.245
SLE30	0.374	0.397	0.195	0.152	0.096	0.631
SLE31	0.304	0.211	0.176	0.115	0.206	0.742
SLE32	0.183	0.239	0.180	0.068	0.379	0.719
SLE33	0.382	0.500	0.182	0.067	0.403	0.282
SLE34	0.290	0.219	0.372	0.222	0.217	0.411
SLE35	0.748	0.131	0.187	0.189	0.198	0.090
SLE36	0.686	0.195	0.217	0.136	0.242	0.053
SLE37	0.763	0.159	0.130	0.207	0.168	0.094
SLE38	0.689	0.386	0.151	0.143	0.187	0.204
SLE39	0.738	0.326	0.185	0.118	0.014	0.235
SLE40	0.748	0.346	0.176	0.168	0.013	0.221
SLE41	0.678	0.428	0.202	0.120	0.021	0.231
SLE42	0.673	0.484	0.162	0.135	0.042	0.230
SLE43	0.664	0.414	0.077	0.082	0.231	0.124
SLE44	0.517	0.361	0.135	0.051	0.457	0.129
SLE45	0.572	0.308	0.242	-0.021	0.323	0.244
SLE46	0.645	0.333	0.166	0.003	0.287	0.080
Initial Eigenvalues	(8.64)	(7.74)	(4.31)	(4.30)	(3.98)	(2.84)
Rotation Sums of Squared Loadings of Variance (%)	(16.83%)	(16.83%)	(9.36%)	(9.35%)	(8.64%)	(6.18%)

Bartlett's Test of Sphericity
KMO and Bartlett's Test = 0.958 Chi-Square = 13309.37 df. = 1305 sig. = 0.000
Sum of initial eigenvalues 31.81 / Sun of Eigenvalues = 69.16%

Table 2. Raw Data Eigenvalues, Mean, Percentile Random Data Eigenvalues of TSDRS by Monte Carlo Stimulations (n = 313)

Items	Root	Raw Data	Means	Percentile	Items	Root	Raw Data	Means	Percentile
SLE1.	.000000	23.092879	1.827275	1.921317	SLE24	.000000	.334845	.941078	.968306
SLE 2	.000000	3.242920	1.735024	1.800163	SLE25	.000000	.302440	.916200	.941273
SLE3	.000000	1.585955	1.670326	1.729769	SLE26	.000000	.280416	.891838	.917698
SLE4	.000000	1.377828	1.612822	1.663872	SLE27	.000000	.272452	.867764	.891454
SLE5	.000000	1.323431	1.563226	1.611629	SLE28	.000000	.266529	.843157	.867381
SLE6	.000000	1.188713	1.516399	1.557180	SLE29	.000000	.247549	.819391	.844038
SLE7	.000000	.969990	1.472991	1.510978	SLE30	.000000	.236741	.796305	.819620
SLE8	.000000	.887666	1.431676	1.471651	SLE31	.000000	.224167	.772903	.795904
SLE9	.000000	.837759	1.392823	1.427575	SLE32	.000000	.219386	.749722	.772632
SLE10	.000000	.749988	1.355789	1.388974	SLE33	.000000	.189611	.727096	.750555
SLE11	.000000	.714991	1.320086	1.351769	SLE34	.000000	.183697	.704185	.727449
SLE12	.000000	.654630	1.286075	1.319216	SLE35	.000000	.181408	.681853	.706107
SLE13	.000000	.626804	1.253302	1.284046	SLE36	.000000	.175090	.658803	.682500
SLE14	.000000	.546190	1.221558	1.253889	SLE37	.000000	.159292	.636700	.658941
SLE15	.000000	.530725	1.190011	1.221528	SLE38	.000000	.153734	.614215	.636949
SLE16	.000000	.494525	1.159440	1.189316	SLE39	.000000	.144255	.591590	.614904
SLE17	.000000	.489002	1.129294	1.157707	SLE40	.000000	.133395	.568437	.592130
SLE18	.000000	.458943	1.100997	1.128648	SLE41	.000000	.129866	.544997	.569257
SLE19	.000000	.446097	1.072675	1.100805	SLE42	.000000	.110368	.521092	.545313
SLE20	.000000	.416812	1.045383	1.073626	SLE43	.000000	.105472	.496561	.521800
SLE21	.000000	.365252	1.018744	1.045955	SLE44	.000000	.092090	.470592	.496072
SLE22	.000000	.350688	.992646	1.018739	SLE45	.000000	.082422	.442566	.470489
SLE23	.000000	.348382	.966471	.991791	SLE46	.000000	.074603	.407921	.440332

ing. The final model of multi-factor confirmatory analysis found acceptable threshold levels consistent with the concept (Hair *et al.*, 2010). With chi-square = 700.912, df = 642, sig. = 0.053 > 0.05, CMIN/df. = 1.092 < 5.0, results of CFA showed that the model of the TSLERS offered a reasonable fit to the six index data model based on a number of statistics. These included:

(a) Comparative fit index (CFI) = 0.995>0.90 results were consistent with Hair *et al.* (2010), that a good comparative fit index should be over 0.90. A value of CFI over 0.95 is recognized as indicating a good fit (Hair, 2010);

(b) Root mean square error of approximation (RMSEA) means avoiding issues of sample size by analyzing discrepancies between a hypothesized model, with optimally chosen parameter estimates, and population covariance matrix (Hooper, D., Coughlan, J., & Mullen, M.R., 2008). Results found that RMSEA = 0.017<0.08 with acceptable threshold levels consistent with Hair *et al.* (2010), indicating an acceptable model fit;

4. Discussion

Stressful life events showed different perceived stress and intensity among six subscales. Items 34 with redundancy, low discrimination function, and primary factor loadings below 0.40 were removed through item analysis to develop a simple, reliable scale (Brown, 2006). Reliability tests found an overall Cronbach's alpha of 0.93 and values of subscales ranging from 0.85 to 0.95, or good reliability (DeVellis, 2012).

Preliminary analysis showed that the correlation coefficient ranged from 0.34 to 0.73. The Pearson correlation coefficient indicating significance value for each correlation and determinant of this matrix was better than .00001. Thus, multicollinearity was excluded. The KMO measure of sampling adequacy = 0.92. Values above 0.9 fell into the range of excellent. This strongly suggested that factor analysis was appropriate for the data. Bartlett's measure tested the null hypothesis that the original correlation matrix was an identity matrix with p<0.001, indicating that properties of the correlation matrix justified factor analysis being appropriately done (Field, 2013; Hair, 2010; Tabachnick & Field, 2007).

Many extraction rules and approaches were used in this study, including: Kaiser's criteria, the Scree test, the cumulative percent of variance extracted, and PAMC (Cattell, 1966; Hair 2010; Kaiser, 1960; O'Connor, 2000). The result of analysis showed six factors of TSLERS. Inspecting the Scree plot and eigenvalues produced a departure from linearity coinciding with a six-factor result. The analysis of Scree test demonstrated that the data set should be analyzed for six factors (Figure 1, Figure 2).

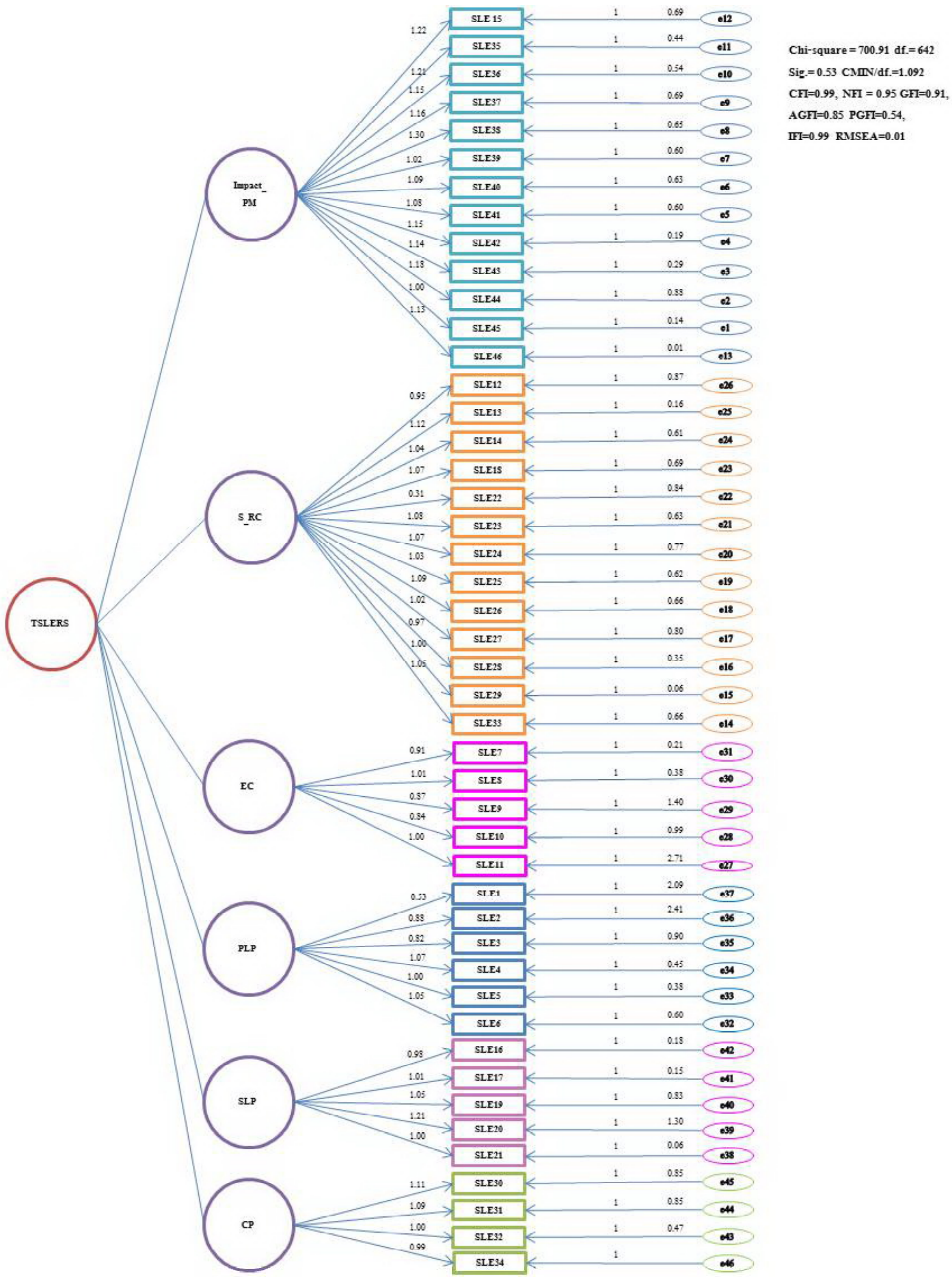

Figure 3. Confirmatory factor analysis (CFA) the model of the Thai stressful life events rating scale

Overall, content analysis seemed to provide adequate theoretical backing for factor models derived from EFA, a statistical method extracting a small number of theoretical and meaningful latent variables from a large group of items. The most important step in EFA was determining the number of factors (DeVellis, 2012). Costello and Osborne (2005) described EFA as a complex process with few absolute criteria and multiple options. It allows researchers flexibility in factor choice. We used PA in addition to eigenvalue rule and the Scree test to avoid subjective interpretation in this important

Table 3. Analysis of confirmatory factor analysis (CFA) the model of the Thai stressful life events rating scale

Variable	Standardized factor loading	Error Variances	t..	P	AVE	CR
The impact of physical and mental health concern					0.601	0.991
SLE45	0.750					
SLE44	0.739	0.07	16.28	0.000**		
SLE43	0.802	0.07	15.723	0.000**		
SLE42	0.863	0.07	16.528	0.000**		
SLE41	0.819	0.07	15.29	0.000**		
SLE40	0.830	0.07	15.598	0.000**		
SLE39	0.801	0.07	15.003	0.000**		
SLE38	0.855	0.08	16.054	0.000**		
SLE37	0.701	0.09	12.791	0.000**		
SLE36	0.721	0.09	12.739	0.000**		
SLE35	0.698	0.09	12.801	0.000**		
SLE15	0.758	0.09	14.213	0.000**		
SLE46	0.744	0.06	18.814	0.000**		
Social relationship and social concern (S_RC)					0.626	0.992
SLE29	0.719					
SLE28	0.791	0.06	15.943	0.000**		
SLE27	0.834	0.07	14.612	0.000**		
SLE26	0.856	0.08	14.537	0.000**		
SLE25	0.816	0.08	13.616	0.000**		
SLE24	0.870	0.07	14.641	0.000**		
SLE23	0.795	0.07	13.72	0.000**		
SLE22	0.644	0.08	11.344	0.000**		
SLE18	0.855	0.07	15.007	0.000**		
SLE14	0.758	0.08	12.535	0.000**		
SLE13	0.808	0.09	13.228	0.000**		
SLE12	0.749	0.08	12.669	0.000**		
SLE33	0.788	0.08	12.95	0.000**		
Economic problem (EC)				0.536	0.832	
SLE11	0.803					
SLE10	0.686	0.07	12.933	0.000**		
SLE9	0.705	0.07	13.304	0.000**		
SLE8	0.774	0.07	14.833	0.000**		
SLE7	0.686	0.07	12.909	0.000**		
Family life problem (FLP)					0.520	0.866
SLE5	0.735					
SLE4	0.713	0.09	12.031	0.000**		
SLE3	0.697	0.08	10.978	0.000**		
SLE2	0.622	0.08	10.436	0.000**		
SLE1	0.790	0.08	6.925	0.000**		
SLE6	0.760	0.08	12.616	0.000**		
Security life problem (SLP)					0.596	0.880
SLE21	0.745					
SLE20	0.860	0.08	15.618	0.000**		
SLE19	0.782	0.07	14.678	0.000**		
SLE17	0.763	0.07	13.71	0.000**		
SLE16	0.702	0.08	12.702	0.000**		
Career problem (CP)					0.882	0.949
SLE32	0.835					
SLE31	0.888	0.07	14.781	0.000**		
SLE30	0.991	0.08	13.734	0.000**		
SLE34	0.906	0.10	10.199	0.000**		

process. We tested the construct validity of TSLERS with EFA. Six factors were extracted, and cumulative contribution was 69.16% of total variance. CFA indicated the best fit of model development based on the theory of stress covers intensity of stress and sensitivity of negative life events.

Analysis produced a six-factor structure accounting for 63.93% of total variance. Each factors identified had high internal consistency as assessed by Cronbach's alpha coefficient. All items had acceptable post-extraction communalities.

Two tests in a two-week period and high internal consistency demonstrated that TSLERS was an instrument of stability. Results found the average variance extracted (AVE) measured variance captured by indicators relative to measurement error. Composite reliability (CR) values for all model constructs were above the threshold value of 0.7. These should be above 0.50 to justify using a construct.

Analyzing CFA in the model of TSLERS, all variables had standardized factor loading ranging from 0.662-0.991 over 0.40. Average variance extracted ranging from 0.520-0.882 over 0.50 and composite reliability ranged from 0.832-0.949 over 0.60. The resulting measure was acceptable value, strongly suggesting that each set of items represented a single underlying construct and providing evidence for discriminate validity or confirming fit. Overall, data indicated an excellent fit for the testing model.

This scale had strength in psychometric scale properties demonstrating acceptable validity and reliability. The format for item responses was appropriate to measure stress in life events and easy to administrate. TSLERS was not used as a screening tool, but an instrument to evaluate the level of stressful life events in six domains among patients with schizophrenia and methamphetamine abuse. Consequently, this instrument was appropriate for assessing psychotic symptoms among persons with schizophrenia and methamphetamine misuse.

5. Conclusions

Caring for patients with schizophrenia and methamphetamine abuse is a challenging area of health care provision as well as research and practice in traditionally homogeneous societies such as Thailand. The assessment of TSLERS may help health care providers, serving as an important basis for developing effective intervention program content. Areas for continuous professional development include analyzing the high frequency construct and designing nursing content for home life, financial problems, social relations, personal conicts, job conicts, educational concerns, job security, loss and separation, sexual life, daily life, and health concerns, boosting the provision of competent care. TSLERS may contribute to effectiveness evaluation of such programs with the goal of improving knowledge and skill of stressful life events management. TSLERS contained 45 items, taking 10 to 15 minutes to complete. Using a 6-point Likert scale, total scores ranged from 46 to 276. Offering practical and sound psychometric properties providing scientific and empirical data for intervention programs developing individual patient stressful life events management skills, it alsomeasures intervention outcomes in the population.

6. Limitations

TSLERS measured participant stressful life events in the previous six months. There may have been more than one situation participants perceived as stressful each day. Or during the six months few or no stressful life events may have been perceived. Participants tended to have periods of remission and recurrence, relating to the question of what situations are severe or not severe. Quantitative measurements of stressful life events at time of occurrence are needed. Sample accuracy of memory was also an issue. Generally, samples reported fewer events for more distant time periods. A retrospective approach may also be vulnerable to biasing effects such as selective memory, denial, and over-reporting. Patients with schizophrenia and methamphetamine abuse are likely to report more negative events from family and its context because they tend to focus on adverse sides of life, searching for causes for their current situation.

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