

**Change processes questionnaire for treatment of drug dependents based on transtheoretical model:  
Psychometric properties in Iran 2016**Reza Shahrabadi<sup>1</sup>, Gholamreza Garmaroudi<sup>2</sup>, Davod Shojaeizadeh<sup>3</sup>, Mehdi Yaseri<sup>4</sup>

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**Type of article:** Original**Abstract**

**Background:** Drug abuse is a serious subject that can lead to social, economic, cultural and health problems. The routine approaches in treatment of drug abuse are either medication or non-medication methods. Non-medication approach is focused on mental and social health. Non-drug treatment requires appropriate tools.

**Objective:** To determine the validity, reliability, and structure of the Processes of Change Questionnaire.

**Methods:** In this cross-sectional study, which was conducted in 2016, three hundred sixty-two drug dependents in Sabzevar Substance Abuse Treatment Centers (Iran) were enrolled in the study. Samples were selected through the multi-stage sampling method. They completed the 40-item Processes of Change Questionnaire (drug version). In this study, Backward-Forward method, confirmatory factor analysis (CFA), test-retest, Cronbach's alpha, content validity ratio (CVR) and content validity index (CVI) were used, using AMOS 5.0 and SPSS version 11.5.

**Results:** Findings of the CFA showed the questionnaire has a good fit. The fit index of the CFA was calculated as 0.75. Cronbach's alpha was 0.93 for the whole questionnaire, and ranged from 0.51 to 0.88 for its different domains. Also, intraclass correlation coefficient (ICC) and content validity were satisfactory.

**Conclusion:** Based on the findings of this study, the processes of change 40-item questionnaire: drug version was a credible, reliable and valid tool to identify effective factors in the treatment drug abuse among the population of the Sabzevar, Iran.

**Keywords:** Transtheoretical Model, Substance-Related Disorders, Psychometrics

**1. Introduction**

Drug abuse is one of the most important psychosocial problems which may have harmful effects on the individual, family and culture, and is a serious barrier to human growth and development (1, 2). Now, drug abuse has become a public health problem worldwide (3). According to the world drug report of the United Nations office on drugs and crime in 2016, one in twenty adults, or a quarter of a billion people between the ages of 15 and 64 years, used at least one drug in 2014 (4). In Iran in 2012, 2.65 percent of people between the ages of 15 and 64 years used drugs. Also, according to the study of Zardosht et al. in 2010 (5), 35 percent of patients who were admitted to emergency in the city of Sabzevar, had experienced drug abuse. Therefore, treatment of drug dependents is a priority. The two methods of treatment for this health problem include medication and non-medication treatment patterns (6). In medical treatment, methadone or buprenorphine maintenance treatment are usually used (7). In non-medication

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Received: November 10, 2016, Accepted: April 09, 2017, Published: July 2017

iThenticate screening: March 24, 2017, English editing: June 12, 2017, Quality control: July 02, 2017

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treatment, there are a variety of patterns, including individual, group, family and self-help treatments (8). Patterns of non-medication treatments include individual, group, family, self-help therapies (9). The main objectives of this type of treatment are to raise awareness and understand themselves and their surroundings (10). Therefore, the environment and knowledge are effective factors in drug abuse treatment (11) and on the environment; behavioral therapy should be considered (12). Behavioral therapy can be used with various techniques such as modeling, adaptability, relaxation training, rehearsal, contingency management, cue exposure, aversion and perceived susceptibility (13). Also with knowledge, cognitive therapy should be considered (14) it is formed with raising awareness and desirable attitudes (15). The results of several studies in Iran (16, 17) show that non-medication treatment of drug dependents is effective. The use of models and tools for non-medication treatment is functional (18). Also, it is necessary to apply models and tools in educational programs because the intervention will be purposeful and implemented more accurately if it is based on model principles and values (19). In non-medication treatment, it is used from different models. One of these is a transtheoretical model (TTM) (19). This model is used from Bandura, Bergin and Garfield, Freud, Rogers and Skinner views (19). The model was designed in 1983, initially based on the behavior of drug abuse. Over time, numerous surveys were employed, including smoking cessation, fruit and vegetable consumption, use of contraceptives, physical activity, breast cancer screening, prevention of skin cancer, alcohol consumption, weight control and prevention of AIDS (18-22). This model was revised by Prochaska in 1992 and 1997. It considers step by step treatment and social factors, so is widely applied in the treatment of drug abuse (19-21). The model consists of four structures: a) Stages of Change b) Self-Efficacy / temptation c) Decisional Balance and d) Processes of change (19). Among these structures, the process of change structure has 10 components. The structure is divided into two sections a) Behavioral process including Counter Conditioning, Stimulus Control, Self-Liberation, Reinforcement Management and Helping Relationship and b) Experimental process, including Consciousness Raising, Dramatic Relief, Self-Re-Evaluation, Environmental Re-evaluation and Social Liberation (19). For review, the structure, Processes of Change Questionnaire (Drug Version) was designed by Prochaska for consumers of alcohol and drugs (22). This questionnaire is designed into two, from short (20 items) (23) and long (40 items) (23). This questionnaire (40 items) has been used in Mexico for American women so that appropriate validity and high reliability have been reported (24). Because of necessary interventions for drug dependence treatment in Iran (25) and that the interventions to change must be based on a model (19), it is highly important to devise a proper tool with proven validity and reliability that can be applied to the Iranian population. The present study aimed to determine the validity and reliability of the Processes of Change Questionnaire (Drug Version-40 items).

## **2. Material and Methods**

### ***2.1. Research design and sampling***

This methodological research (Cross-sectional) was performed in 2016 on 362 drug dependents in Sabzevar Substance Abuse Treatment Centers, Iran. In this study, for generalization of confirmatory factor analysis (CFA) results must for any questions be between 5 to 10 people of the target group who complete the questionnaire (26,27). Therefore, in this study, 400 samples were considered for 40 questions that finally, 362 drug dependents completed the questionnaire. The number of drug abuse treatment centers in Sabzevar were 32 and each center had between 50 to 100 drug dependents. In this study, multi-stage sampling (stratified- cluster in two stages) was used. First Sabzevar was divided into four geographical regions as class (stratified) and Substance Abuse Treatment Centers in each region as clusters were considered. Then in each region, based on the number of covered drug dependents, required numbers of clusters (treatment centers) were selected randomly. Finally, in each cluster based on the list of drug dependents, the numbers of required samples were selected randomly.

### ***2.2. Selection criteria***

Inclusion criteria were, having health records in the Substance Abuse Treatment Center and lack of mental disorders such as schizophrenia. An exclusion criterion was unwillingness of drug dependents to participate in the research (at any time of the research).

### ***2.3. Instrument, data collection and analyses***

Participants completed the processes of change 40-item questionnaire: drug version (23) which is used for drug abuse behavior. The questionnaire has two domains and each domain has five structures, including a) Behavioral process, including Counter Conditioning, Stimulus Control, Self-Liberation, Reinforcement Management and Helping Relationship and b) Experimental process, including Consciousness Raising, Dramatic Relief, Self-Re-Evaluation, Environmental Re-evaluation and Social Liberation (22). This questionnaire was designed based on a 5-point Likert scale (Never=1, Seldom=2, Occasionally=3, Frequently=4 and Repeatedly=5) (23). In this study,

Backward-Forward method was used. Before performing the study, permission was granted by DiClemente (22) to apply this questionnaire by e-mail. First, the questionnaire was translated from English into Persian by a panel of health education experts and an English language translator. Its items were then revised according to the cultural norms of Iran and presented in the final version in the format of comprehensible items. Then, the items in Persian were translated into English by three translators. An English file was sent to the author of the questionnaire, but did not receive a response, unfortunately. Finally, the translation of English was compared with the original questionnaire by two translators of English. No difference was found between the two English translations. Face validity was determined by asking the points of views of experts and a sample of the target group. Ten experts in health education and promotion and 20 drug dependents who were randomly selected from the target group presented their views about fluency and understandability of the items. In this study, to assess the content validity of the questionnaire, content validity ratio (CVR) and content validity index (CVI) were determined. Content validation refers to a process that aims to provide assurance that a questionnaire measures the content area it is expected to measure (28). Ten experts were invited to complete a questionnaire for rating items into one of three categories (for CVR): “essential”, “useful, but not essential” or “not necessary” (27). Then the questionnaire’s CVR was assessed; according to the Lawshe (29) table if the item score was over 0.62, the item was considered as an appropriate and necessary one. Also, categories (for CVI): “relevance”, “clarity”, and “simplicity” examined the questions of the questionnaire based on the four-point scale (30). Items with the score of over 0.75 were retained as appropriate ones (30). Factorial validity of the Persian version of the Processes of Change Questionnaire was assessed using CFA. With CFA, factors were assessed with regard to the number of factors, number of questions and the pattern of questions for each factor (27). The minimum sample size required for the CFA was 5 per item (27). The questionnaire consists of 40 items; thus, the minimum sample size required was 200. In this study, the number of samples was 362. This means that 9 samples were collected for each question. The CFA was conducted to examine the questionnaire constructs using Amos software. Several indexes are usually used in order to assess the adequacy of model fit (27). In this study, to assess the fit of the proposed questionnaire, the relative Chi-square, the goodness of fit index (GFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI) and the root mean square error of approximation (RMSEA) were used. Index values are different: Acceptable model fits are indicated by relative Chi-square value smaller than 5. GFI and AGFI values vary between 0 and 1 with values greater than 0.9 indicating the model’s goodness of fit. The CFI index also varies between 0 and 1, with values closer to 1 making the model more appropriate and values in excess of 0.9 indicating the model’s good fit. RMSEA values lower than 0.05 indicate a good fit; values about 0.08 indicate a moderate fit and values higher than 0.1 indicate the model’s poor fit (27, 31, 32). Reliability of the questionnaire for the whole, and then for each domain, was measured by Test-Retest using the intraclass correlation coefficient (ICC) with associated 95% confidence interval (95% CI) and Cronbach's alpha. Participants filled the questionnaires twice at an interval of two weeks. The ICC values were considered excellent if  $\geq 0.81$ , good from 0.61 to 0.80, moderate from 0.41 to 0.60, fair from 0.21 to 0.40 and poor if  $\leq 0.20$  (33). Data were analyzed by AMOS 5.0 and SPSS version 11.5.

### 3. Results

In this study, 362 drug dependents were entered. The mean age of participants was  $35.0 \pm 8.3$  years, ranging from 18 to 76. The characteristics of the study sample are shown in Table 1. In this study, CVR for each of the items was between 0.62 and 0.85. Also, CVI for each of the items was higher than 0.80.

**Table 1.** Demographic characteristics of the study sample (n=362)

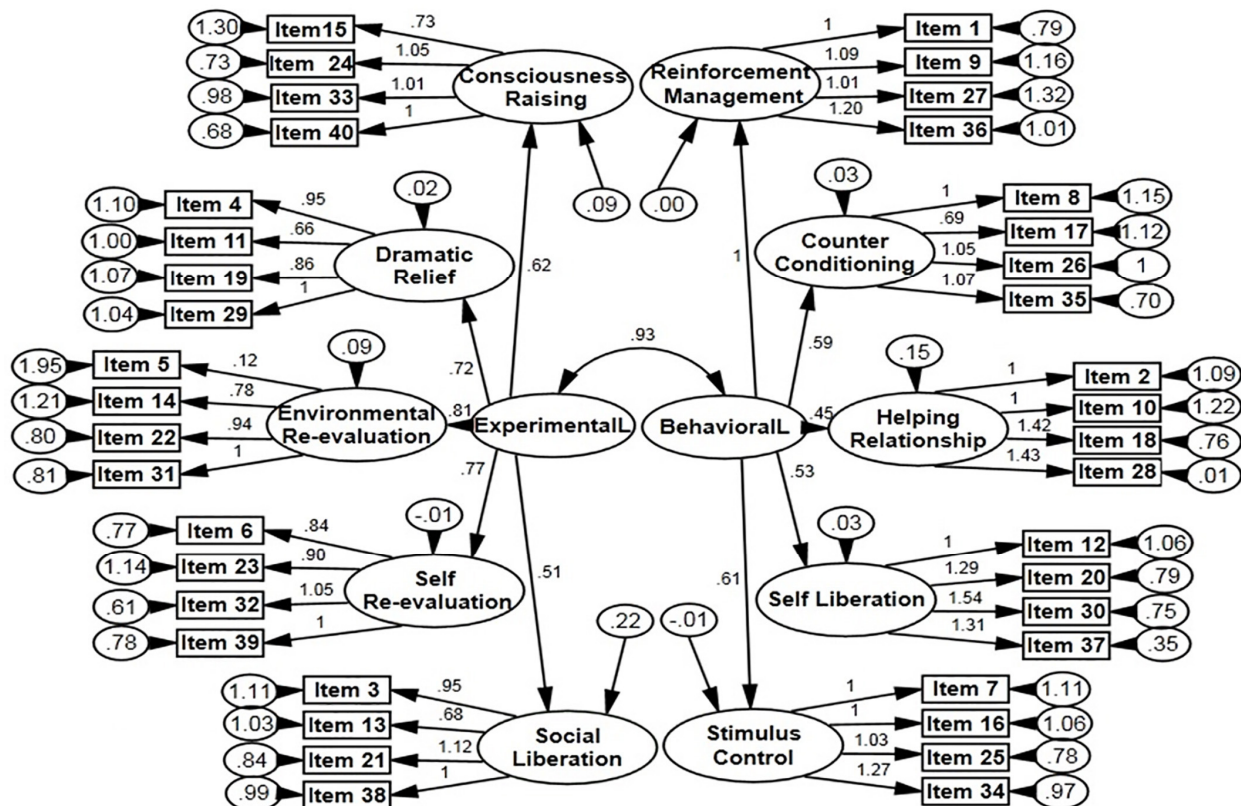
Variables		n	%
Gender	Man	306	84.5
	Woman	56	15.5
Age (year)	<20	5	1.4
	20-30	104	28.7
	31-45	219	60.5
	>46	34	9.4
Marital status	Single	126	34.9
	Married	236	65.1
Education (year)	< 12	313	86.5
	12	25	6.9
	> 12	24	6.6

The CFA was performed and the following fit indices were found: the goodness of fit index (GFI) =0.75; the adjusted goodness of fit index (AGFI) = 0.72; the comparative fit index (CFI) = 0.74; the root mean square error of approximation (RMSEA) =0.071 and the relative Chi-square =2.72,  $p < 0.001$ . Since a remarkable improvement on fit indexes was not observed, no modifications were made. Thus, the model was accepted in its current form. The results are presented in Figure 1. Cronbach's alpha was applied separately for all twelve factors ranged between 0.51 and 0.88, which are accepted value. In addition, the reliability of the instrument as measured by ICC was satisfactory. The results are given in Table 2.

**Table 2.** The internal consistency and stability of the questionnaire as measured by Cronbach’s alphas and intraclass correlation coefficient (ICC)

Variable	Cronbach alpha	ICC	Number of items	95% CI	
				Lower	Upper
<b>Experimental process</b>	<b>0.87</b>	<b>0.916</b>	<b>20</b>	<b>0.83</b>	<b>0.96</b>
Consciousness Raising	0.65	0.880	4	0.76	0.94
Dramatic Relief	0.59	0.642	4	0.37	0.81
Environmental Re-evaluation	0.51	0.914	4	0.83	0.96
Self-Re-Evaluation	0.70	0.796	4	0.61	0.90
Social Liberation	0.61	0.757	4	0.63	0.86
<b>Behavioral process</b>	<b>0.88</b>	<b>0.924</b>	<b>20</b>	<b>0.85</b>	<b>0.96</b>
Reinforcement Management	0.62	0.930	4	0.86	0.97
Counter Conditioning	0.58	0.691	4	0.45	0.84
Helping Relationship	0.65	0.851	4	0.71	0.93
Self-Liberation	0.69	0.807	4	0.63	0.90
Stimulus Control	0.62	0.825	4	0.67	0.91
<b>Total</b>	<b>0.93</b>	<b>0.934</b>	<b>40</b>	<b>0.87</b>	<b>0.97</b>

Note: Figures in **bold** are calculated for Experimental process, Behavioral process and for all items.



**Figure1.** The results obtained from the confirmatory factor analysis (items are observed variables, and subscales are latent variables).

#### **4. Discussion**

This study assessed psychometric properties with application of the transtheoretical model for the translated Iranian version of the Processes of Change Questionnaire (Drug Version) for drug abuse behaviors. Results of CFA showed the subscales of the questionnaire are approved. These ten subscales are one of the important structures in TTM that is called processes of change. The process of change is a key construct of the TTM (19) that is used to make progress in the desired behavior in health interventions. In fact, this model suggests that the process of change should be considered when designing a tailored intervention for drug abuse treatment so that in many studies (34-36), health behaviors are used from TTM. In this study, to assure instrument reliability, two statistical tests were performed: Cronbach's alpha coefficients and Test-Retest reliability showed that the indicated tool has good internal consistency. The results of this study were consistent with the study of Sarbandi et al. (37) and Gaume et al. (38). The study of Sarbandi et al. (37) assessed the transtheoretical model questionnaire for smoking cessation in the Iranian version. ICC of processes of change obtained 0.70 (37) that showed good reliability, and our study obtained 0.93 that showed excellent reliability. The findings indicated that the translated questionnaire has an acceptable fit (According to indicators GFI, AGFI, CFI, RMSEA,  $\chi^2/df$ ). Many studies have assessed psychometric properties of TTM-based questionnaires that relate to health behaviors, especially drug abuse, that are in agreement with our findings for approval of the questionnaire (39-41). This result was similar to findings by Massey et al. (42) for the processes of change in a Psychological Skills Training Questionnaire. In general, the result showed that it was a valid instrument for measuring drug abuse behavior change and treatment among Iranians. Theory-based tools are an important factor for implementing, monitoring and evaluating health education and promotion interventions. According to this, the findings of this study can be helpful for non-medication treatment in all fields of education and research. Prochaska et al. (22) assessed that the psychometric properties of processes of change 40-item questionnaire used for cessation of smoking; had a good fit according to the CFA (GFI >0.7) as in our study. In Prochaska's study (22), internal consistency was established with alpha coefficients ranging from 0.69 to 0.92 which was slightly in line with the results of this study (between 0.51 and 0.88). Limitations of this study were being a self-report questionnaire and lack of cooperation by some of the drug dependents in completing the questionnaire.

#### **5. Conclusions**

This study, by translating and psychometric properties is one of the important tools for the assessment of drug abuse behaviors in health education and promotion of drug dependents, and provides the context for the widespread application of the tool. According to the results of this study, the 40-item Process of Change Questionnaire (drug version) was confirmed to be an efficient tool to use in non-medication interventions for drug abuse treatment and assessment of drug abuse behaviors promotion in Iran; researchers and therapists can use it as a valid and reliable tool.

#### **Acknowledgments:**

This paper was devised from the first author's PhD thesis at the School of Public Health, Tehran University of Medical Sciences. The institutional ethics committee approved the ethics of the study (Ref: IR.TUMS.REC.1394.1406). The authors thank the School of Public Health, Tehran University of Medical Sciences for its support.

#### **Conflict of Interest:**

There is no conflict of interest to be declared.

#### **Authors' contributions:**

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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