



# Factorial structure and psychometric properties of self-motivation for smoking cessation scale in a sample of Turkish adolescents

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## Abstract

The aim of this research is to examine validity and reliability of Turkish version of Self-motivation for Smoking Cessation Scale for teenagers and its Turkish adaptation. Data for this research collected from 242 teenagers. In this study, firstly, Pearson Product-Moment Correlation was used in order to investigate the relationship between Turkish form and English form. Confirmatory factor analyze was done for structure validity. The reliability of the scale was examined with internal consistency method. Furthermore, t-test and corrected item-total correlation were used for item analysis. In result of the confirmatory factor analysis, not only chi-square ( $\chi^2= 140,12$   $df= 51$ ,  $p= 0.0000$ ) was significantly, but also indices of fit RMSEA= .08, GFI= .92, CFI= .93, IFI= .93, NFI= .90, NNFI= .90, AGFI= .87 and SRMR= .06 was found. Internal consistency of scale's factors (autonomous regulation, controlled regulation) were found them as .81 and .76 respectively. Corrected item-total correlations were ranged between .31 and .71. T values were ranged between 5.87 and 15.79. When findings were analyzed in general, Self-motivation for Smoking Cessation Scale for teenagers was seen as valid and reliable.

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*Keywords:* Smoking cessation, motivation, autonomous regulation, controlled regulation, adolescent, scale;

## 1. Introduction

Cigarette smoking is shown by studies as one of pivotal causes of death and disease in the world ( Lopez, Mathers, Ezzati, Jamison, & Murray, 2006 ). In this context, cigarette smoking may be the greatest risk factor for the development of adolescents and health of future generation. Because researchers stated that smoking is a leading disability in many development areas. (Doll, Peto, Boreham, & Sutherland, 2004; Sanchez, Opaleye, Martins, Ahluwalia, & Noto, 2010; Reid, Hammond, Boudreau, Fong, & Saipush, 2010; Reitzel Mazas, Cofta-Woerpel, Li, Cao, 2010; Sims, 2009). In addition, studies show that most of the person who smoking died from lung cancer or chronic obstructive lung disease have coronary heart disease (Ahmed et al., 2008; Ockene & Miller, 1997). Likewise, the most consistent evidence supports smoking and nicotine dependence as increasing the risk of panic disorder and generalized anxiety disorder (Maylon, Jacka, Pasco, & Berk, 2012).

Smoking starts in adolescence for 90% of adults (Etter, Prokhorov, & Perneger, 2002; Sims, 2009) with an average age of initiation ranging between 13-15 years (El-Mhamdi, Wolfcarius-Khiari, Mhalla, Ben Salem, & Soltani, 2011; Fawibe, Shittu, 2011; Çelikel, Çelikel, & Erkorkma, 2009). Furthermore, smoking related diseases will continue to increase if we do not target interventions to prevent smoking initiation among adolescents.

Ahmed et al. (2008) found that parental and sibling influence, close friends and individuals who smoke at home may lead smoking. Killen et al., (1997) indicated that teen smoking and progression to regular use are complex and are best conceptualized from an interactional perspective. Peer factors have been shown to be a strong predictor of initiation of smoking (cited in Buttross & Kastner 2003). Likewise, Babatunde, Omowaye, Alawode, Omede,

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Olomofe, & Akinyandenu (2012) stated that influence of friends and going to parties/clubs are major factors contributing to smoking habit. Buttross & Kastner (2003) maintained that peer, family, and intrapersonal factors all play a role in the continuum of initiation to regular use. Finally, intrapersonal variables such as sex, ethnicity, depression, and other substance use play an important role as risk factors for tobacco use (Lloyd-Richardson, Papandponatos, Kazura, Stanton, & Niaura, 2002).

Quitting smoking may be a difficult, complex and lengthy process, many smokers may feel that they are simply not ready to quit. Individuals who do intend quitting must overcome a considerable number of challenges in order to quit smoking. Physically, nicotine addiction may play the most important role in the continuation of cigarette smoking. Furthermore, psychological factors come into play surrounding the decision to quit smoking. These factors may both hinder smokers from trying to quit and increase their motivation to quit (O'Brien, 2010). Babatunde, Omowaye, Alawode, Omede, Olomofe, Akinyandenu (2012) indicate that health problems played a major role in attempts to quit smoking. Furthermore, they stated that Peer education in schools emphasizing knowledge of the health implications of smoking as well as early diagnosis of smoking related health problems encouraged for smoking cessation. Buttross & Kastner (2003) found that smoking prevention programs are particularly effective in reducing onset of smoking behavior. Finally, their study has seen that behavioral cessation programs have been shown to be effective in reducing teenage smoking.

The general consensus in the literature demonstrates that an interest in quitting is a strong predictor of actual quitting behaviors among smokers (Henrikus, Jeffery, & Lando, 1995; Kozlowski et al., 1999). So it can be anticipated that individuals who have attempted to quit smoking before will have a stronger degree of intention to quit than smokers who have never attempted to quit. In addition, Copeland, Brandon & Quinn, (1995) indicate that outcome expectancies about the consequences of smoking are largely connected with quitting behaviors. However, O'Brien (2010) found that outcome expectancies may not be a crucial factor in motivating smokers to quit.

In general, it is evaluated about smoking cessation, although most of smokers wish to quit smoking they don't quit it. One of the most important reasons of this state may be unmotivation for quit smoking. So motivation may be one of the key elements in the smoking-cessation process. In addition, one another factor for quit smoking is motivation (Curry, Grothaus, & McBride, 1997). Marlatt, Curry & Gordon (1988) maintained that the motivation to quit smoking referred not only of a sufficiently valid reason such as health risk but also a strong craving to quit. Also they stated that a strong motivation to quit was important for both initial success and long-term maintenance. Despite the evidence for the role of autonomous motivation, studies have not specifically focused on adolescent and teenage motivations. The adolescent years are characterized by the developing need for personal freedom and autonomy. Smoking may be experienced as representing a sense of freedom and autonomy (Joseph, Grimshaw, Amjad, & Stanton, 2005).

Furmanski (2003) called the idea of increasing motivation to quit a "tremendous and virtually untapped opportunity." One way to generate such strategies is to examine closely what typically motivates cigarette smokers to quit (cited in McCaul, Hockemeyer, Johnson, Zetocha, Quinlan, & Glasgow, 2006). Research on motivation for smoking cessation has revealed that different types of motivation contribute to successful smoking cessation. Curry, Wagner & Grothaus (1990) found that smokers with higher levels of intrinsic relative to extrinsic motivation were more likely to achieve abstinence from smoking. So it can say about individuals who smoking are more likely to be successful to quit smoking if they have high levels of intrinsic motivation. In other words, they may be more motivated by internal rather than external reasons to quit smoking, such as social pressure (cited in O'Brien, 2010). Furthermore, McCaul et al. (2006) found that health concern was the primary motive for quit attempts. These results fitted with theoretical reasoning that persons wish to control danger and negative affect. The results also suggest that health professionals should continue emphasizing the negative health consequences of smoking to motivate cessation attempts.

Examining the literature about smoking cessation, it is lacking on the availability of both a sound theoretical basis and scale for evaluation of applications for developing interventions aimed at adolescent smoking cessation. It is thus hoped that this study would provide a foundation for the derivation of a theory-based approach to researching and understanding adolescent tobacco and helping to enhance motivation for smoking cessation attempts. So aim of

this present study is examining the psychometric properties of the Turkish version of the Self-motivation for Smoking Cessation Scale for Teenagers.

## **2. Method**

### *2.1. Participants*

Participants of the study consisted of 242 eight-grade students in Sultangazi, İstanbul. Participants include 99 males and 143 females. All the participants participated to the study voluntarily. The data collection and its analysis were done anonymously. Ages of individuals participating to the study ranked between from 13 to 15.

### *2.2. Procedure*

The participants were asked to complete the Turkish version of the Self-motivation for Smoking Cessation Scale, the Turkish version of the smoking-specific compensatory health beliefs scale and the Turkish version of the decisional balance scale for adolescent. They were told that their responses would be treated confidentially and anonymously. The entire procedure took about 30 minutes.

Students were invited to indicate their interest in completing the same questionnaire again in the following month. Those who indicated interest to do, so they were approached again for filling in the Self-motivation for Smoking Cessation for the second time. Analysis was computed using the data collected during the first session. The data gathered from the second session were only used for establishing test–retest reliability scores.

### *2.3. Instrument*

#### *2.3.1. Self-motivation for Smoking Cessation*

The scale was developed by Joseph et al., (2005) in order to measuring self-motivation for smoking cessation. The self-motivation for smoking cessation questionnaire contained the 12 questions, using a seven-point scale with the disagree completely–agree completely response format. The scale includes Two factors representing the self-motivation; “autonomous regulation” and “controlled regulation”. The first factor, was labelled ‘autonomous regulation’. This factor has six items (e.g., I do not want to carry on with it as a habit). The second factor was labelled ‘controlled regulation’. This factor has six items (e.g., I want others to approve of me).

### *2.4. Data Analysis*

In the proces of translation of the Self-motivation for Smoking Cessation into Turkish, 3 expert translators, translated scale items firstly into Turkish, and then back into English again to examine their consistence. The resulting form was then re-examined by three experts in the Turkish language and literature to check the meaning and grammar. Following this, the Turkish version was given to 43 adolescents who were asked to identify unclear items. After that, scale’ Turkish form and English form were applied to adolescent in order to examined between two forms linguistic equivalence. In scale adaptation studies, confirmatory factor analysis were used for structure validity. To determine the reliability of the scale, Cronbach’s (1951) Coefficient Alpha and test–retest reliability were used. T-test and corrected item-total correlation were used for item analysis.

### *2.5. Linguistic Equivalence*

In this study, firstly, the linguistic equivalence of the Self-motivation for Smoking Cessation Scale was examined between Turkish form end English form. Results are illustrated in Table 1.

Table 1. The Linguistic Equivalence of The Self-motivation for Smoking Cessation Scale

Factors	Application	$\bar{X}$	DF	r
Autonomous regulation	English form	40,53	3,99	.74**
	Turkish form	41,46	1,23	
Controlled regulation	English form	35,53	6,73	.78**
	Turkish form	37,10	5,56	

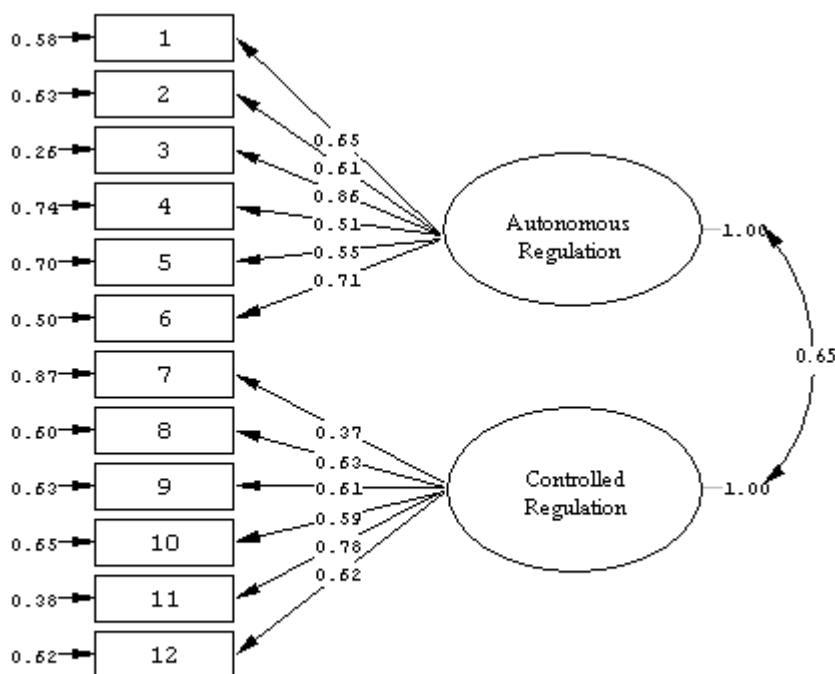
\*\*p<0.001, \*p<0.05

According to the result of analysis, between Turkish form end English form correlation coefficients were 0.74 and 0.78 respectively and were statistically significant at the  $p<0.001$  level.

## 2.6. Structure Validity

### 2.6.1. Confirmatory Factor Analysis

Four factors of the Self-motivation for Smoking Cessation Scale were analyzed with confirmatory factor analysis to investigate the factor structure to determine at which point theory and reality diverge from each other, and to detect problematic areas using LISREL 8.51. Results are illustrated in Figure 1.



Chi-Square=140.12, df=51, P-value=0.00000, RMSEA=0.085

Figure 1. Path Diagram and Factor Loadings Related to the Self-motivation for Smoking Cessation Scale

Confirmatory factor analysis performed to confirm the two-factor structure found in original form of scale for structure of the Self-motivation for Smoking Cessation Scale in CFA. In the result of confirmatory factor analysis, it was found that model's accordance index is examined and Chi-square value is meaningful ( $\chi^2=140,12$ ,  $df=51$ ,  $p=0.0000$ ). Accordance index values were found as  $RMSEA=.08$ ,  $AGFI=.87$ ,  $NFI=.90$ ,  $NNFI=.90$ ,  $CFI=.93$ ,  $GFI=.92$ ,  $IFI=.93$ , and  $SRMR=.06$ . As illustrated in Figure 1, the model has the close fit indices.

Schermelleh-Engel, Moosbrugger, & Müller (2003) stated that reasonable fit indices of models range between  $0 \leq \chi^2/df \leq 3$  for  $\chi^2/df$ ,  $0.01 \leq p \leq 1.00$  for  $p$ ,  $0 \leq RMSEA \leq 0.08$  for the Root Mean Square Error of Approximation;  $0.85 \leq AGFI \leq 1.00$  for the Adjusted Goodness of Fit Index;  $0.90 \leq NFI \leq 1.00$ , for the Normed Fit Index;  $0.95 \leq NNFI \leq 1.00$  for the for the;  $0.95 \leq CFI \leq 1.00$  for the Comparative Fit Index; and  $0.90 \leq GFI \leq 1.00$  for the Goodness of Fit Index; and  $0 \leq SRMR \leq 0.10$  for the Standardized Root Mean Square Residual. AGFI values typically range between zero and one with larger values indicating a better fit. A rule of thumb for this index is that 0.90 is indicative of a good fit relative to the baseline model, while values greater than 0.85 may be considered as an acceptable fit. Furthermore, Hu and Bentler (1999) gave evidence that 0.90 might not be a reasonable cut-off for all fit indices under all circumstances. They suggested raising the rule of thumb minimum standard for the CFI and the NNFI from 0.90 to 0.95 to reduce the number of severely mis-specified models that are considered acceptable based on the 0.90 criterion. In this regard, the results indicated that this model has acceptable fit indices.

### 2.7. Reliability

Cronbach's Alpha and test-retest reliability were used in order to examine the reliability of the scale. Scale's internal consistence reliability coefficients were found .81 for the autonomous regulation factor; .76 for the controlled regulation factor, were statistically significant at the  $p < 0.01$  level. These values were close to those reported in the study of Guo et al. (2009) (in that study, Cronbach's alpha coefficients were found .91 for autonomous regulation factor; .84 for controlled regulation factor). If we consider that preassumed reliability is 0.60 (Büyükoztürk, 2010) that can be used in research, scale's reliability level is enough. Furthermore, test-retest reliability was used to examine the reliability of the factors. The findings concerning the test-retest reliability analysis are shown in Table 2.

Table 2. The Test-retest the Self-motivation for Smoking Cessation Scale

Factors	Application	$\chi^2$	df	r
<b>Autonomous Regulation</b>	First application	39,75	4,90	.62**
	Second application	37,95	8,63	
<b>Controlled Regulation</b>	First application	32,95	6,86	.57**
	Second application	33,15	9,81	

\*\*p < 0.001, \*p < 0.05

Scale's test-retest reliability for the autonomous regulation and the controlled regulation factors were .62, .57, respectively.

### 2.8. Item Analysis

Corrected item-total correlations and T-test, which is comparison of lower 27% and upper 27% groups were formed according to total scores of the test, were used for item analysis. The findings concerning the item analysis are shown in Table 3.

Table 3. The Items of the Self-motivation for Smoking Cessation Scale, Corrected Item-total Correlation, and T-test

Items	Corrected Item-total Correlation		T-test
	Autonomous Regulation	Controlled Regulation	
1	.58		7,16***
2	.52		7,89***
3	.71		5,87***
4	.54		13,33***
5	.56		11,98***
6	.62		8,17***
7		.31	7,74***
8		.58	15,79***
9		.49	15,50***
10		.47	8,87***
11		.68	15,24***
12		.52	9,89***

\*\*p < 0.001, \*p < 0.05

In the result of the item analysis, corrected item-total correlations ranged from a low of 0.31 to a high of 0.71; t (df=128); t-test results ranged from a low of 5,87 (p<.001) to a high of 15.79 (p<.001); and were statistically significant at the p<0.001 level.

### 3. Discussing

Intrinsic motivation and extrinsic motivation are more important factors for quitting smoking. Adolescents with higher intrinsic motivation may be more successful than extrinsic motivation while abstaining from smoking. However, a small degree of extrinsic motivation in addition to high intrinsic motivation is important in quitting smoking, as external pressures can be internalized into an individual's own reason for quitting (Curry et al., 1990 cited in O'Brien, 2010).

In the literature, it is seen that there are limited number of studies on this subject, so such scales must be developed and adapted in order to research in Turkish. Therefore, study was aim to adapt The Self-motivation for Smoking Cessation Scale into to Turkish and to examine the factor structure of Self-motivation for Smoking Cessation Scale by confirmatory factor analysis. The confirmatory factor analysis accepted criteria of good fit is that GFI, AGFI, CFI, IFI, and NFI indices are above .90, RMSEA and SRMR are below .10 (Schermelleh-Engel, Moosbrugger & Müller, 2003). A rule of thumb for this index is that .90 is indicative of good fit relative to the baseline model, while values greater than .85 may be considered as acceptable fit. Furthermore, Hu and Bentler pointed out that .90 might not be a reasonable cutoff for all fit indices under all circumstances. They also suggested increasing the rule of thumb minimum standard for the CFI and the NNFI from .90 to .95 to reduce the number of severely misspecified models that are considered acceptable based on the .90 criterion (Hu & Bentler, 1999). In this regard, the results indicated that present model of scale has been acceptable fit indices and obtained model was a good fit to the data.

In the scale's reliability analysis, internal consistence reliability coefficients were found high and meaningful and they showed to be reliable of scale and its each factors. If we consider that preassumed and required reliability is .70 (Büyüköztürk, 2010; Çokluk, Şekercioğlu, & Büyüköztürk, 2010; Spahi, Yurtkoru, & Çinko, 2008), the scale's reliability level is adequate. In this context, it can be said that satisfactory to good internal consistency reliability of the scale were found (p < .001). Corrected item-total correlations and t-test results were statistically significant at the

$p < 0.001$  level. We can say that Turkish form of the Self-motivation for Smoking Cessation Scale can be used as valid and reliable as a result of this study.

There were some limitations in this study. First, the age ranges of samples were severely restricted. Second, the sample groups are only of Turkish adolescents in school. Further studies of adolescents randomly should be select from diverse age groups, cultural backgrounds, educational backgrounds, and geographical areas should be undertaken to build the validity and reliability database of the Self-motivation for Smoking Cessation Scale. In conclusion, this research is an important first step in measuring Self-motivation for Smoking Cessation among adolescents. This study is limited by our focus on youths residing in a single geographic region. And while we believe that respondents' subjective experiences are important to understand, this focus also has limitations, in that objective measures/observations (e.g., of Self-motivation for Smoking Cessation) might reveal a different pattern of results.

There can be some suggestions as a result of validity and reliability studies. Despite this initial adaptation of the Self-motivation for Smoking Cessation Scale suggests that it seems both a reliable and a valid measure of self-motivation for smoking cessation, some important points indicate areas that require future research. First, the current study did not include behavioral or experimental correlates. For example, the generalizability of our findings is limited by our recruitment of only adolescent students who their age ranged from 13 to 15. Thus, the next goal will be to obtain a relatively heterogeneous group of participants rather than only groups of students in Turkey (e.g., in adults). In addition, it is required to test the self-motivation for smoking cessation in relation to other concepts such as attitudes and descriptive norms to analyze their contribution to self-motivation for smoking cessation. In summary, further psychometric research is now required to validate the scale and to test whether it is able to predict successful quitting.

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#### Appendix A. Motivation for Smoking Cessation in Teenagers

Items	English	Maddeler	Türkçe
	I think about stopping smoking because.....		Sigarayı bırakmayı düşünürüm çünkü...
1	I do not want to carry on with it as a habit	1	Alışkanlık olarak devam etmesini istemiyorum.
2	It will be good to know I can give it up	2	Vazgeçebilmeyi bilmek iyi olacak.
3	I personally believe giving up smoking will be the best for my health	3	Sağlığım için sigarayı bırakmamın iyi olacağını düşünüyorum.
4	I feel it is very important for my health	4	Sağlığım için çok önemli olduğunu hissediyorum.
5	I have thought carefully and believe it is very important for many aspects of my life	5	Dikkatli ve inancılı olarak düşündüğümde çoğu açıdan yaşamım için önemli.
6	I want to take responsibility for my health	6	Sağlığım için sorumluluk almak istiyorum.
7	It is easier to do what I am told than to think about it	7	Sigarayı bırakmak, sigarayı bırakmayı düşünmekten daha kolaydır.
8	I want others to approve of me	8	Başkalarının beni onaylamasını istiyorum.
9	I am expected to give it a try	9	Bunu denemem bekleniyor.
10	Others can sometimes be upset with me because I smoke	10	Sigara içtiğimde diğer insanlar bazen üzülebilir.
11	I want others to see I can do it	11	Diğer insanların yapabildiğimi görmesini istiyorum.
12	I feel guilty or ashamed of myself when I smoke	12	Sigara içtiğimde utanç veya suçluluk hissederim.