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Turkish validity and reliability of Multidimensional Health Locus of Control Scale Form A

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Abstract

Aim: The aim of this study was to assess the validity and reliability of the Turkish version of Multidimensional Health Locus of Control Scale Form A.

Methods: The research is a methodological instrument validation study, and the study sample consisted of 275 participants. The data collection phase of the study was completed between 15 July and15 September 2016. The study used data collection tools including a Personal Information Form, the Multidimensional Health Locus of Control Scale Form A, and the Internal-External Locus of Control Scale. Data on sociodemographic variables are presented as percentages and means. Confirmatory factor analysis and correlation analyses were used.

Results: The Cronbach α values of the subdimensions of the Multidimensional Health Locus of Control Scale Form A were determined as acceptable for the internal control, the chance, and powerful other subscales. The confirmatory factor analysis showed acceptable values and acceptable fit for the model fit statistics.

Conclusion: The Turkish version of Multidimensional Health Locus of Control Scale Form A was accepted as valid and reliable.

KEYWORDS

Health Locus of Control Scale Form A, instrument validation, internal-external locus of control, nursing, reliability, validity

SUMMARY STATEMENT

What is already known about this topic?

- The Multidimensional Health Locus of Control Scale is a measurement tool that measures an individual's belief regarding control over their disease or health conditions. The scale consists of three forms: Forms A and B are used to measure the locus of health control in the general population and healthy individuals, while Form C is used in individuals with chronic disease.
- Form A is used frequently across the world, and validity and reliability studies have been conducted by many researchers.
- Form A is also frequently used in studies in Turkey, but no study could be found regarding its reliability and validity for Turkey.

What this paper adds?

- The Turkish version of the Multidimensional Health Locus of Control Form A was determined to be valid and reliable for people aged between 20 and 69 years old. It can be used to measure the health locus of control of individuals within this age range.
- Form A can be used in the measurement of the health locus of control in the 20 to 69 age group in the general population and in

patients with physical or mental illness, in patients' relatives, and in healthy people in this age group.

The implications of this paper:

- In order to develop successful policies on health-related issues and conduct successful interventions, the attributions made by individuals about their locus of control, whether internal, governed by chance, or determined by powerful others are important.
- Measuring locus of control increases success in planning and implementing of health-care education for adolescents, university students, those with chronic illnesses, caregivers, rural workers, and elderly people. It is important for nurses to know individuals' health loci of control when caring for patients.
- All the research has emphasized that the ability of individuals and groups to attain a stated goal is improved when they believe they have internal control. Further research is needed to clarify how the culture and social structure of different countries affect individuals' health loci of control.

1 | INTRODUCTION

Locus of control, a concept in social learning theory, was first used by Rotter (1966); Graffeo & Silvestri, 2006). According to Rotter, internal reinforcement occurs when one believes one's behaviours are in one's own control; external reinforcement occurs when behaviours are believed to be dependent on chance, coincidence, and other powerful persons; and whether one believes in internal or external loci of control influences the formation of personality traits (Rotter, 1966). Those who attribute to themselves a high degree of internal control (internal reinforcement) think that they have the power to change the outcome of an event because they attribute the end result to their own efforts and talents (Ayan & Eser, 2016); while those with an external locus of control (external reinforcement) think that they have no influence on the events they experience and that these events are controlled by chance, fate, god, and/or other people (Rotter, 1990). These differences are due to beliefs about the causes and consequences of the events that people have experienced. The rewards or punishment received by those experiencing an event for the first time affect the person's subsequent behaviour. Repeated rewards or punishment as a result of the same or different events shape behaviours. If they are rewarded for their actions, a person believes that he or she has had an effect on the event and continues the same behaviour. If they are punished, the person avoids this behaviour in the future, believing that he or she does not have control over the outcome (Basım & Şeşen, 2008).

As locus of control has an important influence on how humans behave, many studies have focused on the development of the scales to determine individuals' beliefs about loci of control. One of the first studies in this area was the Internal-External Locus of Control Scale (I-E Scale) developed by Rotter (1966). In this study, Rotter emphasized two dimensions, internal control and external control. A report by Levenson (1973), as a consequence of extensive research on locus of control, argued that the focus on internal control should remain the same, but that the concept of external locus of control should be expanded to include two dimensions, "chance" and "powerful others" (Wallston & Wallston, 1981). To this end, Levenson (1973) developed the Multidimensional Locus of Control Scale (Internal Factors, External Factors/Chance, and External Factors/Powerful Others) by expanding the content of the I-E Scale developed by Rotter (Kourmousi, Xythali, & Koutras, 2015). These studies related to the locus of control were followed by studies in the field of health care. Wallston, Wallston, and DeVellis (1978) developed the Multidimensional Health Locus of Control (MHLC) Scale as a result of health-centred locus of control studies, which included internal and external control, including health professionals as the "powerful others." Three different forms (A, B, and C) of the scale are in use.

The powerful others in the health locus of control are related to the issue of who is responsible for the individual's degree of health or illness. Many patients think that health professionals are primarily responsible in terms of providing health care and that if a health problem arises, it is the job of health professionals to set things right (Wallston & Wallston, 1982). Health professionals, especially doctors and nurses, actively engage in health behaviours and are thus perceived by patients as people who are competent and knowledgeable. Patients with this perception believe that it is right to follow the advice of health professionals and this response shapes their attitudes and behaviours. People who perceive their health condition to improve as a result of their behaviours believe strongly that it is right to seek advice from health professionals and thus develop a belief in powerful others (Brincks, Feaster, Burns, & Mitrani, 2010).

The success of national and international health promotion activities has been made possible by the importance placed on health locus of control studies (Holroyd, Anders, Robinson, & Jackson, 2017). However, the differences in societies and cultures, ethnicity, religious beliefs, and social structures all affect the health locus of control (Rodin, 1986). Every country has its own version of the health locus of control scale, and translations of the MHLC Forms have needed to be developed and validated separately for international use (Athale et al., 2010).

The MHLC Form A developed by Wallston et al. (1978) has been used in many studies in different groups in Turkey; however, validity and reliability studies of the scale have not as yet been performed (Hekimoğlu & Şensoy, 2014; Ulamış & Özmen, 2014; Ustündağ-Budak & Mocan-Aydin, 2005). For this reason, the aim of this study was to examine the validity and reliability of the MHLCA Form in Turkey. An answer was sought to the following question:

Is the Turkish version of the MHLC Scale Form A valid and reliable for the general population in the 20 to 69 year old age group?

2 | METHODS

2.1 | Aim

The aim of the study was to determine the validity and reliability of the Turkish version of the MHLC Form A.

2.2 | Design

The research was a methodological instrument validation study.

2.3 | Translation

Language equivalence was ensured for the MHLC Form A used. In order to achieve language equivalence, three experts were consulted from the field of public health, as well as one academic in English language teaching, one academic in Turkish language and literature, one specialist in translation and interpreting, and one linguistic expert. The back translation method was used to translate the scale. As a result of positive feedback received from the experts, only a few words were edited in the scale and it was then used for the research.

The readability, the intelligibility, and applicability of the MHLC Form A, and the cultural characteristics and the value judgments of the society to which the scale was being applied, were examined. The items in the scale were evaluated by four experts, two from the field of public health, one from the field of statistics, and one from the field of psychiatric nursing.

2.4 | Pretesting

The data collection tools were pretested on 10 people who were not included in the selected sample group. Shortcomings were evaluated, and recommendations taken into account. As a result, the questions in the Personal Information Form were changed. In order not to change the meaning of the items, no correction was made on the scale.

2.5 | Sample/participants

The MHLC Form A contains 18 items. Given that 10 people should be included in the sample for each item, the number of people in the study was calculated to be at least 180. The size of the sample was determined as 275, on the basis that there might be problems such as a lack of responses or missing answers. To select the sample for the study, the quota sampling method was used, and the research group was stratified according to age. Individuals were divided into groups of 10 years, and an equal number of people from each group was included in the study group. The researcher identified the individuals to be included in the study.

The inclusion criteria were that the participants lived in Burdur, were in the age range 20 to 69, were able to understand the questions and express themselves, agreed to participate in the study, and agreed to participate in the test-retest phase.

The research was conducted in the province of Burdur because one of the researchers who carried out this study resides there. The original study for the development of the MHLC Form A was conducted at an American airport with individuals aged 16 to 69 years who agreed to participate in the study. In the original study, the mean age was 42 years (Wallston et al., 1978). In order to obtain similar results to the original study, those between 20 and 69 years old were included in this study. As there is no airport in Burdur, parks, playgrounds, streets, and markets were visited in order to reach the general population. Data were collected from people who agreed to participate in the research. Due to the test-retest phase of the study, participants were asked to give their first names, surnames, phone numbers, and addresses.

2.6 | Data collection

The data collection phase of the study was completed between 15 July and 15 September 2016, and 275 persons agreed to participate. For the test-retest phase, the same data collection tool was applied again after a period of 2 weeks to 75 individuals who had agreed to participate again. The data collection form was given to the participant and the researcher remained with them while they completed the form themselves; this took about 20 to 25 minutes. If the participants were illiterate, the researcher read out the questions and marked down the answers given.

2.6.1 | Data collection tools

The data collection tools for the study consisted of a Personal Information Form with 15 questions about the participants' sociodemographic information, the I-E Scale, and MHLC Form A.

The I-E Scale was formulated by Rotter (1966). The validity and reliability study of the scale in Turkey was conducted by Dağ (1991) with university students. The scale aims to measure individual's perception of internal and external loci of control and their generalized expectancies for their enforcement of internal and external control. The average score varies between 0 and 23 points. An increase in score indicates an increase in the belief in an external locus of control (Dağ, 1991).

The MHLC Form A was developed by Wallston et al. (1978). It measures general health beliefs and consists of 18 items scored in a 6-point Likert-type scale. This form aims to evaluate perceptions of internal control, external control (chance), and control by powerful others in health behaviours and is divided into three subdimensions with six items in each. The highest score obtainable from the scale is 36 and the lowest is 6. The dimension that has the highest scores is accepted as the centre of the health locus of control (Wallston, 1993).

2.7 | Data analysis

Reliability (item statistics and reliability values, internal consistency reliability/Cronbach α, parallel forms reliability/equivalent forms, correlation between subdimensions, and test-retest reliability) and validity (confirmatory factor analysis) analyses of the MHLC Scale Form A were conducted using the SPSS 16 and LISREL software.

Acceptable values in model fit statistics of confirmatory factor analysis were χ^2/SD < 3; RMSEA < 0.08; GFI > 0.90 (İlhan & Çetin, 2014); a Cronbach α > .70 (Kılıç, 2016), and the reliability of the test-retest stage were determined between −1 and +1 (Türk, Karataş, & Bektaş, 2016).

2.8 | Ethical considerations

Written permission was obtained from the Ethics Committee of Burdur Mehmet Akif Ersoy University (Meeting Date: 11.04.2016, Decision Number: GO 2016/14), and the participants' verbal permission was obtained.

3 | RESULTS

3.1 | Sample characteristics

In this study, the participants' mean (SD) age was 44.08 (14.38) years; 50.5% (n = 139) of the respondents were female, 34.5% (n = 95) were university graduates, 76.7% (n = 211) were married, 33.5% (n = 92) had two children, and 64% (n = 176) resided in the provincial centre.

3.2 | Reliability

The total correlations of items in the MHLC Form A were found to vary from a low of 0.22 to a high of 0.58. The only item below 0.25 among the item total correlation coefficients was item 8, which contains the statement, "When I get sick, I am to blame" and had a value of 0.22. When item 8 was removed, the Cronbach α value of.66 rose to.69 (Table 1).

The Cronbach α values of MHLC Form A were.66 for the "internal control" subdimension, .70 for the "chance" sub-dimension, and.76 for the "powerful others" subdimension. When the correlation coefficients of the subdimensions were examined, the only dimension that was below.70 was the "internal control" subdimension (Table 1).

A negative, weak, and significant correlation (P < .03; r:−0.24) was found between the I-E Scale and the "internal control" subdimension of the MHLC Form A and a positive, weak, and significant correlation (P < .01; r: 0.40) was found between the I-E Scale and the "chance" subdimension. No relationship was found between the "powerful others" and the I-E Scale (Table 2).

The MHLC Form A "internal control" subdimension and the "powerful others" subdimension had a positive, weak, and significant correlation (P < .01, r: 0.38); the "chance" subdimension and the "powerful others" subdimension had a positive, very weak, and significant correlation (P < .01; r: 0.21) (Table 2).

TABLE 1 Multidimensional Health Locus of Control Scale Form A Item statistics and reliability values

		Sample[a]		
Items	Subdimension Total Cronbach α	Mean (SD)	Item Total Correlation	Cronbach α Value When Item Removed
Item 1	Internal control α = .66	4.41 (1.47)	0.32	.64
Item 6		4.30 (1.42)	0.46	.59
Item 8		3.69 (1.75)	0.22	.69
Item 12		4.58 (1.39)	0.45	.59
Item 13		4.73 (1.39)	0.48	.58
Item 17		4.82 (1.20)	0.46	.59
Total		26.56 (5.26)		
Item 2	Chance α = .70	3.99 (1.73)	0.39	.67
Item 4		3.18 (1.64)	0.44	.65
Item 9		2.77 (1.68)	0.42	.66
Item 11		2.65 (1.66)	0.41	.66
Item 15		3.35 (1.63)	0.43	.65
Item 16		3.60 (1.68)	0.47	.64
Total		19.56 (6.35)		
Item 3	Powerful others α = .76	3.98 (1.65)	0.55	.72
Item 5		3.89 (1.76)	0.52	.72
Item 7		4.10 (1.52)	0.38	.76
Item 10		4.33 (1.58)	0.58	.71
Item 14		4.12 (1.51)	0.46	.74
Item 18		4.25 (1.48)	0.55	.72
Total		24.69 (6.49)		

[a]Sample is the measurement of 275 participants in the first part.

TABLE 2 Correlation coefficients of the Multidimensional Health Locus of Control Scale A Form test-retest group

Sample[a]	Internal Control	Chance Control	Powerful Others	Internal Control (Repeat)	Chance Control (Repeat)	
Chance control	Correlation	−0.05	1			
	P value	.62				
Powerful other people	Correlation	0.38	0.21	1		
	P value	<.01	<.01			
Internal control (repeat)	Correlation	**0.67**	0.13	0.27	1	
	P value	**<.01**	.26	.01		
Chance control (repeat)	Correlation	0.04	**0.63**	0.10	0.13	1
	P value	.67	**<.01**	.35	.25	
Powerful other people (repeat)	Correlation	0.11	0.22	**0.77**	0.27	0.14
	P value	.33	.05	**<.01**	.01	.20
I-E Scale	Correlation	−0.24	0.40	0.18		
	P value	<.03	<.01	.12		

Bold emphasis in the Table 2 shows p values and the relationship between the sub-dimensions.
[a]Measurements of 75 people who participated both in the first part and the second part.

In test-retest reliability, the "internal" locus of control subdimensions had a significant, moderate, and positive correlation ($P < .01$; r: 0.67); the "chance" subdimensions had a significant, moderate, and positive correlation ($P < .01$; r: 0.63); and the "powerful others" subdimensions had a significant, high, and positive correlation ($P < .01$; r: 0.77) (Table 2).

3.3 | Validity

As a result of the confirmatory factor analysis of the MHLC Form A model, the following values were found: $P < .05$, $\chi^2/SD = 1.8$, RMSEA = 0.05, SRMR = 0.05, GFI = 0.92, AGFI = 0.9, NFI = 0.80, NNFI = 0.87, CFI = 0.89, PNFI = 0.68, and ECVI = 1.05 (Table 3). Acceptable values and acceptable fit were achieved for the model fit statistics, which consisted of three factors. No modification of this model was required.

When the standardized solution values in Figure 1 were analysed in order to interpret the error variances of the MHLC Form A, the lowest error value was found for the 10th item, at 0.50, and the highest error value was 0.95 for the eighth item.

When Figure 2 was analysed to interpret the t values of the MHLC Form A, it was determined that the lowest item value was 3.20 for the eighth item and the highest value was 12.1 for the 10th item.

4 | DISCUSSION

The original study for the development of the MHLC Form A was carried out at an airport in the United States and therefore included persons aged 16 to 69 years from different places in that country (Wallston et al., 1978). In this study, individuals aged between 20 and 69 who agreed to participate in the survey were included in the study. The difference between this study and the original study is that the age groups were set at 10-year intervals and that an equal number of individuals from each age group was included in the study.

This study determined statistics for the items in the MHLC Form A. The total correlation coefficient for the eighth item in the internal locus of control subdimension which contains the statement "When I get sick, I am to blame" was found to be low. Although the item correlation coefficient was low, it was above the critical value of 0.20 (Çatal, 2007). This statement requires a clear answer as to whom the result of an event is attributed. In a study conducted by Moshki, Ghofranipour, Hajizadeh, and Azadfallah (2007) on the validity and reliability of the MHLC Form Ain Iran, the total correlation coefficient of item 8 was found to be lower than the other items in the internal locus of control subdimension (except for the first item). In a study conducted by Ross, Ross, Short, and Cataldo (2015) in order to determine the psychometric properties of the MHLC Form A, the item with the lowest factor load within the internal control subdimension was the eighth item with 0.29. The results of research to determine the validity and reliability or psychometric properties of the MHLC Form A were found to be consistent with the results of this study.

The Cronbach α of the internal control subdimension identified in this study was slightly lower than the other subdimensions and the limit value. This situation arises from the eighth item in the internal control subdimension, which was interpreted in the discussion of the item statistics. The reliability of the internal control subdimension was below 0.70 (Kılıç, 2016) in all studies (Athale et al., 2010; Hashemian et al., 2014; Kuwahara et al., 2004; Moshki et al., 2007) except two studies (Ross et al., 2015; Wallston et al., 1978). The internal consistency coefficient for this study was found to be low for the internal control subdimension in sample 1 (0.66), while it was in the acceptable range for sample 2 (0.72) (Kılıç, 2016). This result provides the values needed for validity and reliability to be accepted when evaluated together with findings from other analyses for reliability.

TABLE 3 Fit indexes used in confirmatory factor analysis of Multidimensional Health Locus of Control Scale Form A

		Reference Fit Values[c]				
Queue No	Index Name	Weak Fit	Acceptable Fit	Perfect Fit	Value of the Study	Fit
1	*P* value[a]		*P* > .05	*P* > .05	<.05	Suitable[a]
2	χ^2/sd		Value < 5 Value < 3	Value < 3 Value < 2	1.8	**Perfect fit**
3	RMSEA	Value < 0.10	Value < 0.08	Value < 0.05	0.05	**Acceptable fit**
4	RMR	Value < 0.10	Value < 0.08	Value < 0.05	0.14	Not suitable
5	SRMR	Value < 0.10	Value < 0.08 Value < 0.10	Value < 0.05	0.05	**Acceptable fit**
6	GFI[b]	Value > 0.85	Value > 0.90	Value > 0.95	0.92	**Acceptable fit**
7	AGFI[b]	Value > 0.80	Value > 0.90 Value > 0.85	Value > 0.95 Value > 0.90	0.89	**Acceptable fit**
8	NFI[b]	Value > 0.85 Value > 0.80	Value > 0.90	Value > 0.95	0.80	**Weak fit**
9	NNFI[b]	Value > 0.85 Value > 0.80	Value > 0.90	Value > 0.95	0.87	**Weak fit**
10	CFI[b]	Value > 0.85	Value > 0.90	Value > 0.95	0.89	**Weak fit**
11	IFI[b]		Value > 0.90	Value > 0.95	0.89	Not suitable
12	RFI[b]		Value > 0.90	Value > 0.95	0.76	Not suitable
13	PNFI		Value > 0.50	Value > 0.95	0.68	**Acceptable fit**
14	ECVI[b]		No fixed range, Smaller is better	No fixed range, Smaller is better	1.05 (In the range of 0.91-1.21)	**Suitable**

Bold emphasis in the Table 3 shows whether it is suitable (perfect, acceptable or weak) of fit values.
[a]χ^2 is desired to be insignificant however it is generally significant (if there sample size is not large). For this reason, it is more appropriate to consider χ^2/SD.
[b]Takes a value between 0 and 1.
[c]For reference fit values: İlhan & Çetin, 2014; Çokluk, Şekercioğlu, & Büyüköztürk, 2014; Seçer, 2015; Şimşek, 2007.

In order to obtain further evidence of the reliability of the MHLC Form A, the correlations between the I-E Scale and the MHLC Form A were examined (Table 2). The internal control subdimension of the MHLC Form A and the I-E Scale had very weak and negative (Türüthan, 2009) correlation, and the chance subdimension and the I-E Scale had weak and positive (Türüthan, 2009) correlations. Since increasing scores in the I-E Scale show an increase in belief in an external locus of control, it is expected from the viewpoint of reliability that there will be a positive correlation between the I-E Scale and the chance subdimension and a negative correlation between the I-E Scale and the internal control subdimension. There is no relationship between the powerful others and the I-E Scale. In the original study to develop the MHLC Scale, the powerful others subdimension was included as part of the external locus of control. In this study, no such relationship was found in the analysis of the correlation between the powerful others and the I-E Scale.

There were different results between the subdimensions of the MHLC Form A in the original form of the study, in the literature, and in this study. This may be due to differences in age and education levels of the sample groups or in the culture and beliefs of the communities in which the samples are selected. The fact that there was a positive relationship between internal control subdimension and powerful others in this study and in some other studies (Athale et al., 2010; Kassianos, Symeou, & Loannou, 2016; Ross et al., 2015) and there was a positive relationship between chance and powerful others subdimensions in many studies (Athale et al., 2010; Hubley & Wagner, 2004; Kassianos et al., 2016) except the study of Wallston et al. (1978) does not support the assumptions that powerful others subdimension is covered by an external locus of control. Findings regarding the factor structure of these subdimensions confirm the structure that consists of separate scales. However, it is thought that cultural and belief differences should be taken into account when studying MHLC Form A and its subdimensions.

The test-retest method was not used in the reliability of the original study of the MHLC Form A (Wallston et al., 1978). The results of this study were found to be in the range of the acceptable values for the test-retest method (Türk et al., 2016). The results of the study were consistent with some other studies (Hubley & Wagner, 2004; Moshki et al., 2007).

To analyse the validity of the MHLC Form A, the findings about the confirmatory factor analysis of the structure were evaluated. There is no clear suggestion in the literature about which indexes should be used (apart from χ2/SD) (Çapık, 2014; İlhan & Çetin, 2014). The fit indices obtained from other studies are given in Table 4. When the literature is examined, it is seen that different fit index values are presented for different studies on the confirmatory factor analysis of

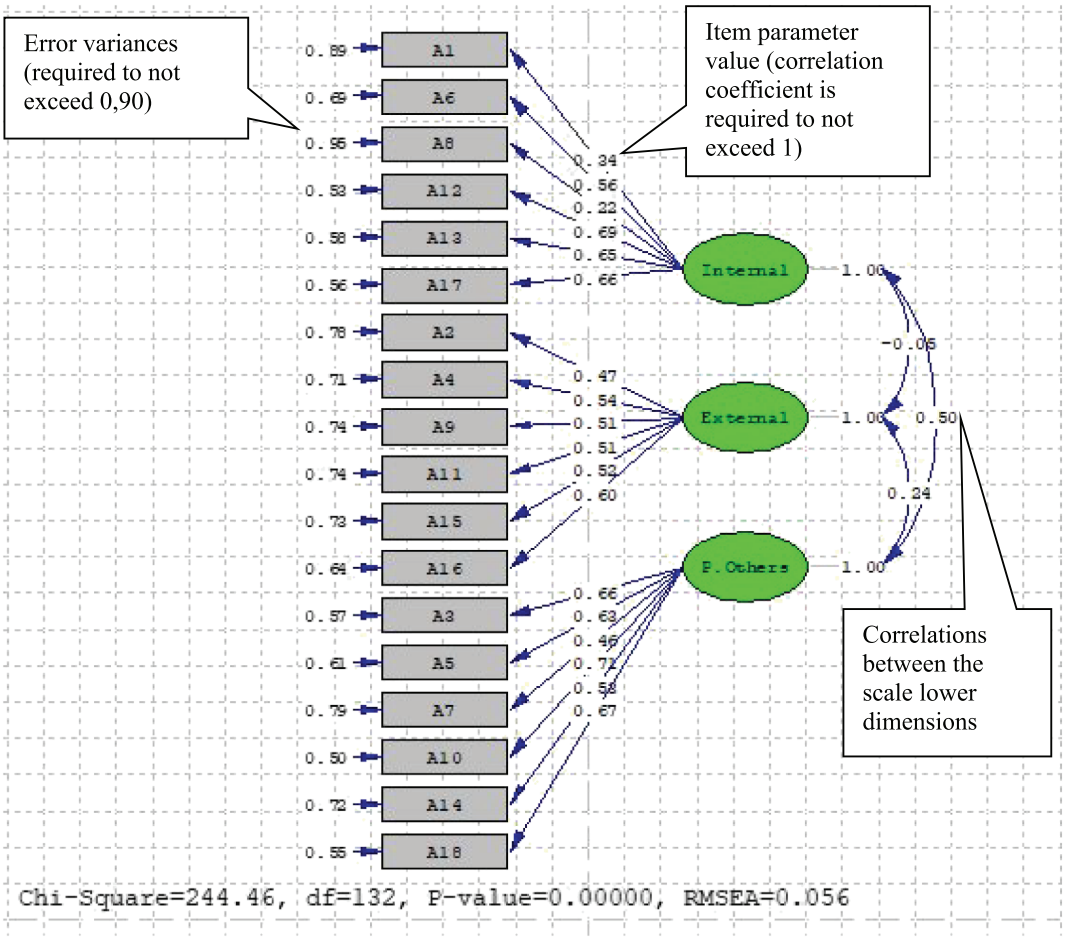

FIGURE 1 Confirmatory factor analysis of Multidimensional Health Locus of Control Scale Form A standardized analysis values

MHLC Form A. In one study, it is stated that the index values which are important for determining the confirmatory factor analysis are RMSE, SRMR, CFI, GFI, NFI, and NNFI (İlhan & Çetin, 2014). When the results of this study were examined, it was determined that the obtained values meet the acceptable values required to provide the fit statistics.

When the standardized solution values in Figure 1 were analysed for the interpretation of the error variances of the MHLC Form A (Seçer, 2015), the only item that had an error value higher than 0.9 was the eighth item. Although the error value of the eighth item was high, the *t* value was statistically significant (Seçer, 2015) (Figure 2); thus, it was decided to keep it in the model. When Figure 2 was analysed to interpret the *t* values of the MHLC Form A, it was found that all the item values were above 1.96 and statistically significant (Seçer, 2015). As a result of this research, it was found that the values obtained met the acceptable values required to provide the fit statistics.

In many studies in the literature and this study, a positive correlation was found between the internal control subdimension and the powerful others subdimension. This situation was not expected (in the original study, the external control subdimension is divided into two, chance control and powerful others). Different interpretations have emerged in studies in different cultures. In order to better understand the reasons for this, validity and reliability studies in different cultures should be performed taking into account variables such as age and gender.

The MHLC Form A has been used in many health intervention studies, including organizing a training programme to reduce cholesterol (Brown & Steele, 1999), determining the pain control perception of the elderly with chronic pain (Pereira, Araújo, Sampaio, & Haddad, 2011) and struggling against depression in the elderly with chronic diseases (Aflakseir & Mohammed-Abadi, 2016). In addition, the MHLC Form A has been used in many nursing studies, including investigating the effectiveness of treatment in patients with chronic low back pain (Keedy, Keffala, Altmaier, & Chen, 2014; Sengul, Kara, & Arda, 2010), assessing how schizophrenia patients and their first-degree relatives (caregivers) understand each other, and the therapeutic interventions used to help them (Thakral, Bhatia, Gettig, Nimgaonkar, & Deshpande, 2014), and analysing the success of family-oriented psycho-education (cognitive and behavioural) interventions (Goldbeck & Bundschuh, 2007). Demonstration of its validity and reliability in the Turkish translation is therefore important. Using the scale to measure the health locus of control of individuals or groups participating in

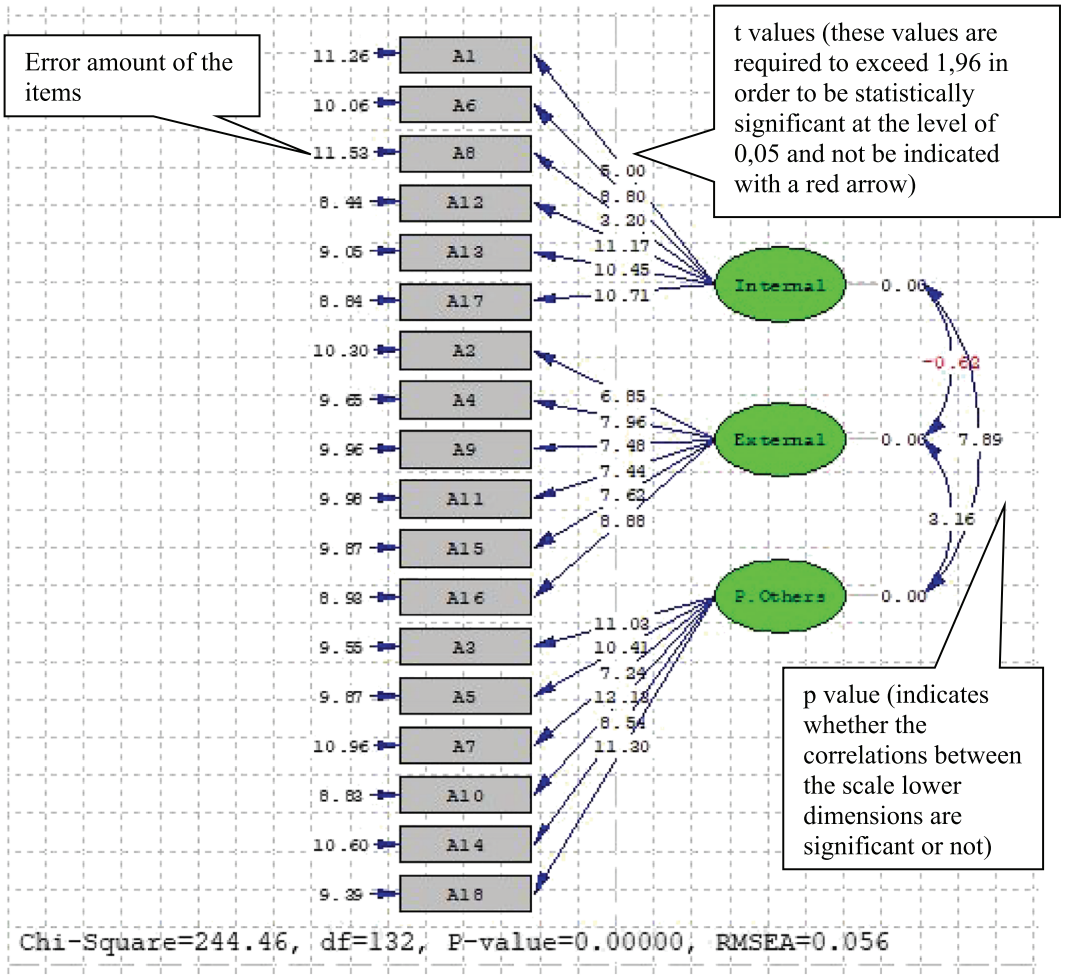

FIGURE 2 Confirmatory factor analysis of Multidimensional Health Locus of Control Scale Form A *t* values

TABLE 4 MHLC Scale Form A fit indexes obtained from this study and other studies after LISREL analysis

Fit Indexes	Wallston et al (Original Study)	Hubley and Wagner	Athale et al	Hashemian et al	Ross et al	Kassianos et al	This Study (Sample[a])
Research History	1978	2004	2010	2014	2015	2016	2017
P		<.001	<.001	.408	<.001	<.001	<.05
χ^2/SD		203.17	χ^2 = 544.62	1.03	460.90/132	314.04/132	1.8
RMSR		0.08					
SRMR			0.066		0.08	0.064	0.05
RMSEA		0.047	0.064	0.013	0.09	0.062	0.05
GFI		0.91				0.90	0.92
AGFI		0.89					0.89
NFI		0.80		0.98			0.80
NNFI		0.90					0.87
CFI				0.99		0.86	0.89
IFI				0.99			0.89
TLI				0.99			
CI					(90%) = 0.07-0.09		

[a]Measurements of 275 people who participated first part.

activities may enhance the effectiveness of health promotion and training.

4.1 | Limitations of the study

This study has some limitations in terms of research sample as well as the limitations of methodological research. The first limitation of the study is that the adaptation was only tested with a group living in Burdur which was selected by the researcher. Another limitation of the study is that it does not cover individuals under 20 or over 65 years old. In addition, the comments made by the experts about the scale were not evaluated with content validity (CVI) as only four experts were consulted.

On the other hand, this validity and reliability study is based on the findings from the general population (the primary group in health locus of control studies) aged 20 to 69 years, and it is hoped that it will be beneficial for future studies.

5 | CONCLUSION

The findings obtained in this study for the adaptation of MHLC Form A to Turkish have been evaluated together with those of previous studies. When the validity and reliability analyses of the MHLC Form A in Turkish were examined, values that can be accepted as valid and reliable for the selected sample group (the general population between the ages of 20 and 69) were obtained. The use of the health locus of control scale can be continued with confidence in training and intervention studies on health issues.

CONFLICT OF INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

AUTHORSHIP STATEMENT

All authors have contributed significantly to the writing of the manuscript, and all authors are in agreement with its content. Study design: Sarp Üner, Aysun Güzel; Data collection and analysis: Aysun Güzel, Sevgi Turan; Manuscript writing: Aysun Güzel, Sarp Üner, Sevgi Turan.

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