

Original Article

## Turkish Validity and Reliability Study of the HIV Treatment Knowledge Scale

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### Abstract

**Background:** Developed by Balfour et al. In 2007, the 'HIV Treatment Knowledge Scale' is a very high measure of validity and reliability of 21 items developed to determine the knowledge level of HIV patients, health personnel and the community

**Objectives:** This study was conducted to adapt the 'HIV Treatment Knowledge Scale' into Turkish and assess its validity and reliability

**Methods:** The population of the methodological study consisted of 560 nurses working at a university hospital in Turkey between November 2016 and June 2017. The sample, on the other hand, consisted of 210 nurses, who agreed to participate in the study, from the mentioned population. Following the translation process of the scale; content and construct validity was performed. The content validity index was calculated after receiving the expert opinions. While the exploratory factor analysis was performed for the construct validity, item analyses and internal consistency analysis were performed for the reliability.

**Results:** As a result of evaluations and analyses, it was determined that the HIV Treatment Knowledge Scale could be used unidimensionally. Total mean score of the scale was determined as  $9.65 \pm 4.65$ . It was found that the content validity index of the scale was .99 and total Cronbach's alpha coefficient was 0.80.

**Conclusion:** The results of the study revealed that the HIV Treatment Knowledge Scale had a very high validity and reliability and could be used in Turkey.

**Keywords:** AIDS, HIV, treatment, validity, reliability

### Introduction

HIV is a terminal illness that may affect people from all ages, has not been definitely treated and has great side effects and economic burdens. However, the illness can be kept under control with early diagnosis and an efficient treatment and turn into a chronic illness requiring lifelong drug use and treatment (Tumer and Unal, 2001,

Positive Life Association, 2007, Mo and Ng, 2017, Vorasane et al., 2017)

According to the UNAIDS 2016 report of the United Nations HIV/AIDS Joint Program; it is stated that approximately 2 million people got infected with HIV in 2016 in the world, there were 36.9 million HIV carriers and 1,2 million people passed away because of AIDS(UNAIDS, 2017) Turkey is considered among the countries

where HIV/AIDS is seen less frequently in the world. In Turkey, the total number of cases with reported HIV/AIDS has been 131.81 since 1985 until today. It is stated that cases are seen mostly in the age range of 20-49 years and 70% of them are male. It is also stated that 52% of the cases get infected sexually and 1.9% due to intravenous substance abuse. On the other hand, the cause of transmission is not known 44% of cases (Hacettepe University HIV / AIDS Treatment and Research Center (HATAM), 2016, Turkey Ministry of Health, 2011) However, since people do not apply consciously and wistfully to health institutions in sexually transmitted infections in Turkey, there is high possibility of presence of unrecorded patients, and also HIV infection has an asymptomatic period of approximately 8-10 years and the diagnosis can be established only through the laboratory test; all of which make us think that the aforementioned rates are considerably lower than the actual rates (Turkey Ministry of Health, 2011)

In the literature, it is reported that one of the reasons for the increase in number of cases infected with HIV is that community, healthcare personnel and patients with HIV have low knowledge and awareness level regarding HIV/AIDS (Ananth and Koopman, 2003, Balfour et al., 2007, Gupta et al., 2016, Prinsloo et al., 2016, Wolf et al., 2005) Therefore, it becomes more and more important to evaluate the transmission routes, diagnosis and treatment knowledge of HIV/AIDS and the ways to protect from the illness appropriately in studies. In the study conducted by Kaya et al., (2007) to examine the knowledge and attitudes of health school students regarding HIV/AIDS, it was determined that students did not have sufficient knowledge and had negative and contradictory attitudes towards patients with HIV/AIDS (Kaya et al., 2007) In their study, Dayapoglu and Kiyak (2008) determined that nurses had insufficient knowledge and attitudes regarding AIDS and it was required to organize in-service training programs to increase their levels of knowledge on this subject (Dayapoglu and Kiyak, 2008) In the study conducted by Cekin et al., (2013) to investigate the knowledge and behaviors of healthcare professionals at a tertiary hospital regarding HIV, it was found that hospital staff had moderate level of knowledge regarding HIV/AIDS (Cekin et al., 2013) When examining these studies conducted in Turkey; it is seen that researchers have used different questionnaires

prepared by themselves in accordance with the literature for determining the level of knowledge and awareness regarding HIV/AIDS instead of a specifically developed scale (Avcikurt, 2014, Cekin et al., 2013, Dayapoglu and Kiyak, 2008, Kaya et al., 2007, Kurt and Yimaz, 2012, Ozdemir et al., 2006). Developed by Balfour et al., in 2007; the 'HIV Treatment Knowledge Scale' is a 21-item scale with a very high validity and reliability designed for determining the knowledge levels of patients with HIV, healthcare personnel, and community (Balfour et al., 2007) It is aimed to use this scale in determining the knowledge levels of nurses for the purpose of translating it into Turkish and conducting its validity and reliability. The scale will provide an opportunity for determining the deficiencies on this subject and providing necessary in-service trainings.

**Objective:** The study was conducted to evaluate the Turkish validity and reliability of the HIV Treatment Knowledge Scale developed for assessing the knowledge levels of nurses regarding HIV.

#### **Material and Method**

**Time and Place of the Study:** The study was conducted based on methodological research model. It was conducted with nurses working at a university hospital in Turkey between October 2016 and June 2017.

**The Population and Sample of the Study:** While the population of the study consisted of 560 nurses working at a university hospital between October 2016 and March 2017; the sample consisted of 210 nurses, who agreed to participate in the study, from the mentioned population. It is recommended to reach a group at least 5-10 times greater than the number of scale items in adaptation of a scale into another culture (Gozum and Aksayan, 2002) As the number of scale items was 21, it was found sufficient to reach 210 nurses in the study.

#### **Data Collection Tools**

**Personal Information Form:** Personal Information Form was prepared under the guidance of the relevant literature (Avcikurt, 2014, Balfour et al., 2007, Cekin et al., 2013, Dayapoglu and Kiyak, 2008, Kaya et al., 2007, Kurt and Yimaz, 2012, Ozdemir et al., 2006). The form consisted of 5 questions for determining the demographic characteristics of

the nurses (age, gender, graduation school, working duration, clinic).

**HIV Treatment Knowledge Scale:** was developed by Balfour et al., in 2007 for determining complex treatment subjects like drug resistances, side effects and addiction (Balfour et al., 2007) The Scale consists of 21 items. It is a three-point Likert scale. Each Likert represents the answer 'true', 'false', and 'undecided'. Total score is calculated by dividing the number of correct answers into scale items. Higher scores signify higher HIV treatment knowledge level. The Cronbach's alpha coefficient of the scale is 0.90. In this study, the Cronbach's alpha reliability coefficient was determined as 0.80.

**Data Collection:** After the researchers made necessary explanations to the nurses, the data collection forms of the study were distributed and the nurses filled them. It took approximately 10-12 minutes for the nurses to complete the Personal Information Form and the HIV Treatment Knowledge Scale. Seven expert opinions were received to determine the language validity of the HIV Treatment Knowledge Scale. On the other hand, the reliability was determined using the test-retest reliability method for two weeks during the data collection process(Gozum and Aksayan, 2002)

### Validity Findings of the HIV Treatment Knowledge Scale

**Language Validity:** The validity study of the HIV Treatment Knowledge Scale was conducted first in order to adapt the scale into the Turkish society. The HIV Treatment Knowledge Scale was translated from English to Turkish firstly by the researcher and then two academic members. The scale that was translated into Turkish was reviewed by the researcher and turned into a single form. Then, these forms that were translated into Turkish were translated back by an English linguist who knows both cultures very well and has a good command of both languages. The original scale and the scale translated into Turkish were compared and it was determined that there was no meaning change in scale items. Translations that were available in both scales and expressed each item ideally were selected and presented to the expert opinion of 7 people according to suggestions.

**Content Validity:** The Content Validity Index-CVI was used for proving both language and culture equivalence of items and content validity via numerical values and evaluating the expert

opinions healthily. Experts were asked to describe each item in the scale selecting one of the expressions: "4=Completely appropriate", "3=Highly appropriate", "2=Appropriate but requires minor changes in statements", "1=Not appropriate" and rate each scale item by scoring them between 1-4. The result of Content Validity Criterion (CVC)/Content Validity Index (CVI) was determined as 0.99. Accordingly, the content validity of the scale was found to be statistically significant. Thus, none of the items were omitted from the scale(Gozum and Aksayan, 2002)

**Data Assessment:** The data obtained in the study were analyzed using the statistical packaged software (SPSS) 17.0 and LISREL 8.8 package. In the data analyses; the information obtained from Personal Information Form regarding the patients included in the study were evaluated via number and percentage. Regarding the validity study; content and construct validity was determined by using expert opinions, Bartlett's Tests, Kaiser-Meyer-Olkin Index (KMO), Exploratory Factor Analysis, Confirmatory Factor Analysis, and Principal Component Analysis. Regarding the reliability study; internal consistency and homogeneity were determined using the Cronbach's alpha Coefficient, SpearmanRho Correlation analysis and Item-total score correlation.

**Ethical Considerations of the Study:** Written permission was obtained from the author of the scale for Turkish Adaptation of the HIV Treatment Knowledge Scale used in the study. An approval dated 30/11/2016 and numbered 2016-11/7 was obtained from the Ethics Committee of Atatürk University Faculty of Health Sciences and official written permissions were received from the hospital where the study was conducted.

### Results

The age average of the nurses participating in the study was  $27.93 \pm 6.81$ . 88.1% of the nurses were female, 48.1% were undergraduate/college graduate and 49.5% were working for 5 years and above. 35.2% of the nurses were working in surgical clinics. Mean score obtained by the nurses from the HIV Treatment Knowledge Scale was  $9.65 \pm 4.65$

**Reliability Findings of the HIV Treatment Knowledge Scale:** As is seen in Table 1; the Cronbach's  $\alpha$  coefficient and item-total score correlation coefficients were evaluated to

determine the internal consistency and homogeneity of the HIV Treatment Knowledge Scale. It was determined that the Cronbach's  $\alpha$  coefficient of the scale was 0.80 and item-total score correlation coefficients varied between 0.30 and 0.55. As is seen in Table 2; the test – retest

correlation value of the scale was 0.827, which was found to be statistically significant as a result of the analysis. The value showed that there was a strong correlation between two measurements and the measurements had similar results (Capik, 2014)

**Table 1. Scale Items, Mean Values, Item-Total Correlation and the Cronbach's  $\alpha$  Values if the Item is Deleted**

Item No	n	Mean	SD	Item-Total Correlation	Cronbach's $\alpha$ if the Item is Deleted
1	210	0.47	0.50	0.405	0.793
2	210	0.49	0.50	0.306	0.798
3	210	0.44	0.50	0.315	0.798
4	210	0.53	0.50	0.326	0.797
5	210	0.43	0.50	0.344	0.796
6	210	0.50	0.50	0.402	0.793
7	210	0.60	0.49	0.551	0.785
8	210	0.48	0.50	0.324	0.797
9	210	0.48	0.50	0.466	0.789
10	210	0.39	0.49	0.376	0.794
11	210	0.40	0.49	0.333	0.797
12	210	0.51	0.50	0.320	0.798
13	210	0.47	0.50	0.314	0.798
14	210	0.28	0.45	0.333	0.797
15	210	0.66	0.47	0.392	0.794
16	210	0.37	0.48	0.346	0.796
17	210	0.50	0.50	0.344	0.796
18	210	0.32	0.47	0.322	0.797
19	210	0.44	0.50	0.322	0.797
20	210	0.60	0.49	0.373	0.795
21	210	0.61	0.49	0.346	0.796
Cronbach's $\alpha$				<b>0.803</b>	

**Table 2. Results of the Test -Retest SpearmanRho Correlation Analysis**

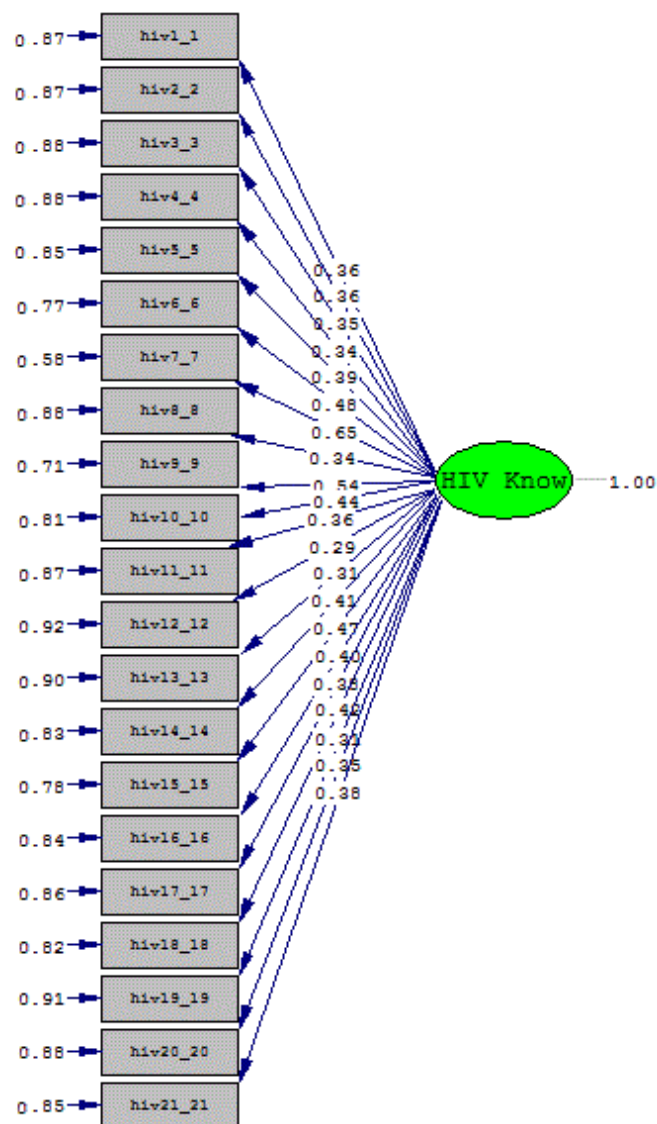
Tests		First Test	Retest
Pretest	$r$	1.000	<b>0.827</b>
	$p$	-	<b>0.000</b>
Posttest	$r$	0.827	1.000
	$p$	0.000	-

**Table 3. The KMO and Bartlett's Test Values of the Scale Items**

Value of KMO		0.748
Value of Bartlett's Test	$\chi^2$	902.318
	SD	210
	P	0.000

**Table 4 Results of the Confirmatory Factor Analysis for the HIV Treatment Knowledge Scale**

Index	Found	Appropriate	Acceptable
$\chi^2/SD$	1.73	<2	<5
RMSEA	0.059	<0.05	<0.08
CFI	0.90	>0.95	>0.90
RMR	0.02	<0.05	<0.08
SRMR	0.07	<0.05	<0.08
GFI	0.93	>0.95	>0.90
AGFI	0.91	>0.95	>0.90
NFI	0.80	>0.95	>0.90



Chi-Square=313.41, df=181, P-value=0.00000, RMSEA=0.059

**Figure 1. PATH Diagram Regarding the Factor Structure of the Scale**

**Factor Analysis:** In order to obtain more explicit findings in the study, the factor analysis was carried out to determine the construct validity of the HIV Treatment Knowledge Scale. Before the factor analysis, the *KMO* (Kaiser-Mayer Olkin) analysis was used for determining whether or not the sample size was adequate. The Bartlett's Test was performed for determining the convenience of the data for the factor analysis. Exploratory Factor Analysis (*EFA*) and Confirmatory Factor Analysis (*CFA*) were used for evaluating the factor structure of the scale. Table 3 shows the *KMO* and Bartlett's Test values of the scale items.

When examining Table 3; it was seen that the value of *KMO* was 0.748. The value of Bartlett's Test, on the other hand, is  $\chi^2=902.318$ ,  $p=0.000$ . These findings showed that the data were interrelated and the data set was appropriate for the factor analysis.

#### Findings of Exploratory Factor Analysis

Exploratory Factor Analysis was conducted to decrease the number of variables and reveal some new structures by using the correlation between variables (Akgul, 2005). The factor loads of items in the HIV Treatment Knowledge Scale varied between 0.379 - 0.664. It was observed that The HIV Treatment Knowledge Scale which has a unidimensional structure in the original language also maintained a unidimensional structure in the Turkish form.

When examining the Turkish form of the HIV Treatment Knowledge Scale unidimensionally as a result of the Confirmatory Factor Analysis, it was determined that the factor loads varied between 0.379 - 0.664 and the total variance was 20.617%. As the factor loads of all items were above 0.30 in this stage, no item was omitted from the scale

In the tests conducted for examining the fit of the model of the scale, the index values were determined as;  $\chi^2/SD$  value 1.73, *RMSEA* 0.059, *CFI* 0.90, *RMR* 0.02, *SRMR* 0.07, *GFI* 0.93, *AGFI* 0.91 and *NFI* 0.80. As a result of the relevant fit index values, it was agreed that the model was fit in that way. Thus, the Turkish version of the 21-item HIV Treatment Knowledge Scale with single subscale requires no change in respect to the original version (Table 4) (Capik, 2014).

The factor structure obtained as a result of the Confirmatory Factor Analysis regarding the

items of the HIV Treatment Knowledge Scale is presented as PATH Diagram in Figure 1. All results have showed that the scale is valid and reliable in the Turkish language.

#### Discussion

In Turkey, there has been no specific scale evaluating the knowledge levels of nurses regarding HIV. For this purpose, the Turkish validity and reliability study of the HIV Treatment Knowledge Scale was conducted. The findings regarding the 21-item HIV Treatment Knowledge Scale are discussed in this section.

The total Cronbach's alpha coefficient of the scale was determined as 0.80 in this study and 0.90 in the study by Balfour et al., (2007). These results have showed that the HIV Treatment Knowledge Scale is a highly reliable tool for measuring the knowledge levels of nurses.

Test-retest reliability method was used for testing the determination of the HIV Treatment Knowledge Scale. It was determined that the test-retest correlation value of the scale was 0.82 and the analysis was statistically significant. Balfour et al., (2007) also used the test-retest reliability method in their study and found that the test-retest correlation value was 0.83 and the analysis was statistically significant. These findings have showed that the HIV Treatment Knowledge Scale is highly reliable.

In this study, it was determined that the factor loads of all items varied between 0.37 - 0.66. In the study by Balfour et al., (2007), on the other hand, it was reported that the factor loads of all items varied between 0.36 and 0.69. These results have showed that the factor loads of scale items are adequate.

In the Turkish adaptation study of the scale, the rate of variance explained was found as 20.6%. In their study, Balfour et al., (2007), on the other hand, found the rate of variance explained as 32.9% in the original form of the scale. In accordance with these findings, it was determined that the factor structure of the HIV Treatment Knowledge Scale was adequate as in the original scale. Index values applied for determining the fit of the model of the scale were determined as;  $\chi^2/SD$  value 1.73, *RMSEA* 0.059, *CFI* 0.90, *RMR* 0.02, *SRMR* 0.07, *GFI* 0.93, *AGFI* 0.91 and *NFI* 0.80. As a result of the relevant fit index values, it was agreed that the model was at the acceptable level in that way. Therefore, the Turkish form of the 21-item HIV

Treatment Knowledge Scale with single subscale required no change in respect to the original form.

### Conclusion and Recommendations

According to the results obtained from the study conducted for bringing the Turkish form of the HIV Treatment Knowledge Scale in the literature:

- There was no dissensus among the experts regarding the fit reliability criterion between content validity and independent observers and the scale items translated into Turkish, and according to this result, the scale is applicable to the Turkish culture,
- When examining the item-total score correlations of scale items; a statistically significant correlation was determined between the items and the scale and thus, none of the items were omitted from the scale. According to this result, it was seen that each item had a usable reliability,
- And the scale had a high internal consistency reliability coefficient for the sample group, which means that each item of the scale represents the scale.

Consequently; it can be recommended to determine the knowledge levels of nurses by applying the HIV Treatment Knowledge Scale to them and provide in-service trainings in order to contribute to the successful management of the illness. It is also recommended to apply the HIV Treatment Knowledge Scale in different groups.

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