

# Developing the Attitude Scale Toward People Living with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) for University Students

## Abstract



**Aim:** This research was conducted to develop Attitude Scale toward People Living with Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS), which would determine university students' attitudes toward people living with HIV/AIDS.

**Methods:** This methodological research was carried out at Ankara Yıldırım Beyazıt University between October 2017 and June 2018. The 25-item draft scale created in line with literature was applied to 286 students from different departments. Cronbach Alpha value was used for reliability analysis. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed to analyze construct validity. Test-retest reliability coefficient was evaluated by Pearson Correlation and dependent-samples *t*-test. Independent-sample *t*-test, one-way ANOVA, and Kruskal-Wallis tests were used to analyze data on students' attitude scores.

**Results:** As a result of AFA, structure with 4 sub-dimensions and 18 items were obtained. This structure explained 59.83% of total variance. Cronbach's alpha value of the scale was calculated as 0.85. Compliance index values for the CFA results were NFI = 0.94, NNFI = 0.96, IFI = 0.97, CFI = 0.97, RMSEA = 0.060, GFI = 0.91, AGFI = 0.87, SRMR = 0.089. In test-retest reliability analysis, it was determined that scale gave similar results in repeated measurements at different times ( $r = 0.783, P < .001$ ).

**Conclusion:** This scale was determined to be a valid and reliable measurement tool in determining university students' attitudes toward people living with HIV/AIDS.

**Keywords:** HIV, AIDS, Attitude, Scale development

Erdal Ceylan   
Ayşegül Koç 

Department of Nursing, Ankara Yıldırım Beyazıt University  
School of Health Sciences, Ankara, Turkey

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Corresponding Author: Erdal Ceylan  
E-mail: erdalcyn.ec@gmail.com

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## Introduction

The World Health Organization estimates that there are 37.9 million people worldwide are living with HIV/AIDS in the world, with 36.2 million being adults and 18.8 million being women.<sup>1</sup> In Turkey, the number of new cases is also increasing. From 1985, when the first case was seen, to November 15, 2021, 29.284 HIV-positive people and 2052 AIDS patients were reported. Between January 01, 2021, and November 15, 2021, 2021 HIV (+) and 53 new AIDS cases were diagnosed.<sup>2</sup> Although there is no permanent cure that completely eliminates HIV infection, antiretroviral therapy (ART) can be used to prevent HIV related complications.<sup>3,4</sup> The widespread use of ART in the treatment of HIV/AIDS has resulted in a reduction in the global incidence of HIV/AIDS-related mortality.<sup>5</sup>

HIV/AIDS is widely acknowledged to be one of the most stigmatizing diseases in recent history.<sup>6</sup> People living with HIV/AIDS (PLWHA) are still stigmatized, condemned, and feared by governments, communities, health care providers, employers, family members, and colleagues.<sup>7</sup> The most important reasons for this are the high incidence of the spread of the disease, the high incidence of death, and the lack of an effective treatment/vaccine to cure the disease.<sup>6</sup> Furthermore, the widespread belief in society that HIV/AIDS is associated with behaviors such as homosexuality, drug use, sex work, and promiscuous sexual relations, as well as widespread misinformation about how HIV/AIDS is transmitted, are among the causes of the negative reactions experienced by people living with HIV/AIDS (PLWHA).<sup>8,9</sup> These reactions and approaches cause PLWHA to be exposed to negative attitudes such as fear, silence, violence, denial, and stigma.<sup>6</sup> Such negative attitudes can lead to rejection from the family and society, mistreatment in health and educational institutions, loss of rights, and psychological problems.<sup>10,11</sup>

The approaches and behaviors of society and people are shaped by the attitudes they have. Attitude is a mental, emotional, and behavioral reaction predisposition that an individual organizes based on experience, knowledge, emotions, and motives (motivation) toward himself/herself or any object, social issue, or event in his/her environment.<sup>12</sup> Attitude, which influences both social perception and behavior, is composed of three components; cognitive, affective, and behavioral components.<sup>13</sup> Accordingly, what people know about a subject (mental element) determines how they will approach (positive, negative, neutral) and behave toward that subject (behavioral element).<sup>12</sup>

Various studies have found that there is a generally negative attitude toward PLWHA. Kanoa et al.<sup>14</sup> found that stigma and discriminatory attitudes toward PLWHA were high among students in a study conducted with 492 university students to evaluate HIV/AIDS attitudes in Gaza. More than half of these students believed that PLWHA should not have the right to work, one-third did not want to work in the same environment and two-thirds were unwilling to contact and communicate with PLWHA.<sup>14</sup> According to the studies of Maimaiti et al.<sup>15</sup> and

Haroun et al.<sup>16</sup>, which examined students' attitudes toward PLWHA, it was reported that approximately 70% and 85% of students, respectively, had negative attitudes. Dong et al.<sup>17</sup> also stated that discriminatory attitudes and behaviors such as HIV testing without obtaining consent from patients, treat PLWHA differently from other patients, disclosing patients' information and refusing to treat PLWHA are common among healthcare professionals.

Attitudes toward PLWHA were not measured using a standard attitude scale with validity and reliability in studies conducted in our country, including the study conducted by Maimati et al.<sup>15</sup> in Konya; instead, questionnaire forms prepared by researchers containing attitude items toward PLWHA were used. As a result, it is clear that there is a need to develop an appropriate measurement tool with validity and reliability in order to assess university students' attitudes toward PLWHA in Turkey.

Determining the attitudes toward PLWHA aids in determining university students' cognitive, affective, and behavioral reactions to these individuals. Various studies have revealed that PLWHA face numerous ethical issues and are exposed to negative attitudes in social life, health care, business life, laws, and the media.<sup>18-20</sup> For this reason, it is critical to develop appropriate measurement tools with validity and reliability to assess university students' attitudes toward PLWHA. However, when the Turkish literature was examined, it was discovered that there was no measurement tool that could evaluate university students' attitudes toward PLWHA at the time of our study, and the current measurement tools, whose validity and reliability had been established, were not up-to-date. In this regard, the goal was to create a measurement tool to determine university students' attitudes toward PLWHA. This research was planned to develop the "Attitude Scale Towards People Living with HIV/AIDS", which would assess university students' attitudes toward PLWHA. Our study is expected to contribute to the HIV/AIDS literature by providing a reliable, valid, and up-to-date scale that can be used by various professional groups, particularly nurses, working in this field.

### Research Question

Is the Attitude Scale toward People Living with HIV/AIDS developed by researchers a valid and reliable tool for determining university students' attitudes?

## Method

### Type of Research

This research is a methodological study that was carried out to develop the "Attitude Scale toward Individuals Living with HIV/AIDS" for university students.

### Location and Time of Study

The study was carried out at Ankara Yıldırım Beyazıt University (AYBU) between October 2017 and June 2018.

### Population and Sample of the Study

The universe of the study consisted of students studying at AYBU Faculty of Health Sciences, School of Foreign Languages (preparatory students), Faculty of Medicine, Faculty of Law, Faculty of Islamic Sciences and Faculty of Engineering. In the study, the random sampling method (convenience sampling) was used, and the students who agreed to participate in the study from the specified departments were included in the sample of the study.

There is a general rule in scale development studies that the number of samples to be included in the study should be 5-10 times the number of items in the prepared scale.<sup>21</sup> Given that the scale prepared for our

study consisted of 25 items, we hoped to reach at least 250 people in total. However, because participation in the study was voluntary and some students may not want to participate, it was planned to reach 390 students in total by including 65 students from each department. Students from the Department of Nursing, the Faculty of Law, the Faculty of Engineering, the Faculty of Islamic Sciences, the Faculty of Medicine, and the School of Foreign Languages whose courses were appropriate for completing the questionnaires were included in the study, in departments where permission for the study was obtained. We surveyed 300 students from the specified faculties who agreed to participate in our research. Prior to data analysis, however, the missing and incorrect values in the completed questionnaires (n = 300) were checked, and questionnaires with an empty item were excluded from the study. In this context, 14 questionnaires were excluded from the study. As a result, the study included data from 286 participants. A preliminary test was conducted with 20 students who were not part of the sample group for the validity and reliability studies. Aside from that, 15 days after the scale items were applied to the sample group, 30 students chosen at random from the 286 students who participated in the study were asked to fill out a questionnaire. Thus, test-retest analysis was carried out.

Of the study group; 21.3% (n = 61) are Nursing students (3rd grade), 18.9% (n = 54) are School of Foreign Languages students (preparatory students), 18.2% (n = 52) are Law students (1 and 2nd grade), 17.8% (n = 51) are Engineering students (2nd, 3rd, and 4th grade), 17.1% (n = 49) are Islamic Sciences students (3rd grade), and 6.6% (n = 19) are Medicine students. While students from the Department of Nursing had the highest rate of participation in the study, the participation rate of the students from the Faculty of Medicine remained low.

### Data Collection Instruments

Data were collected using a self-developed questionnaire form that included 10 questions about the demographic data and HIV/AIDS characteristics, as well as the Attitude Scale toward People Living with HIV/AIDS, a 25-item draft scale.

### Scale Development Process

#### Scale Item Preparation

Initially, the relevant literature was searched in order to develop the Attitude Scale toward People Living with HIV/AIDS for university students.<sup>14,22-28</sup> The phrases that can be used in the scale were investigated by reviewing the studies in the literature. When developing the scale's phrase list, cognitive, affective, and behavioral sub-components of attitude were taken into account. As a result, an item list of 50 items in total, including cognitive, affective, and behavioral, were created.

### Obtaining Expert Opinions/Content Validity Index (CVI)

The items on the created scale were reviewed by a total of eight experts, including six from nursing, one from medicine, and one from Turkish fields. Experts assessed each scale item in terms of its ability to represent the feature to be measured as well as its intelligibility. As a result, for each scale item, they chose one of the following options: "(a) The item represents the feature, (b) The item requires some correction, (c) The item requires extensive correction, or (d) The item does not represent the feature." The Davis method technique was used to assess content validity. As a result, the content validity index (CVI) for each item was calculated by dividing the number of experts who chose options (a) and (b) by the total number of experts. The CVI values of the draft scale items ranged between 0.75 and 1.00, mean CVI was 0.95. Some of the items that were not understood, had similar meanings, contained more than one judgment, and were not meant to measure

attitude were corrected, and some items were removed entirely, according to expert opinions. As a result, a 25-item final scale form was developed, with two items on the cognitive component, nine on the affective component, and 14 on the behavioral component. 13 of the items contain positive statements and 12 of them contain negative statements. Scale items were prepared as a 5-point Likert-type scale (1 - Strongly Agree, 2 - Agree, 3 - Undecided, 4 - Disagree, 5 - Strongly Disagree). Responses of the positive statements in the scale were recoded in the opposite direction between “Strongly Agree: 1” and “Strongly Disagree: 5”. In the 25-item draft scale, the numbers of positive items are 1, 2, 5, 8, 9, 10, 14, 17, 18, 20, 21, 23, and 24. Negative items are 3, 4, 6, 7, 11, 12, 13, 15, 16, 19, 22, and 25. As the score obtained from the scale increases, students’ attitudes toward PLWHA increase positively.

### Data Collection

Following the necessary corrections to the scale items in accordance with the opinions and suggestions received from the experts, a preliminary test with 20 students was conducted to determine the scale’s usability. As a result of the preliminary test, two questions that were difficult to understand in the questionnaire form were revised. The study’s application phase then began, and data were collected by administering questionnaires to students between October 2017 and June 2018. The questionnaires were administered to the students in their classrooms under observation. Because the study was a scale development study, the importance of reading the statements on the scale carefully and correctly marking what they thought for each question was stressed, and those who agreed to participate in the study were given questionnaires to complete. The same draft scale was applied to 30 randomly selected students out of 286 students who participated in the study using the same method 15 days after the first application, and thus the test-retest phase of the study was carried out.

### Ethical Issues

Ethics committee approval required for the study was obtained from Ankara Yıldırım Beyazıt University (AYBU) Ethics Committee (Date and Number: 10.05.2017-37). To conduct the research questionnaires, written permission was obtained from the deans and directors of Ankara Yıldırım Beyazıt University’s Faculty of Health Sciences, School of Foreign Languages, Faculty of Medicine, Faculty of Law, Faculty of Islamic Sciences, and Faculty of Engineering. After being informed about the research’s purpose, significance, and data collection forms, participants were informed that there would be no information about their personal information on the questionnaire and that no one other than the researchers would have access to these questionnaire answers. The prepared informed consent form was read to the participants, and it was explained that participation in the study was entirely voluntary. The data collection form and scale form were then applied only to students who volunteered to participate in the study.

### Data Analysis

The scale’s positive statement scores were reversed and recoded in the opposite direction. In this way, those who participated in positive items received high scores, while those who participated in negative items received low scores. The construct validity of the scale was determined using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). SPSS 22.0 (IBM SPSS Corp.; Armonk, NY, USA) package program was used for EFA. Kaiser-Meyer-Olkin (KMO) and Barlett tests were used to test whether the data were suitable for factor analysis. After determining the suitability of the data for factor analysis, EFA was performed using Principal Components Analysis and varimax rotation technique to determine the construct validity of the

scale. It was demonstrated in EFA how many factors the scale contained and which factors the scale items were collected in. To test the suitability of the structure revealed by EFA, CFA was performed using the LISREL 9.2 program. The Cronbach-Alpha reliability coefficient was used to determine the scale’s reliability. The Cronbach Alpha reliability coefficient was calculated separately for the scale and the scale’s sub-dimensions. Pearson correlation analysis and dependent sample *t*-test were used to examine the consistency between the scale total score and the scale sub-dimension scores of 30 students who were retested after the first application and the second application 15 days later. Furthermore, the Independent Samples *t* Test, One Way ANOVA, and Kruskal-Wallis tests were used to determine whether there was a difference in attitude scores toward PLWHA based on the independent variables (gender, department, economic status, HIV/AIDS education and knowledge of HIV transmission routes).

## Results

### Construct Validity: Exploratory Factor Analysis (EFA)

The KMO value was 0.833, and the Barlett Test value was 1900.213, both of which were found to be significant as  $P < .001$  in the analysis performed to determine whether the scale was suitable for factor analysis. (Table 1). In this context, it can be said that the data are from a multivariate normal distribution and that the variables have a sufficient relationship for factor analysis. After determining that the Attitudes toward People Living with HIV/AIDS Scale was suitable for factor analysis, an exploratory factor analysis of 25 items from the scale was performed to assess the structural validity of the scale. Principal Components Analysis and Varimax rotation method were used for factor analysis. In principal component analysis, the Varimax rotation technique was used, and a 5-factor structure with an eigenvalue greater than 1.00 was obtained. 7 items that did not load any factor, had a factor load of less than 0.50<sup>29,30</sup> loaded more than one factor and were not clear to which factor they belonged were removed from the scale in order. After removing these items from the scale, the factor loads were re-examined by rotating them. As a result, 7 items were removed from the draft scale, and the scale was reduced to 18 items in its final form. The scale, which had five sub-factors in the first factor distribution, was eventually shaped with 4 sub-factors. These four sub-factors explain 59.83% of the total variance of the scale. Accordingly; the first factor consists of eight items with factor loads ranging from 0.781 to 0.548; the second factor consists of five items with factor loads ranging from 0.821 to 0.622; the third factor consists of two items with factor loads ranging from 0.907 to 0.886; and the fourth factor consisted of 3 items with factor loads from 0.731 to 0.535. The sub-dimensions of the scale, which was shaped as 4 sub-dimensions as a result of factor analysis, were named by two experts from the fields of Internal Medicine Nursing and Public Health Nursing. The first factor was named “Avoidance”, the second factor “Empathy”, the third factor “Relationship” and the fourth factor “Acceptance” (Table 1). The factor loads and common variances of the items collected under four factors as a result of the principal components analysis and decided to be included in the scale are presented in Table 1.

### Construct Validity: Confirmatory Factor Analysis (CFA)

The construct validity of the 4 sub-dimensions that emerged as a result of Exploratory Factor Analysis was tested with Confirmatory Factor Analysis. The values of  $\chi^2/df$  (Chi-Square/Degree of Freedom), RMSEA (Root Mean Square Error of Approximation), NFI (Normed Fit Index), CFI (Comparative Fit Index), AGFI (Adjusted Goodness of Fit Index), GFI (Goodness of Fit Index), IFI (Incremental Fit Index), and SRMR (Standardized Root Mean Square Residual) were evaluated for

**Table 1.** Exploratory Factor Analysis Results of the Attitude Scale Toward People Living with HIV/AIDS.

Factor name	Item number	Items	Factor 1	Factor 2	Factor 3	Factor 4	Cronbach Alpha ( $\alpha$ )
Avoidance	M11	I do not shake hands with someone who is HIV-positive.	0.781				0.852
	M9	I do not participate in the social activities that people living with HIV do.	0.767				
	M10	When HIV-positive people talk to me, I get nervous.	0.695				
	M18	Having an HIV-positive friend in my dorm room bothers me.	0.677				
	M13	I do not use the toilet in the house where an HIV-positive individual lives	0.643				
	M4	I do not eat food prepared by an HIV-positive person.	0.631				
	M2	would not send my children to a school where there are HIV-positive students.	0.586				
	M14	I do not want to care for an HIV-positive relative at home.	0.548				
Empathy	M15	I am saddened by the exclusion of HIV-positive people from society.		0.821			0.789
	M16	It upsets me when an employer fires an employee for being HIV positive.		0.780			
	M6	It saddens me that those who have HIV will have to live with the disease for the rest of their life.		0.695			
	M17	I respect the privacy of people living with HIV.		0.648			
	M8	It saddens me to learn that one of my friends is HIV-positive.		0.642			
Relationship	M3	I would not flirt with an HIV-positive person.			0.907		0.877
	M5	I would not marry an HIV-positive person.			0.886		
Acceptance	M7	HIV-positive people do not pose a threat to the health of people who do not have the virus.				0.731	0.551
	M1	I do not feel restless when working in the same place with people living with HIV.				0.672	
	M12	I accept HIV-positive people as they are, just as I accept my other friends.				0.535	
		<b>Eigenvalue</b>	5.324	2.785	1.528	1.133	
		<b>Explained variance</b>	%29.57	%15.47	%8.48	%6.29	
		<b>Explained total variance</b>		%59.83			
		<b>Total Cronbach alpha coefficient</b>					0.850
		<b>Kaiser-Meyer-Olkin value (KMO)</b>					0.833
		<b>Barlett test</b>					1900.213
		<b>Significance (P)</b>					<.001

this. As a result of DFA for the scale model consisting of 18 items and four sub-dimensions, the results obtained without any correction on the model are as follows:  $\chi^2/df = 4.234$ ,  $P < 0.001$ , RMSEA = 0.111, NFI = 0.88, CFI = 0.92, AGFI = 0.75, GFI = 0.81, IFI = 0.92, and SRMR = 0.097 (Table 2). As a result of the analysis, some items received correction suggestions. It was seen that there were correction suggestions between M1 and M4; M3 and M4; M3 and M5; M3 and M6; M4 and M5; M6 and M7; M9 and M10 items, which fall under the same factors. Corrections were applied between the items M1 and M4; M3 and M4; M3 and M5; M3 and M6; M4 and M5; M6 and M7; M9 and M10, respectively, which were predicted to make the highest contribution to

the model (Figure 1). The values obtained for the model after the modification process are as follows:  $\chi^2/df = 1.957$ ,  $P < 0.001$ , RMSEA = 0.060, NFI = 0.94, CFI = 0.97, AGFI = 0.87, GFI = 0.91, IFI = 0.97, and SRMR = 0.089 (Table 2). The resulting structure of the model is shown in Figure 1.

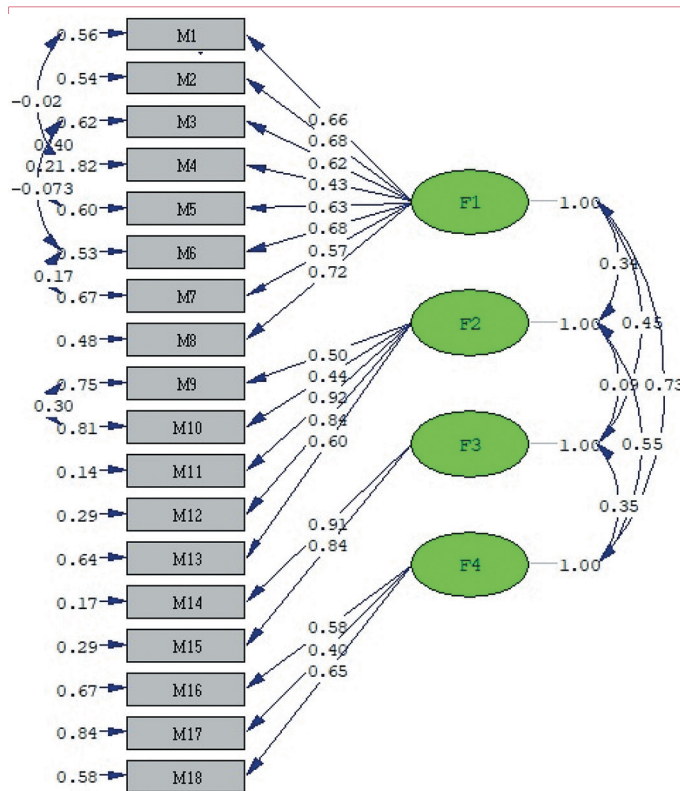
#### Analysis of Internal Consistency

The Chronbach Alpha value was calculated to assess the internal consistency. The scale's total Cronbach Alpha value of the scale was determined to be 0.85. The Cronbach Alpha values of the sub-dimensions of the scale were 0.85 for the first factor (Avoidance),

Table 2. Measurement Model Fit Measures before and after Correction.

Fit criteria	Good fit values	Acceptable fit values	Initial measurement values	Measurement values after correction
$\chi^2$			546.24	238.84
p değeri			$P < .001$	$P < .001$
$\chi^2/df$	$0 \leq \chi^2 \leq 2$	$2 \leq \chi^2/sd \leq 3$	4.234	1.957**
RMSEA	$0.00 \leq RMSEA \leq 0.05$	$0.05 \leq RMSEA \leq 0.08$	0.111	0.060*
AGFI	$0.90 \leq AGFI \leq 1.00$	$0.85 \leq AGFI \leq 0.90$	0.75	0.87*
GFI	$95 \leq GFI \leq 1.00$	$0.90 \leq GFI \leq 0.95$	0.81	0.91*
CFI	$0.95 \leq CFI \leq 1.00$	$0.90 \leq CFI \leq 0.95$	0.92	0.97**
NFI	$0.95 \leq NFI \leq 1.00$	$0.90 \leq NFI \leq 0.95$	0.88	0.94*
NNFI	$0.95 \leq NNFI \leq 1.00$	$0.90 \leq NNFI \leq 0.95$	0.90	0.96**
RFI	$0.95 \leq RFI \leq 1.00$	$0.90 \leq RFI \leq 0.95$	0.86	0.92*
IFI	$0.95 \leq IFI \leq 1.00$	$0.90 \leq IFI \leq 0.95$	0.92	0.97**
SRMR	$0 \leq SRMR \leq 0.05$	$0.05 \leq SRMR \leq 0.10$	0.097	0.089*
PNFI	$0.95 \leq PNFI \leq 1.00$	$0.50 \leq PNFI \leq 0.95$	0.75	0.75*

\*: Good fit value, \*\*: Acceptable fit value.



0.78 for the second factor (Empathy), 0.87 for the third factor (Relationship), and 0.55 for the fourth factor (Acceptance) (Table 1). A Cronbach Alpha coefficient between 0.80 and 1.00 indicates that the scale has high reliability.<sup>31</sup>

#### Test-Retest

A test-retest analysis was carried out to assess the consistency of the scale over time. This analysis, which is a method commonly used in internal consistency analyses in scale development studies, is performed to assess the consistency of the values obtained in different measurements taken at different times. In this analysis, the same scale is reapplied to 30 people selected from the study group 15 days later, and the scale mean scores obtained in the first test are compared with the scale mean scores obtained by the retest. The absence of a statistically significant difference between the scale mean scores obtained in both tests indicates that the results are similar and the scale is reliable over time.<sup>32</sup> 30 randomly selected students from among those who took part in the study were given a retest 15 days after the first application to examine the relationship between the two evaluations. The Pearson product-moment correlation and dependent sample *t*-test were used to assess the invariance (test-retest reliability) coefficient of the entire scale and its sub-dimensions. The test and retest scores of the Attitudes Toward People Living with HIV/AIDS Scale and its four sub-dimensions were found to have a statistically significant positive correlation, and the correlations were also found to be high (Attitudes Toward People Living with HIV/AIDS:  $r = 0.783$ ,  $P < .001$ ; Factor 1:  $r = 0.837$ ,  $P < .001$ ; Factor 2:  $r = 0.645$ ,  $P < .001$ ; Factor 3:  $r = 0.731$ ,  $P < .001$ ; Factor 4:  $r = 0.523$ ,  $P < .01$ ). In addition, a *t*-test was performed on dependent groups to determine whether there was a difference between test and retest measurement results. The mean scale score in the first application was  $69.03 \pm 7.47$ , and it was  $67.30 \pm 7.34$  in the second application. As a result, there was no

statistically significant difference between the scale mean scores obtained from the test and retest results ( $P > .05$ ). Based on these results, it was determined that this measurement tool has the property of providing similar measurement values in repeated measurements taken at different times. Therefore, this measurement tool can be considered reliable.

### Results Regarding Students' Attitude Scores

The mean age of the students participating in our study was  $21.29 \pm 1.86$  years, and the mean score on the attitude scale was found to be  $62.73 \pm 9.69$ . Based on this, it was determined that students' attitudes toward PLWHA are moderate. There was no significant difference in attitude scale scores between groups of students based on gender, economic status, or knowledge of HIV transmission routes ( $P > .05$ ). However, there was a statistically significant difference in attitude scale scores between departments ( $P < .01$ ). In the pairwise comparisons made to determine which groups differed, it was found that the attitude scores of the nursing department students were significantly higher than the attitude scores of the engineering students. It was also determined that students who had previously received HIV/AIDS education had statistically significantly higher attitude scores than those who had not ( $P < .05$ ) (Table 3).

### Discussion

Because there is no measurement tool that can evaluate the attitudes of university students toward people living with HIV/AIDS, and the validity-reliability measurement tools are not up-to-date, this research was planned to develop the "Attitude Scale towards People Living with HIV/AIDS", which will determine the attitudes of university students toward PLWHA.

In the evaluation made with our measurement tool, which was determined to be valid and reliable, it was determined that the attitudes of university students toward PLWHA were at moderate level. According to the findings of a study conducted by Bahadır-Yılmaz and Yüksel<sup>33</sup> (2020) on the AIDS attitudes of vocational school students, the students' attitudes were moderate. In their study with nursing students in Turkey, Kök et al.<sup>34</sup> revealed that nursing students have negative attitudes toward PLWHA. According to Maimati et al.<sup>35</sup>'s study in the Xinjiang Uyghur Autonomous Region, the majority of university students had negative attitudes toward the PLWHA. Similarly, Haroun et al.<sup>36</sup> found that the majority of students had negative attitudes toward PLWHA. Both the literature and the results of our study show that university students' attitudes toward PLWHA are not at the desired level. Our study results are consistent with the literature, and the reasons for the lack of desired attitude levels are predicted to be the traditional structure of Turkish society, not talking about sexually transmitted diseases within the family, particularly HIV/AIDS, and the inadequacy of HIV/AIDS awareness and information studies. Furthermore, beliefs that HIV/AIDS is linked to behaviors such as homosexuality, drug use, sex work, and promiscuous sexual intercourse are predicted to be among the reasons why attitudes toward PLWHA are not at the desired level.

In our study, it was found that the attitude scores of the nursing department students toward PLWHA were relatively higher than the scores of the students from other departments, and it was significantly higher than the engineering students' attitude scores. In their study, Ouzouni and Nakakis<sup>27</sup> (2012) found that nursing students have positive attitudes toward PLWHA. Lui et al.<sup>36</sup> discovered that students from two occupational groups had positive attitudes toward PLWHA in their study with medical and nursing students. It is estimated that the inclusion of HIV/AIDS education in the curriculum of the nursing

**Table 3.** Distribution and Comparison of Students' Attitude Scale Scores Towards Individuals Living with HIV/AIDS in Terms of Variables.

Variable	Group	$\bar{x}$	Min.	Max.	SD	Test Statistics
Gender	Female (n = 180)	63.30	36	85	9.43	$P = .559$
	Male (n = 106)	61.76	38	88	10.07	
Department	Nursing (n = 61)	66.23	49	86	8.53	$P = .003^{**}$
	Medicine (n = 19)	64.21	51	83	10.04	
	Engineering (n = 51)	60.67	45	88	9.75	
	Law (n = 52)	60.79	38	83	10.11	
	Islamic sciences (n = 49)	60.55	36	80	9.41	
	Foreign languages (n = 54)	64.06	39	82	9.41	
Economic status	Bad (n = 12)	60.00	53	72	6.66	$P = .558$
	Moderate (n = 219)	62.73	36	88	10.19	
	Good (n = 55)	63.35	51	88	8.04	
HIV/AIDS education	Yes (n = 89)	65.09	45	88	8.36	$P = .043^{*}$
	No (n = 197)	61.66	36	88	10.07	
Knowledge of HIV transmission routes	Yes (n = 250)	62.98	38	88	9.49	$P = .220$
	No (n = 36)	61.03	36	83	10.93	
Age	21.29	18	30	1.86		
Total attitude score	62.73	36	88	9.69		

$\bar{x}$ : Mean, Min: Minimum, Max: Maximum, SD: Standard Deviation,  $P$ : Significance.  
 $*P < 0.05$ .  
 $**P < 0.01$ .

department and the possibility of nursing students to have given care to patients with HIV/AIDS during their clinical practice might have led to higher attitude scores among nursing students. As a matter of fact, in our study, it was determined that the students receiving education on HIV/AIDS were significantly higher in nursing department students than in engineering students ( $P < .001$ ,  $\chi^2 = 35.581$ ).

In our study, students who stated that they had previously received HIV/AIDS education had statistically significantly higher attitude scores than those who did not. Parallel to our results, various studies

on the subject have shown that as one's knowledge of HIV/AIDS grows, so does one's positive attitude toward PLWHA.<sup>27,36–38</sup> According to the results of the study by Bozkurt and Bayırlı Turan<sup>38</sup> (2020), an increase in the level of knowledge about HIV/AIDS was associated with a decrease in the level of stigma toward PLWHA. Andrew et al.<sup>39</sup> found that high levels of knowledge about HIV/AIDS among university students were significantly associated with positive attitudes toward PLWHA. These results highlight the significance of HIV/AIDS education and information studies in improving attitudes toward PLWHA.

### Limitations

The main limitations of our study are that it was conducted only with students from six different departments and that the students who agreed to participate in the study were included in the sample without using the sampling method.

### Scoring and Use of the Scale

The Attitude Scale toward Individuals Living with HIV/AIDS consists of 4 sub-dimensions and a total of 18 items. Each item in the scale is in a 5-point Likert type. The minimum score that can be obtained from the scale is 18, and the maximum score is 90. Positive items are M1, M6, M7, M12, M15, M16, M17; negative items are M2, M3, M4, M5, M8, M9, M10, M11, M13, M14, and M18. While scoring positive items, “strongly disagree” option is calculated as 1 point and “strongly agree” option is calculated as 5 points. However, negative items are scored in the opposite way. An increase in the score obtained from the scale indicates that students' attitudes toward PLWHA have increased positively.

### Conclusion

As a result, this scale developed by the researchers is a valid and reliable tool that can be used to assess university students' attitudes toward PLWHA. Given the lack of a scale developed using exploratory and confirmatory factor analysis to measure university students' attitudes toward PLWHA at the time of the study, this study provided a valid and reliable measurement tool through which researchers could determine university students' attitudes toward PLWHA. The measurement tool developed as a result of this study will provide guidance to nurses, academicians, and other professional groups working in the field of HIV/AIDS in terms of planning and implementing interventions to determine and improve attitudes toward PLWHA among university students.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the Ankara Yıldırım Beyazıt University (AYBÜ) Social and Humanities Ethics Committee (date and number: 10.05.2017/37).

**Informed Consent:** Written informed consent was obtained from the participants.

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