

TURKISH VERSION OF THE MENTAL HEALTH LITERACY SCALE: PSYCHOMETRIC PROPERTIES

Ruh Sağlığı Okuryazarlığı Ölçeğinin Türkçe Versiyonu: Psikometrik Özellikler

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ABSTRACT

Mental disorders are major health problems that negatively affect people's health and quality of life. It is important for individuals to have mental health literacy to identify and treat the mental disorders early and seek professional help. The present study aims to conduct the Turkish validity and reliability study of the O'Connor and Casey Mental Health Literacy Scale. We performed a methodological study with 266 first-grade university students. The reliability of the scale was examined using invariance and internal consistency. Test-retest analysis (n=53) was conducted two weeks later. Test-retest stability was measured using Pearson's coefficient and intraclass correlation coefficient. Scale validity was assessed with validity analyses of language, interface, content, criteria, and construct. Exploratory and confirmatory factor analyses were conducted for construct validity. The study population included 266 participants (age, mean±sd: 20.34±1.83, female: %84.2). The Kaiser-Meyer-Olkin coefficient was 0.762, and the Bartlett Sphericity Test was 2243.887 and p<0.001. The Cronbach's alpha of the scale was 0.805; the test-retest reliability coefficient was 0.828; p<0.001; the interclass correlation was 0.805. Factor loadings ranged from 0.417 to 0.761, indicating a single-factor structure. The unidimensional structure of the scale was consistent with the confirmatory factor analysis. This study showed the validity and reliability of the Turkish version of MHLS. Broader generalizability of the results requires testing a more diverse population setting.

Keywords: Mental Health Literacy Scale, MHLS, mental health, health literacy, validity, reliability.

ÖZET

Ruhsal bozukluklar, insanların sağlığını ve yaşam kalitesini olumsuz yönde etkileyen önemli sağlık sorunlarıdır. Bireylerin ruhsal bozuklukları erken tanıyıp tedavi edebilmeleri ve profesyonel yardım alabilmeleri için ruh sağlığı okuryazarlığına sahip olmaları önemlidir. Bu çalışma, O'Connor ve Casey tarafından geliştirilen Ruh Sağlığı Okuryazarlığı Ölçeği'nin Türkçe geçerlik ve güvenilirlik çalışmasını yapmayı amaçlamaktadır. Bir üniversitenin birinci sınıfında eğitim gören 266 öğrenci ile yürütülmüş metodolojik bir araştırmadır. Ölçeğin güvenilirliği değişmezlik ve iç tutarlılık kullanılarak incelenmiştir. Test-tekrar test analizi (n=53) iki hafta sonra yapılmıştır. Test-tekrar test kararlılığı Pearson katsayısı ve sınıf içi korelasyon katsayısı kullanılarak ölçüldü. Ölçek geçerliliği, dil, yüzey, kapsam, içerik, ölçüt ve yapının geçerlilik analizleri ile değerlendirilmiştir. Yapı geçerliliği için açılımlayıcı ve doğrulayıcı faktör analizleri yapılmıştır. Çalışma popülasyonu 266 katılımcıdan oluşmaktadır (yaş, ortalama±ss: 20.34±1.83, kadın: %84.2). Kaiser-Meyer-Olkin katsayısı 0.762 ve Bartlett Küresellik Testi 2243.887 ve p<0.001 idi. Ölçeğin Cronbach alfa değeri 0.805; test-tekrar test güvenilirlik katsayısı 0.828; p<0,001; sınıflar arası korelasyon 0.805 idi. Faktör yükleri 0,417 ile 0,761 arasında değişmekte olup, tek faktörlü bir yapıya işaret etmektedir. Ölçeğin tek boyutlu yapısı doğrulayıcı faktör analizi ile uyumludur. Bu çalışma, MHLS'nin Türkçe formunun geçerliliğini ve güvenilirliğini göstermiştir. Sonuçların daha geniş ve farklı bir popülasyon grubunda test edilmesi önerilmektedir.

Anahtar Sözcükler: Ruh Sağlığı Okuryazarlığı Ölçeği, MHLS, ruh sağlığı, sağlık okuryazarlığı, geçerlik, güvenilirlik.

1.INTRODUCTION

According to the World Health Organization, more than one-third of people will be affected by a mental illness at some point in their lives (Demyttenaere et al., 2004). Keskin et al. (2013) report that the prevalence of mental disorders varies between 11 and 50% in the general population. According to the most recent survey conducted in the 1998 Turkey Mental Health Profile Study, 18% of adults suffer from a lifetime mental illness (Erol et al., 1998). The prevalence of depression was 9.0%, somatization disorders 5.0%, and panic disorders 2.0% in the Turkey Chronic Diseases and Risk Factors Study, which was last conducted in our country in 2013 (Ünal & Ergör, 2013). It is also known that mental disorders cause significant disability globally and in Turkey (Kılıc, 2020). Although there are significant developments in treating these mental disorders that lead to disabilities, many people with mental disorders do not know that they need treatment and cannot be treated (Lee et al., 2019). For these reasons, it is essential to improve the mental health literacy of all people who are likely to develop a mental illness during their lifetime.

The concept of mental health literacy was first introduced by Jorm et al. (1997) as "contributing to the recognition, management, and prevention of mental disorders and as a constellation of knowledge, attitudes, and beliefs about mental disorders." Mental health literacy encompasses the following six domains: (1) recognition of mental disorders, (2) treatment options, risk factors, and causes, (3) self-help measures, (4) knowledge and beliefs about available professional help, (5) attitudes that facilitate appropriate help-seeking, and (6) knowledge about how to access information" (Rafal et al., 2018).

When we analyze the definition of mental health literacy, we come across two steps to protect and improve mental health in society. The first step is to determine the level of mental health literacy, and the second step is to plan the necessary actions to improve the level of mental health literacy. In the first stage, the level and trend of knowledge, beliefs, and attitudes towards mental health in our society should be determined. A literature review shows that many studies determine the level of mental health literacy. Several studies addressed the importance of mental health literacy in protecting the mental health of individuals, especially children and adolescents (Mendenhall & Frauenholtz, 2013; Reardon et al., 2017). Studies examining socio-demographic variables have shown the association between these variables and the level of mental health literacy (Lee et al., 2019; Furnham & Hamid, 2014). Low mental health literacy appears to be a barrier to accessing mental health care (Benuto et al., 2019). In addition, low mental health literacy is associated with more medication errors, inadequate self-management of illness, and recurrence of similar health problems (Yılmazel G & Çetinkaya, 2016; Choi et al., 2017). Other similar studies have found that higher levels of mental health literacy are associated with reducing the stigma of mental illness and the development of positive help-seeking attitudes (Benuto et al., 2019; Kim et al., 2020). High levels of mental health literacy eliminate these problems; reduce inpatient hospitalizations, and lower health care costs (Choi et al., 2017; Özel & Duzcu, 2018). Given this information, it is essential to assess the mental health literacy of individuals and intervene in the necessary areas. Thus, a measurement tool that can comprehensively assess mental health literacy in all aspects is needed. After determining the level of mental health literacy, the second step is to improve the identified level and plan future interventions for identified problems (Kim et al., 2020; Thai et al., 2020). Mental health nursing and public health nursing have important roles and responsibilities in implementing these steps. These roles include protecting, developing, and improving the mental health of the population. These two disciplines provide education, identify problems, and intervene to improve mental health literacy (Regulation Amending the Nursing Regulation, 2011).

The number of studies on the importance of mental health literacy scales and the number of measurement instruments to assess mental health literacy is limited in the literature (Göktaş et al., 2019; O'Connor et al., 2014; Bjornsen et al., 2017; Tokur Kesgin et al., 2020). Two MHLS for adults have been developed abroad by Jung et al. (2016) and O'Connor and Casey (2015). Göktaş et al. (2019) examined the Turkish validity and reliability of the scale developed by Jung et al. (2016), and this scale does not address the stigma dimension of MHL. The scale developed by O'Connor and Casey (2015) measures the whole dimension of mental health literacy. Tokur Keskin et al. (2020) conducted the Turkish validity and reliability of this scale at the same time as our study, and the sample size in this study was designed differently from the original scale study and our study. The studies emphasized that these scales should be tested with other studies and samples (Göktaş et al., 2019; Tokur Kesgin et al., 2020; Jung et al., 2016; O'Connor & Casey, 2015). Furthermore, these scales are referred to by similar names. The MHLS conducted by O'Connor and Casey (2015) was developed in Australia, and a version specifically for Iranian culture was also created (Nejatian

et al., 2021). The MHLS assesses the characteristics of mental health literacy. These include the ability to recognize mental disorders, knowledge of associated risk factors and causes, and access sources of information, engage in self-help activities, and seek professional help. The MHLS is a robust psychometric measurement tool (O'Connor & Casey, 2015). In light of this, our study aimed to examine the validity and reliability of the Turkish version of the Mental Health Literacy Scale developed by O'Connor and Casey (2015), which can measure all attributes of mental health literacy.

2.METHODS

2.1. Study design, sample, and setting

This is a methodological study to determine the validity and reliability of the Turkish version of the 'Mental Health Literacy Scale.' The study was conducted with first-grade university students from January 15 to February 28, 2020. It is reported in the literature that the sample size in methodological research should be five to ten times the number of items (Tavşancıl, 2015). Considering this information, 266 students were sampled in this study to investigate the validity and reliability of this 35-item scale. The sample of our study consisted of first-year students studying in the departments of nursing (n= 101), health management (n=42), social work (n=57), and child development (n=66) in the Faculty of Health Sciences. First-year students were included in the sample to avoid receiving mental health training. The mental health and illness course are in the fourth year of the Faculty of Nursing, and the child development and social work course are in the second year. The participants were male (%15.8) and female (%84.2), and the mean age of the sample was 20.34±1.83 years.

The inclusion criteria for the study sample were as follows:

- ✓ Eligible subjects should not have attended any courses on psychiatry.
- ✓ They should be 18 years old, older, or younger than 65 years old.
- ✓ They should be able to speak Turkish.

The exclusion criteria for the study were that they wanted to leave the study and that they had previously completed mental health training.

2.2. Instruments

2.2.1 Socio-Demographic Characteristics and Mental Health Information Form

We developed the Socio-Demographic Characteristics form and Mental Health Information Form based on our findings from a literature review (Göktaş et al., 2019; Jung et al., 2016; O'Connor & Casey, 2015). The form asks about the participant's socio-demographic characteristics (age, gender, income level, parents' education level, and major field of education) and mental health information, including whether the participant or a relative has ever been diagnosed with a mental illness, the participant's information resources, and their level of knowledge about mental health.

2.2.2. Mental Health Literacy Scale by O'Connor and Casey

The Mental Health Literacy Scale was developed by O'Connor and Casey in 2015 to assess mental health knowledge and attitudes that contribute to the identification, management, and prevention of mental health problems (O'Connor & Casey, 2015). The scale is of the 4-point and 5-point Likert types. The items from one to 15 of the scale are of four-point Likert type, and the items from 16 to 35 are of five-point Likert type. The 10th, 12th, 15th, 20th to 28th items (12 items) are coded reverse. The scale consists of one dimension. The fifth and eighth items are arranged according to the definitions in the alternative classification of DSM-5 from American Psychiatric Association Diagnostic and Statistical Manual from Mental Disorders (American Psychiatric Association, 2013). The lowest score that can be obtained on the scale is 35, and the highest is 160. It has been reported that the higher the score obtained with the scale, the higher the mental health literacy (O'Connor & Casey, 2015).

2.2.3. Mental Health Literacy Scale.

Jung et al. developed the scale in 2016. Göktaş et al. established the validity and reliability of the scale in 2019 (Göktaş et al., 2019). The scale consists of 26 items and 3 sub-dimensions. The knowledge sub-dimension consisted of 12 questions, the belief sub-dimension consisted of 10 questions, and the resources sub-dimension consisted of four questions. The scores obtainable with the scale range from zero to 26, and



high total or subdomain scores are considered to indicate high levels of mental health literacy. The 22 questions in the first two subdomains of the scale are scored on a six-point Likert scale by selecting one of the following responses: 'strongly agree,' 'agree,' 'neither agree nor disagree,' 'disagree,' 'disagree at all,' 'strongly disagree.' The resources sub-dimension consisted of four questions with yes and no responses. A 'strongly agree' or 'agree' answer is scored as '1' while other answers are '0'. Questions 13-22 are reversely coded (Göktaş et al., 2019).

2.3. Procedures

We investigated the linguistic validity of the test in three steps. In the first step, the original English scale items were translated into Turkish by six English-speaking mental health experts (one professor, four associate professors, one medical specialist), resulting in a form in Turkish. In addition, a Turkish language expert assessed the suitability of a single translation from the Mental Health Literacy Scale into Turkish, and some word corrections were made according to the recommendations. In a second step, two bilingual translators with no prior knowledge of the Mental Health Literacy Scale translated this form back into Turkish: two were English-speaking nurses, and the other two were mental health experts fluent in Turkish and English.

In the third step, the researchers and the experts who had done the translations compared the corresponding expressions in Turkish and English. Based on the last translation, no changes were required to the wording. Then, six nurse educators specializing in mental health to eliminate any discrepancies reviewed the last version. We considered that the Turkish version obtained after the third step had linguistic validity.

We sought the opinion of five experts to calculate the content validity index (CVI) for the 35 items of the scale. The experts were asked to rate each item on a scale of 1 to 4. In this assessment of the comprehensibility of each item, 1: inadequate, deletion required, 2: inadequate, major revision required, 3: adequate, minor revision required, 4: extremely adequate, no revision required, was defined as. The CVI was calculated during the evaluation of the expert opinions. As a result of the expert evaluation of the scale points, 80% of the CVI is sufficient to obtain 3 and 4 points (Esin, 2014). If this score was 0.90 or higher, the item was considered perfect. Based on the content validity test by the CVI, we found perfect agreement among expert opinions (CVI=1.00) (Halek et al., 2017).

In the pre-application phase, the final version of the scale created from the expert opinions was applied to 10 students who met the research inclusion criteria at the university where the application took place. The students who had participated in the pre-application were not included in the sample of the research. At this stage, the comprehensibility and applicability of the scale were investigated. During the application, the necessary explanations were given to the students by the researcher. If the students had any questions about the topic, the researcher answered them. The students gave feedback that the scale items were clear and understandable and had no difficulty completing the scale. Thus, we concluded that the scale met the criterion of face validity.

Individuals who volunteered to participate in the study were enrolled. Participants were informed about the study. Data were collected under appropriate environmental conditions in an empty classroom under the supervision of the researchers in about 20-25 minutes. Data collection was repeated after two weeks on 53 students of the study sample to conduct the test-retest procedure. In the first data collection session, we asked the students to write some code in the top corner of the questionnaire to link the collected data for the test-retest procedure.

2.4. Data Analyses

Data were analyzed using SPSS version 21.0 (SPSS Inc., Chicago, IL). Categorical variables were summarized in frequencies and percentages. Continuous variables were summarized in mean and standard deviation, and minimum-maximum values. The One-Sample Kolmogorov-Smirnov Z test was used to assess normality. To test the construct validity of the scale, factor analysis was performed. The conformity of the data to the factor analysis was tested using the Kaiser-Meyer-Olkin (KMO) coefficient and Bartlett's Test of Sphericity. Factor analysis was performed using principal component analysis and exploratory factor analysis with Varimax rotation. In addition, confirmatory factor analysis was evaluated using the program AMOS 22.0. Any factor with an eigenvalue greater than one was included in the analysis, and those with factor loading values greater than 0.4 were considered significant. In determining criterion validity, Göktaş et al. the correlation between the scores obtained from the simultaneous application of the

26-item MHLS to the same group was calculated by Pearson correlation analysis. Cronbach's alpha coefficient was used to test the reliability of the scales. The item-total correlation method was used for item analysis. This tested the correlation between each item score and the total score. If an item was to be excluded, the Cronbach's alpha value of the scale was calculated with that item. A dependent t-test, Pearson correlation, and interclass correlation were used to analyze test-retest results. The results were analyzed with a confidence interval of 95%, and a p-value of 0.05 was accepted to indicate statistical significance.

2.5. Ethical Aspects of the Study

After review by a university non-interventional ethics committee for ethical compliance, this study was approved on 08/January/2020 with registration number 2. We explained the aim of the study and the study procedure to each participant; we informed participants that they could leave the study at will and that information obtained from participants would be kept confidential; we answered participants' questions and obtained written and verbal informed consent from participants.

3.RESULTS

3.1. Socio-demographic characteristics

In this study, the validity and reliability of the Turkish version of the Mental Health Literacy Scale (MHLS) were investigated in 266 students who did not attend classes in psychiatry. The results of the analysis of the study data are summarized below. The socio-demographic characteristics and mental health information of the participating students are shown in Table 1.

Table 1. The socio-demographic characteristics and mental health information of the participating

Variable	Min- Max	Mean±SD
Age	18-28	20.34±1.83
Gender	Number	Percentage (%)
Woman	224	84.2
Male	42	15.8
Mother's education level		
Illiterate	32	12.0
Literate	75	28.2
Secondary	108	40.6
High school	43	16.2
University and above	8	3.0
Father's education level		
Illiterate	7	2.6
literate	61	22.9
Secondary	105	39.5
High school	52	19.5
University and above	41	15.4
Income status		
Good	70	26.3
Middle	185	69.5
Bad	11	4.2
Mental illness		
Yes	10	3.8
No	256	96.2
Mental illness in the family		
Yes	41	15.4
No	225	84.6
A source of information about mental illness *		
Internet	159	59.8
Health personnel	53	19.9
Newspaper, book, magazine	20	7.5
Social environment (friend, neighbor, paren, sibling, etc.)	6	2.3
All	26	10.5

3.2. Reliability

In this study, invariance and internal consistency were examined to test the reliability of the scale. Invariance was tested using 'test-retest method, and internal consistency was tested using 'Cronbach's alpha coefficient' and 'item analysis.'

3.2.1. Invariance

The test-retest application was resent to the students two weeks later with the code (password) they had used in the first application. Students selected for the test-retest were chosen by lottery using the simple random method. This method ensured that each person in the sample had an equal chance of being included. Of the 70 students selected using this method, 53 students provided feedback.

The mean total scores obtained in the first and second administrations of the MHLS were 107.71 ± 10.89 and 110.37 ± 8.68 , respectively. We evaluated the test-retest reliability coefficient of the scale using Pearson correlation analysis. The analysis results showed a high-level, significant, and positive correlation between the test and retest scores ($r=0.828$; $p=0.001$). Test-retest reliability analysis of the scale showed that the correlation coefficient between classes was statistically significant and strong ($ICC=0.805$, $p=0.001$). In addition, we compared the test-retest means using the dependent samples t-test for significance, which revealed no statistically significant difference ($p=0.127$) (Table 2).

Table 2. Correlation analysis of test retest scores of A-MHLS (n=53)

Test-retest application	n	Mean \pm SD	Pearson correlation (r)	Interclass Correlation (ICC)* (%95 Confidence Interval)
Test	53	109.33 \pm 7.49	0.828	0.805 (0.769-0.837)
Retest	53	110.37 \pm 8.68	$p < 0,001$	$p < 0,001$
Test and P value	$t=1.550, P=0.127^a$			

^aDependent groups Ttest.

3.2.2. Internal consistency

Internal consistency analysis yielded a Cronbach's alpha coefficient of 0.805 for the MHLS. We examined the correlation coefficients between item and total scores and scores in the upper and lower 27 percentiles in the item analysis. Based on the results of the correlation analysis between item and total score, which showed that item 10 of the scale had a negative value ($r= -0.041$) and was below 0.20 compared to the other items, we removed item 10 from the MHLS. The correlation coefficients between item and total score ranged from 0.202 to 0.530 after removing item 10 from the MHLS (Table 3). Therefore, the MHLS in our study is different from the original study because it contains 34 items.

Each item of the scale is scored on a 4- or 5-point Likert scale as in the original scale. The items from one to 14 of the scale are of four-point Likert type, and the items from 15 to 34 are of five-point Likert type. The reverse-coded item number 20 of the original scale was item 19 (people with a mental illness could detach if they wanted to) in the final version of the scale used in our study. For better understanding and clarity, we felt it was appropriate not to recode this item. Items numbered 11, 14, 20-27 are reverse coded. The minimum and maximum scores obtained on the scale are 34 and 156 points, respectively. A high score on the scale indicates a high level of mental health literacy.

An independent t-test analysis comparing scores in the upper and lower 27th percentiles showed significant differences between all item and subscale scores.

Table 3. The item-total score correlation coefficients analysis result (analyzes before and after the 10th item is removed)

Scale items	Item-total correlation coefficient	Cronbach's Alpha if Item Deleted		Item-total correlation coefficient	Cronbach's Alpha if Item Deleted
Item1	0,211	0,795	N=266 Total item number = 35 Cronbach's alpha = 0.798 Mean \pmSD = 110.32\pm10.88	0,215	0,802
Item2	0,361	0,791		0,364	0,798
Item3	0,252	0,794		0,254	0,801
Item4	0,292	0,793		0,283	0,800
Item5	0,208	0,795		0,208	0,803
Item 6	0,260	0,794		0,268	0,801
Item 7	0,271	0,794		0,274	0,801
Item 8	0,299	0,792		0,307	0,799
Item 9	0,228	0,795		0,244	0,802
Item 10	-0,043	0,805		0,260	0,801
Item 11	0,261	0,794		0,208	0,804
Item 12	0,211	0,796		0,362	0,799
Item 13	0,352	0,791		0,223	0,802
			N=266 Total item number= 34 Cronbach's alpha=0.80 Mean \pmSD = 107.71\pm10.89		

Item 14	0,217	0,795	0,215	0,803
Item 15	0,211	0,795	0,272	0,801
Item 16	0,260	0,794	0,343	0,798
Item 17	0,341	0,790	0,358	0,797
Item 18	0,348	0,790	0,491	0,792
Item 19	0,483	0,784	0,251	0,802
Item 20	0,248	0,795	0,210	0,805
Item 21	0,214	0,797	0,256	0,802
Item 22	0,267	0,794	0,202	0,804
Item 23	0,205	0,796	0,530	0,791
Item 24	0,536	0,783	0,360	0,797
Item 25	0,366	0,789	0,382	0,796
Item 26	0,390	0,788	0,461	0,793
Item 27	0,462	0,786	0,439	0,794
Item 28	0,443	0,786	0,242	0,802
Item 29	0,237	0,794	0,360	0,797
Item 30	0,357	0,790	0,334	0,798
Item 31	0,327	0,791	0,300	0,800
Item 32	0,304	0,792	0,208	0,803
Item 33	0,207	0,796	0,223	0,803
Item 34	0,221	0,796	0,202	0,803
Item35	0,208	0,796		

3.3. Validity

3.3.1. Criterion Validity

In this study, the 26-item MHLS, whose psychometric properties were made by Göktaş et al., was used for criterion validity. These two scales measuring similar characteristics were applied simultaneously to the same participant group in the same session. Because these two tests are intended to measure the same attributes, we tested criterion validity and concurrent validity. We calculated the correlation coefficients of the total scores of these two tests and found a positive and significant correlation. ($r = 0.374$, $p = 0.001$) (Table 4).

Table 4. Criterion validity analysis result

Scales	The Mental Health Literacy Scale (MHLS)	
	r^{**}	p
The Mental Health Literacy Scale*	0,374	0.001

*Mental Health Literacy Scale, whose psychometric properties were made by Göktaş et al.; **Pearson correlation analyze.

3.3.2. Construct Validity

We conducted an exploratory factor analysis in this study to test the construct validity of the scale. Conformity of the data to the factor analysis was assessed using the Kaiser-Meyer-Olkin Test, resulting in a KMO score of 0.762. We tested the adequacy of the sample size using Bartlett's Test of Sphericity ($\chi^2 = 2243.887$, $p = 0.001$). Based on these results, we determined that factor analysis was feasible for the variables. To facilitate generalizability and interpretation of the results, we used principal component analysis and the Varimax rotation method to calculate the scale's factor structure. We evaluated the results of the factor analysis of the MHLS based on factor attainment, interpretability, and the eigenvalue criterion. The items with eigenvalues greater than 1 were defined as 'important factors.' We obtained a factor structure with eigenvalues greater than one that explained 55.37% of the total variance. Moreover, the factor loadings of this scale ranged from 0.417 to 0.761 (Table 5). In our study, the fit of the model was tested by evaluating the (χ^2/df) value, sample size, and goodness of fit using the Root Mean Square Error of Approximation (RMSEA), Root Mean Square Residual (RMR), Goodness-of-Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI) indices. Modifications were made in this study. The χ^2/df ratio was found to be 2.771 ($\chi^2 = 1174.710$; $df = 424$; $p = 0.000$). When the fit of the obtained model was tested, the following values were obtained: GFI 0.747; AGFI 0.704; RMR=0.074; RMSEA=0.082.

Table 5. Factor Analysis

N=266 Total variance explained= 55.37%	Scale items	Factor Loading	Scale items	Factor Loading
	İtem1	0,682	İtem 18	0,741
	İtem2	0,532	İtem 19	0,574
	İtem3	0,687	İtem 20	0,508
	İtem4	0,617	İtem 21	0,625
	İtem5	0,417	İtem 22	-0,613
	İtem 6	0,689	İtem 23	0,617
	İtem 7	0,750	İtem 24	0,642
	İtem 8	0,496	İtem 25	0,660
	İtem 9	0,693	İtem 26	0,737
	İtem 10	0,544	İtem 27	0,639
	İtem 11	0,645	İtem 28	0,585
	İtem 12	0,478	İtem 29	0,669
	İtem 13	0,728	İtem 30	0,761
	İtem 14	0,611	İtem 31	0,743
	İtem 15	0,520	İtem 32	0,618
	İtem 16	0,579	İtem 33	0,538
İtem 17	0,607	İtem 34	0,710	

4. DISCUSSION

MHLS is a scale that assesses all aspects of mental health literacy. This study was conducted to analyze the Turkish validity and reliability of MHLS. These include the ability to recognize mental disorders, knowledge of associated risk factors and causes, and access information sources, perform self-help activities and seek professional help.

Reliability of the MHLS

Reliability measures the stability and consistency of a measurement instrument in measuring the intended characteristic in test-retest assessments (Alpar, 2012). In this study, invariance and internal consistency were examined to test the reliability of the scale. We tested invariance using the 'test-retest method and internal consistency using 'Cronbach's alpha coefficient' and 'item analysis.'

A test-retest analysis compares results obtained by repeatedly administering a measurement instrument under the same conditions to the same group of subjects after the first administration over a period long enough to prevent recall but short enough to allow no changes in the variables (Ercan & Kan, 2004). For attitude scales, a period of four to six weeks between test and retest is generally recommended, although this may depend on the type of measurement instrument (Esin, 2014; Şencan, 2005). Şencan (2005) reported that the test-retest correlation coefficient should be at least '0.80'. "However, Yasar (2014) reported that a value of '0.70' is appropriate." In this study, we conducted the retest two weeks after the first session in 53 participants from the study sample. We calculated a correlation coefficient of 0.828. O'Connor and Casey report that the retest was administered two weeks after the first test to 69 participants and that the correlation coefficient was calculated to be 0.797 (O'Connor & Casey, 2015). Göktaş et al. (2019) and 0.99 in Tokur Kesgin et al. (2020) report the correlation coefficients as 0.717 in the study. As in other studies, the test-retest coefficient in our study shows that the scale is consistent over time.

The Cronbach's alpha coefficient is reported as a measure of internal consistency and homogeneity of the scale items (Kalaycı, 2010). A reliability coefficient of Cronbach's alpha in the range of $0.60 \leq \alpha < 0.80$ indicates that the scale is reliable, and a range of $0.80 \leq \alpha \leq 1.00$ indicates high reliability (Yasar, 2014). In our study, the Cronbach alpha coefficient of the scale was found to be 0.805. The correlation coefficients are 0.873 in the study of O'Connor and Casey (2015), 0.71 in the study by Göktaş et al. (2019), and 0.89 in the study of Tokur Kesgin et al. (2020). In the study by Göktaş et al., the Cronbach alpha coefficient of the scale was at a reliable level, while our and other studies showed high reliability.

The correlation coefficient of total item scores: correlation analysis tests the strength of correlations and consistency between scale items. Another method is to examine the correlation between the individual item scores and the total score. To perform an adequate correlation analysis between items and total scores, the number of participants in the sample should be between 100 and 200, or the number of participants completing the scale should be at least five times the number of scale items. In addition, the correlation coefficient between item and total score should be less than 0.20 and should not have a negative value

(Şencan, 2005; Çam & Arabacı, 2010). We believe that the sample size in our study ($n=266$) is sufficient to perform the item analysis following the reports in the literature. Among the methods of correlation-based item analysis, we used the 'corrected item-total score correlations' in this study. Only item 10 of the scale tested in our study had a correlation coefficient of less than 0.20 and had a negative correlation (-0.041) with other scale items. Therefore, in developing the MHLS in our study, we removed item 10 from the original scale. The correlation coefficients between item and total score of the MHLS ranged from 0.202 to 0.530 after excluding item 10. The study on the original scale reported that the items with total score correlations of less than 0.2 were removed from the scale (O'Connor & Casey, 2015). The item total score correlations of Tokur Kesgin et al. (2020) ranged from 0.31 to 0.64. In parallel with our study, it was observed that the item total score correlations had a weak and moderate relationship in the positive direction.

Upper and lower 27th percentiles: another method of analysis to determine item discrimination or validity is to calculate the means of the upper and lower 27th percentiles. The t-test for independent groups revealed a significant difference in both item and subscale scores between our study's upper and lower 27th percentiles. We conclude that the results of the item total score correlations and the comparisons of scores between the upper and lower percentiles indicate sufficient strength of item discrimination.

Validity of MHLS

Validity indicates how accurately a particular attribute is measured, especially in discriminating it from other attributes. The literature recommends that linguistic, content, and critical (concordant) validity be analyzed for Likert scales (Çam & Arabacı, 2010). The validity of the scales was assessed using analyses of linguistic, content, critical, and construct validity.

Criterion validity tests the similarity of the results obtained with the scale under study and another scale with demonstrated validity and reliability that measures the same behavior or attitude. Şencan (2005) reported that a correlation coefficient should never be less than '0.30. Based on this information, we accepted that a correlation coefficient of at least '0.30 is required to confirm criterion validity. We used the 26-item Mental Health Literacy scale, whose psychometric properties were made by Göktaş et al. (2019) to test the criterion validity. We calculated the total correlation coefficients between the two scales and found a positive and significant relationship between these two scales. ($r=0.374$, $p=0.001$).

In conclusion, the criterion validity of the MHLS was confirmed in this study as indicated by the criterion validity coefficients of more than 0.30 in agreement with the literature. Tokur Kesgin et al. (2020) used the well-known group comparison method for criterion validity. According to the results of this method, the level of mental health literacy was higher in individuals with a previous psychiatric/psychological treatment history than in individuals without a treatment history. Although different methods are used for criterion validity, the study results showed that the criterion validity of the scale was ensured.

Our study, a KMO score greater than .60, and a significant result on Bartlett's Test of Sphericity led us to conclude that the sample size was sufficient to conduct a factor analysis. We evaluated the results of the factor analysis of the MHLS based on interpretability, factor loadings, and the eigenvalue criterion. The literature recommends removing an item from the scale if the factor analysis yields a corresponding factor score of less than 0.40 (Yaşlıoğlu, 2017). To account for factor structure, we used two-sided factor loadings greater than 0.40 in this study. We did not remove any items from the scale because the factor loading values were greater than 0.40, as indicated by the factor analysis. The survey of the original scale reported that a 4-factor structure would be most appropriate. However, the same study also reported that a unidimensional structure would be most informative because fewer items would be grouped under individual factors, and low factor loadings would be found. A review of studies addressing the same issue shows that factor loadings range from 0.36-0.98 (Jung et al., 2016) to 0.36-0.84 (Göktaş et al., 2019). Parallel to the results of our study, it can be said that the factor loadings of all scale items of other studies are reasonable.

In this study, a χ^2/df ratio of 2.771 was obtained ($\chi^2=1174.710$; $df=424$; $p=0.000$). The sample size was considered appropriate, as the χ^2/df ratio should be between 0.10 and 3 (Gürbüz & Şahin, 2017). When the fit of the obtained model was tested, the following values were obtained: GFI 0.747; AGFI 0.704 RMR=0.074; RMSEA=0.082. RMR and RMSEA values of less than 0.05 indicate a good fit. RMSA value was expected to be less than 0.10, and RMR value was expected to be equal to or less than 0.08 for

adaptation (Schermelleh-Engel et al., 2003). The GFI and AGFI values ranged from 0 to 1, close to 1 indicating good adaptation

The GFI and AGFI values must be greater than or equal to 0.85. When the sample size is large (greater than 250), the GFI and AGFI values are considered acceptable and a good fit Ishiyaku et al., 2017; Erkorkmaz et al., 2013). Based on this information, the GFI and AGFI values were close to the acceptable limits. Since the scale was evaluated with the GFI and AGFI values and other fit indicators, our study's unidimensional structure is compatible with the CFA results and can be used by researchers. However, it can be said that this fit is not perfect, and the fit indices can be re-examined on different samples.

5. CONCLUSION

This study shows that the Turkish version of the MHLS is valid and reliable. We believe that we have introduced a scale in the literature to assess all mental health literacy characteristics in Turkish. Our study shows that the MHLS can be used to assess the level of mental health literacy of individuals and identify the areas where help is needed. In addition, the scale will allow researchers to assess the changes that occur in individuals after interventions to improve mental health literacy.

Limitations of the study

The sample group of the study is limited to the age group 18-28 years. This is because the original scale corresponds to the age group, and it is believed that mental health awareness increases with age. It is also intended to reach people who have not yet completed a mental health course or training. The MHLS may be explored in further studies with different populations. The fact that the participants were between 18 and 28 years old and the study was conducted at a single university is limited in generalization. Therefore, it is recommended that the scale be studied in other populations and the scale's psychometric properties be evaluated.

Implications for Nursing Practice

MHLS helps diagnose mental disorders early, identify risk factors and causes, seek professional help, and manage them. Mental health nursing and public health nursing aim to prevent and identify mental disorders to provide or improve care. To achieve psychiatric nursing and public health nursing goals, it is critical to determine the level of mental health literacy and plan the necessary educational programs. The MHLS is designed to help achieve these goals. In addition, the MHLS is expected to make an important contribution to evidence-based nursing practice.

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Conflict of interest

The authors declare that they have no conflict of interest.

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