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Psychometric properties of the Masculine Depression Scale in Turkish male university students

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Abstract

Aim: This study aims to examine the psychometric properties of the "Masculine Depression Scale" (MDS) in Turkish male university students.

Design and Method: This methodological study was conducted with 337 male university students in 2018.

Results: Exploratory factor analysis (EFA) reduced the total item number from 44 to 18; the scale included two factors explaining 51.94% of the total variance. Confirmatory Factor Analysis (CFA) showed standard regression coefficients between .59 and .75. The Cronbach's α values were .74 to .92 and item-total coefficients were 0.22 to 0.71.

Implementation Results: The two-factor, 18-item MDS is appropriate to assess masculine depression properties in Turkish male university students.

KEYWORDS
male university students, masculine depression, psychometric properties, Turkish

1 | INTRODUCTION

Depression is among the most common health problems in university students.[1] A study carried out with university students found that 21.2% had depression to the extent that it affected their academic success, and 14.7% had serious suicidal thoughts, while 8.4% of male students had depression at the clinical level.[2]

Typical and externalized symptoms of depression are frequently observed among young adult male university students.[3] Some males show externalized symptoms such as irritability, anger, aggression, risk-taking, or use of alcohol/substances to regain emotional control from negative emotions experienced in typical depression symptoms.[4] Even though the literature indicates that women are diagnosed with depressive disorder twice as often as men,[5] many men frequently experience depression.

Issues regarding diagnosis and treatment of depression symptoms occur more frequently in men.[6] Many psychiatrists, psychologists, physicians, and so forth have researched,

reviewed, and weighed in on the diagnostic criteria for depression, especially as it appears in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). Some researchers and clinicians emphasize that sometimes men experience depressive symptoms that are not included in DSM-V.[7] Families, friends, and even doctors may not regard the externalized depressive symptoms observed in men as depression symptoms.[8]

Externalized symptoms can be a certain phenotypic property of depression in men and assessing these symptoms can help identify individuals that do not display typical internalized symptoms (sadness, hopelessness, etc).[4] Clinicians may fail to notice high-risk patients because men mask or atypically express depression symptoms.[6,9] There is a general concern that common survey tools and available diagnosis criteria may not be sensitive to depression experiences of men and therefore, many men with depression cannot be identified in clinical practice.[9] There is a need for measurement tools that are sensitive to a commitment to

masculine norms and individual differences in experiencing depression (eg, The Masculine Depression Scale[10]; The Masculine Depression Risk Scale[11]) to help identify specific symptoms of "male depressive syndrome."[10,12]

Even though there are many measurement tools that assess depression regardless of gender, Masculine Depression Scale (MDS) is frequently used to analyze masculine depression and assess men's depression experiences and expressions, particularly in the United States. There are differences in Turkish and American culture in terms of gender roles. More patriarchal and male-dominated characteristics are observed in Turkish society compared to American society. In Turkish culture, adopting culturally hegemonic masculine norms require being emotionally in control and not being weak. Men generally associate depression with an expression of weakness and uncontrolled emotion.[13] Nevertheless, a measurement tool such as the MDS has not been used in Turkish culture. This study aims to analyze the psychometric properties of MDS in male university students; a high-risk group in terms of depression.

2 | MATERIALS AND METHODS

2.1 | Design, time, and place of the study

This methodological study was carried out with male students at a state university in the Black Sea Region of Turkey between February and March 2018.

2.2 | Study process

After the MDS was translated into Turkish by three professionals fluent in English and Turkish, a joint text was formed. Expert opinions were obtained for content validity and the "Content Validity Index (CVI)" was calculated. The Turkish version was finalized after the necessary modifications were made in line with expert opinions.[14] Two experts from the department of Turkish Language and Literature reviewed whether the Turkish version was suitable in terms of grammar and expression and then the necessary modifications were made. The Turkish and English versions of the MDS were administered to a group of 22 men who understood both languages.[14] Then, a pilot study was conducted on 66 male university students outside of the study population who met the inclusion criteria.[14] Subsequently, the MDS was back translated into English by four translators fluent in Turkish and English. The Turkish version that was back translated into English was reviewed, finalized, and compared to the original form.[14] Exploratory and confirmatory factor analyses were conducted for structural validity. Cronbach's α value and item-total score correlation were used to test the reliability of the scale. The MDS was readministered to a group of 110 people at 2-week intervals to analyze the test-retest correlation.[14]

2.3 | Sample and participants

Scale adaptation studies recommend that the number of participants included in the sample should be 5 to 10 times greater than the number of items. In this study, the sample size was determined to be between 220 and 440 (n = 337) according to the number of MDS items,[15] as well as the "Sample Size Formula for Known Population."[16,17] The number of students was calculated as 337 using the Neyman Allocation Method, a stratified random sampling method, and 340 male students stratified by faculty type were included in the study. During data collection, three students were excluded from the study due to missing data. The study was completed with 337 participants.

The mean age of the students was 21.05 ± 2.27. Approximately one-third of the participants (33.2%) studied at the Faculty of Science and Literature, and 32.9% were in their first year. Of the students, 43% stayed in dormitories and 34.6% consumed alcohol (Table 1).

2.4 | Data collection tools

Data were collected using the MDS and Beck Depression Inventory (BDI).

2.4.1 | Masculine Depression Scale

The MDS is a 4-point Likert type, self-evaluation scale with 44 items which was developed by Magovcevic and Addis[10] to assess the masculine properties of a major depressive disorder.[10] After the language validity of the MDS was established, it was administered to participants.

2.4.2 | Beck Depression Inventory

The BDI was developed by Beck et al[18] to determine the severity of depression symptoms in adults. The Turkish validity and reliability study of BDI was carried out by Hisli[19]. In the present study, BDI was used to test the concurrent validity of MDS and the Cronbach's α coefficient was calculated as .92.

2.5 | Statistical analysis

Data were analyzed using the IBM SPSS Statistics 23 and IBM SPSS AMOS 23 (Armonk, NY) programs. Frequency distribution was used for categorical variables, and descriptive statistics were used for numeric variables (mean, standard deviation) during data analysis. Structural validity was assessed using exploratory (EFA) and confirmatory (CFA) factor analysis, reliability was assessed using Cronbach's α, and the scale was assessed using item-total score

TABLE 1 Characteristics of the participants

	$\bar{x}$	SD
Age	21.05	2.27
	n	%
Faculties		
Physical Education and Sports College	39	11.6
Faculty of Education	31	9.2
Faculty of Science-Literature	112	33.2
Faculty of Fine Arts	32	9.5
Faculty of Theology	17	5.0
Music and Performing Arts Faculty	23	6.8
Faculty of Health Sciences	16	4.7
Faculty of Medicine	23	6.8
Faculty of Agriculture	44	13.1
Year		
First year	111	32.9
Second year	97	28.8
Third year	65	19.3
Fourth year	64	19.0
Accommodation		
Dormitory	166	49.3
House	126	37.4
With family	45	13.2
Economic status[a]		
Poor	31	9.2
Average	202	59.9
Good	99	29.4
Academic success[a]		
Poor	37	11.0
Average	173	51.5
Good	126	37.5
Alcohol		
Yes	114	34.6
No	215	65.4
Total	337	1

[a]Economic status and academic success are perceived value by students.

correlation. Paired sample t test was used to carry out the repetitive testing, and Spearman correlation coefficient was used to assess the correlation between numeric variables. Statistical significance was accepted as $P < .05$.

2.6 | Ethical considerations

Before adapting the MDS to Turkish, approval was obtained from Mariola Magovcevic, who developed the scale. The study was initiated after obtaining ethics committee approval and the participants' written consent.

3 | RESULTS

3.1 | Validity

3.1.1 | Language validity

The translation-back translation method was used to test the language validity of the scale. Firstly, the scale was translated into Turkish by three professionals fluent in English and Turkish. Then it was back translated into English by four experts fluent in Turkish and English and was compared to the original scale. The Turkish version and English original form of the MDS were administered to 22 men who knew both languages well, having lived abroad (United States, England, and Canada), and were native to the Turkish language.[14] The analysis of the relationship between the results showed a statistically significant positive relationship between the Turkish and English forms in terms of the MDS total ($r = .93$, $P < .05$), internalizing ($r = .94$, $P < .05$), and externalizing ($r = .84$, $P < .05$) scores.

3.1.2 | Content validity

The form that included the Turkish translation of the MDS and the original English items were sent to 16 experts including psychiatric doctors and nurses to ensure content validity. Expert opinions were assessed in line with the Davis Method. The CVI was calculated for each item and a value of 0.80 was set as a statistical criterion.[14,15] As the CVI value was higher than 0.80 for each item, no item was excluded. An average CVI of 0.97 ± 0.04 was calculated for all of the MDS items. In line with these results, it was determined that content validity was ensured for the MDS. Additionally, modifications were made in line with expert opinions and the Turkish version of the MDS was finalized.[14] Two experts from the department of Turkish Language and Literature reviewed whether the Turkish version was suitable in terms of grammar and expression and necessary modifications were made.

3.1.3 | Structural validity

Structural validity of the MDS was tested using EFA, CFA, and Convergent Validity. According to the Kaiser Meyer Olkin (KMO = 0.932) value, the sample size was found to be beneficial and suitable for the factor analysis administered to the data.[17] After a Bartlett Sphericity test, the data were found to be suitable for factor analysis ($\chi^2 = 5475.861$, SD = 153, $P < .001$).[17] As a result of the EFA carried out to determine the factor number of the scale, factors in which the eigenvalue was higher than 1.00 were assessed and a 9-factor structure was found. As the original scale consisted of two factors, the factor number was limited. Then, EFA was carried out on the data set and the "*Principal Component Analysis*" was chosen as the factor removal method.[15,16] Factor numbers were collected under two

TABLE 2 CFA for fit index values

Indexes	Good fit	Acceptable fit	Results	Decisions
χ^2/df	$0 \leq \chi^2/df \leq 3$	$3 \leq \chi^2/df \leq 4$	2.56	Good fit
GFI	$0.95 \leq GFI \leq 1$	$0.90 \leq GFI \leq 0.95$	0.90	Acceptable fit
TLI	$0.95 \leq TLI \leq 1$	$0.90 \leq TLI \leq 0.95$	0.91	Good fit
CFI	$0.95 \leq CFI \leq 1$	$0.90 \leq CFI \leq 0.95$	0.92	Good fit
RMSEA	$0 \leq RMSEA \leq 0.05$	$0.05 \leq RMSEA \leq 0.08$	0.07	Good fit
SRMR	$0 \leq SRMR \leq 0.08$	$0.05 \leq SRMR \leq 0.10$	0.052	Good fit

Abbreviations: χ^2/df, Chi square/degrees of freedom; CFA, confirmatory factor analysis; CFI, comparative fit index; GFI, the goodness fit index value; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis index.

subscales as in the original study and the items with a factor load higher than 0.50 were included in the scale.[15,17] After the factor analysis, the number of items was reduced from 44 to 18. EFA found that these two factors explained 51.94% of the total variance (Table 3.)

Then, CFA was carried out to test how the available structure responded to adaptation.[16] In the first stage, a first-order CFA model, which included latent variables of the two subscales (F1 = Internalization, F2 = Externalization) and the indicator variables of the items forming these factors, was formed.[17,20]

TABLE 3 EFA results and standard regression coefficients (n = 337)

Items	Description	EFA				CFA
		Factor loadings		Eigenvalue % of variance	Eigenvalue	Standard regression coefficients
Item 6	I've felt like I am in a pit.	0.75	Internalizing	38.72	6.97	.75
Item 2	I've felt trapped.	0.72				.65
Item 7	The odds are against me.	0.71				.66
Item 30	I think about crying, but I can't cry.	0.71				.70
Item 13	I've felt like I have a heavy weight on my chest.	0.71				.65
Item 22	I've been keeping to myself.	0.71				.64
Item 24	I've had lots of reasons to cry, but I haven't cried.	0.70				.68
Item 8	I've felt like things are out of my control.	0.69				.65
Item 19	People don't understand what is going on with me.	0.69				.69
Item 21	I've had unexplained aches and pains.	0.67				.68
Item 9	I just can't win.	0.65				.59
Item 12	I feel like I won't be able to keep up with my responsibilities.	0.65				.59
Item 29	I am down but it seems best to keep it to myself.	0.63				.66
Item 17	I haven't felt anything.	0.61				.64
Item 28	No one gives me a break.	0.59				.66
Item 41	Alcohol or drugs have helped me feel better.	0.85	Externalizing	12.22	2.38	.74
Item 39	I have used recreational drugs a lot.	0.84				.64
Item 38	I have been drinking a lot.	0.80				.72
Total				51.94		

Abbreviations: CFA, confirmatory factor analysis; EFA, explanatory factor analysis.

In the second stage, the *maximum likelihood* method, which is commonly used in structural equation models during model estimation and gives reliable results even when data are not normally distributed, was used.[15-17] The aim was to estimate the errors of the observable variables, the variances of the latent variables, and the parameters covering the regression coefficients related to the paths drawn from the observable variables to the latent variables (Figure 1). Standard regression coefficients of the items are displayed in Table 3.

In the last stage, fit indices of the 2-factor first-order CFA model were analyzed (Table 2). According to the fit indices, the chi square/degrees of freedom (χ^2/df: 2.56), Tucker-Lewis index (TLI: 0.91), comparative fit index (CFI: 0.92), root mean square error of approximation (RMSEA: 0.07), and standardized root mean residual (SRMR: 0.052) values were good and the goodness of fit index (GFI:

0.90) was acceptable.[16,17] The results showed that the two-factor structure of the MDS with 18 items indicated a good fit.

3.1.4 | Convergent validity

Another way to test validity is "Convergent Validity (Similar Scale Validity)," which is based on the assumption that the measurement tool significantly correlates with a similar measurement tool that investigates the same concept or other parameters that are similar to itself and the original.[15] The validity of the MDS was tested using BDI, which is commonly used to identify depression. There was a statistically positive significant relationship between the BDI and the MDS total ($r = .75$, $P = .00$), internalization ($r = .75$, $P = .00$), and externalization scores ($r = .29$, $P = .00$) ($P < .05$).
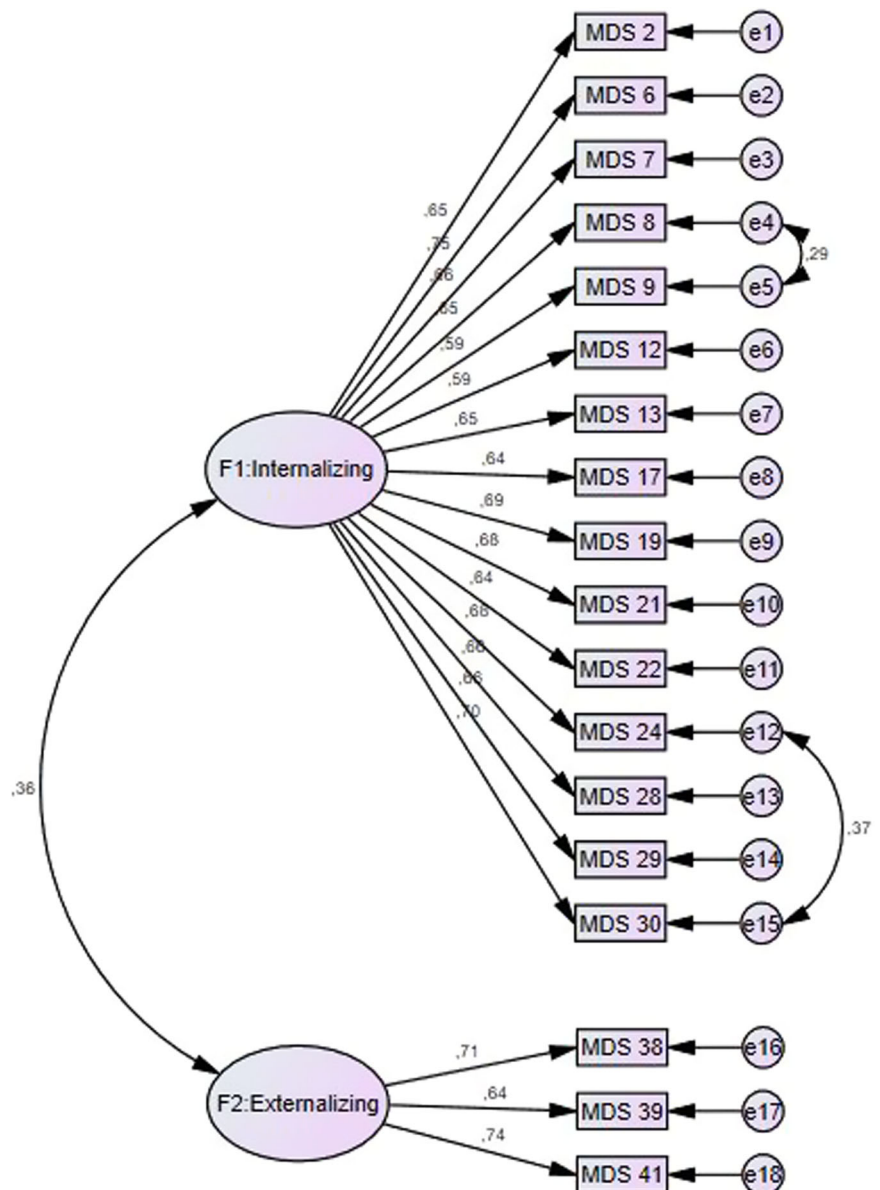

FIGURE 1 First-order CFA model with two subscales. CFA, confirmatory factor analysis; MDS, Masculine Depression Scale [Color figure can be viewed at wileyonlinelibrary.com]

This result showed that the MDS was successful at measuring depression for this group.

3.2 | Reliability

Reliability of the MDS was tested using internal consistency tests (Cronbach's α, item-total score correlation) and test-retest method.[15,16]

3.2.1 | Internal consistency

In Likert-type measurements, Cronbach's α—which is one of the best indicators for determining scale items' homogeneity and whether it measures the intended concept—being close to 1 indicates that it is reliable.[16,17] The study found that the Cronbach's α values of the MDS and its internalizing and externalizing subscales were 0.91, 0.92, and 0.74, respectively. These values were higher than the acceptable 0.70 value.[16] Moreover, the item-total score correlation was used to determine each item's relationship with total score.[15,17] Many researchers use the items of which coefficients are higher than 0.20. Items with low coefficients should be removed from the scale.[15] This study found that item-total score correlation coefficient of the MDS 18-item finalized version ranged between 0.22 and 0.59.

3.2.2 | Test-retest

The test-retest method was used to determine the ability of the MDS to provide consistent results between the administrations, time invariance, and reliability (n = 110).[15,16] There was no statistically significant difference between first and second administrations in terms of the MDS total ($t = 0.06$, $P = .95$), internalizing ($t = -0.19$, $P = .85$), and externalizing ($t = 1.43$, $P = .16$) scores ($P > .05$). This result showed that this measurement tool was time invariant.[15,16]

4 | DISCUSSION

The suitability of the MDS, which was developed by Magovcevic and Addis[10] to measure psychometric properties and masculine depression symptoms of Turkish male university students, was analyzed, and the results were discussed in the context of the relevant literature.

4.1 | Assessment of scale validity

EFA and CFA were used to test the structural validity of the measurement tool. There was no limitation of factor number in the first stage, and nine factors with an eigenvalue higher than 1.00 were observed. There were 13 factors during the first stage of

development of the MDS, then, the factor structure of the MDS was assumed to be a 2-factor solution based on the scree plot.[10] Similarly, in the present study, the scree plot was analyzed, the factor number was limited as in the original scale development study, and EFA was carried out again. The EFA results showed that items of the subscales were distributed in line with the items in the original form of the scale. In the literature, it is determined that the factor load should be at least 0.45 and above.[15] Items can be removed if it is necessary according to the analysis result, and the analysis can be carried out again. This process continues until the researcher has an adequate item number to measure the field intended to be measured.[15,17] Therefore, items with factor loads higher than 0.50 were included in this study, and the "Principal Component Analysis" was preferred as a factor removal method.[16] As a result of the EFA, the number of items was decreased from 44 to 18. These 18 items were categorized under two factors and their factor loads were higher than 0.50 (Table 1). According to the literature, 30% or higher explained variance is sufficient in single-factor scales; however, it should be even higher in multi-factor scales.[15] The scale items (44 items) of the original study of MDS accounted for 46% of the total explained variance.[10] In the present study, the explained total variance was 51.94% for all items (18 items) of the MDS (Table 1) and this showed that factor structure of the scale was strong.

CFA was carried out on the data set to test whether the factor structure of this study was different from the factor structure of the original measurement tool.[16] The CFA results confirmed that the scale was formed of two factors: internalizing and externalizing. According to the Fit Indices regarding the structure formed, the model showed a good-fitting; therefore, the two-factor structure was maintained.[16,17]

However, the analysis of the 18-item structure of the MDS indicated that the items regarding these symptoms included in the internalizing subscale were as follows: avoiding family/social interaction, emotional constraint, inability or unwillingness to experience/express soft emotions, loss of interest in success, aches and pain, difficulty in concentrating, concern for the future, self-criticism/sense of failure/weakness, and accusation/disappointment. However, items regarding the change in sexual desire (decreased), difficulty in decision-making and stress intolerance symptoms were excluded from the internalizing subscale.[10] Analysis of the contents of the items under the externalizing subscale indicated that items regarding anger, aggression, irritability, over-focus on work/school, change in sexual desire (increased), need for self-determination/self-confidence, burden/disillusionment symptoms were excluded, and only the items regarding alcohol/substance addiction symptoms were kept.[10]

Men experience and express depression symptoms in different ways than women; they may tend to use alcohol and/or substance to handle emotional problems rather than being sad, which is a typical depressive symptom.[8] According to World Health Organization (WHO), use of alcohol is a greater risk factor for deaths between the ages of 20 and 39, and 7.7% of male deaths are related to alcohol use.[21] Moreover, studies show that university

students consume more alcohol and have more alcohol-related problems than their peers that are not students.[22] The MDS has an 18-item structure; and item contents in the externalizing subscale can be associated with the participants' mean age and the fact that 34.6% of the students were consuming alcohol. The participants' mean age was 35.75 ± 12.05 in the original study of the scale.[10] The overall alcohol consumption rate ranges from 9.3% to 16.5% among university students in Turkey.[23] This rate is 77% to 80% among American university students.[24] There are differences between Turkish and American cultures in terms of alcohol consumption based on the beliefs and values in these cultures. Generally, even as social drinking, alcohol consumption is considered negative behavior in Turkish culture. Moreover, this may also result from cultural characteristics; as the items of the MDS in the development study measures only the commitment to dominant hegemonic masculinity ideologies defined in Western culture,[10] and the hegemonic masculinity ideologies in the Turkish culture do not correspond with those items and are differently expressed. There are different masculinity forms which can be associated with men's styles of experiencing, expressing, and reacting to depression, and can change in cultural, racial, and ethnic terms.[25] The results indicate a factor structure similar to the original version. Correlation coefficients calculated for the language validity of the original scale show that the Turkish version of the scale was well understood by the participants. However, the number of items may be different because the sample was limited by a young population and the cultural factors.

The analysis regarding the convergent validity showed that there was a significant relationship between the MDS and the BDI,[15] and the correlation values were very similar with the values in the original study.[10] According to the results regarding the correlation between the MDS and the BDI, men who have typical depression at high levels may display more internalized and externalized symptoms.

4.2 | Assessment of scale reliability

The Cronbach's α internal consistency coefficients of the scale scores were found to be .91, .92, and .74, which proved that the scale had internal consistency. In the original scale development study, Cronbach's α coefficients were found to be .96 and .77 for the internalizing and externalizing subscales, respectively. In the present study, the scale measurements showed reliability and the reliability coefficients were similar to the reliability coefficients of the original form.[10] The result of test-retest analysis, which was carried out at 2-week intervals, showed that there was no statistically significant difference in terms of the scale scores ($P > .05$). This result shows that the MDS can provide accurate results each time it is administered, and that it is time invariant and reliable.[15,16] The results show that the MDS is a homogeneous and reliable measurement tool and its items have a high correlation with the scale and its subscales.[16]

The MDS has an 18-item and 2-factor structure and is applicable to assess the properties of masculine depression in Turkish male university students.

5 | LIMITATIONS AND RECOMMENDATIONS FOR RESULTS

One of the most significant limitations of this study is that the study results consisted of the data obtained from the research group. Therefore, it may not be possible to generalize the study results to all male university students or men of similar ages. Adopted masculine cultural norms and/or their culture affect how young, middle-aged, and elderly men experience and express depressive symptoms. As there are no other studies on this subject in Turkey, the validity and reliability of the MDS can be tested on a larger sample to increase generalizability of the results. Moreover, it will be beneficial to assess the factor validity of the scale with a larger sample that has commitment to masculinity ideologies at various levels and has different cultural characteristics. The use of measurement tools in clinics should also be assessed. Despite these limitations, this study is important as it is the first study about young men's experience of depression symptoms, enables a better understanding of depression in young individuals, and guides future studies for identifying depression. It is considered that the study provided the relevant literature with a valid and reliable measurement tool.

6 | IMPLICATIONS FOR NURSING PRACTICE

Male participants can experience depressive symptoms in a different way than the present diagnosis criteria. The scale presented here is an efficient measurement tool that can be used in the evaluation of masculine depressive symptoms and the planned health programs for male university students. Accurate evaluations by psychiatric nurses of the expression of depressive symptoms related to the adopted masculine ideologies will positively affect the quality of care of young adult men.

CONFLICT OF INTERESTS
The authors declare that there are no conflict of interests.

DISCLOSURE
This study was partly submitted in "V. International, IX. National Psychiatric Nursing Congress, Antalya/Turkey 2018, 20 to 23 November" as an oral presentation. This study was carried out as a part of the Master's thesis titled "The investigation of the relationship between depression, role norms and psychological help seeking attitudes in male university students" (Erkek üniversite öğrencilerinde depresyon, rol normları ve psikolojik yardım arama tutumu arasındaki ilişkinin incelenmesi).

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