

Validity and Reliability of the Turkish Male Andropause Symptoms Self-Assessment Questionnaire

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INTRODUCTION

Andropause, which consists of the Greek words “*andras*: Male human” and “*pause*: Stop,” is defined as a “syndrome” characterized by physical and emotional changes that occur due to a decrease in male hormones.^[1] Andropause was first described by August Werner in 1939 with the term “*climacterium virile*.”^[2] The Andropause Society considers andropause as testosterone deficiency, a common and significant problem in men over 40 years of age.^[3] As age progresses, gonadal functions decrease in both men and women. Despite the loss of reproductive functions with the sudden decrease in estrogen levels in

women, reproductive functions can continue in men even at advanced ages.^[4]

Many symptoms such as loss of energy, muscle weakness, depressed mood, decreased libido, erectile

ABSTRACT **Objective:** This study was planned to examine the validity and reliability of the Turkish version of the Male Andropause Symptoms Self-Assessment Questionnaire (MASS-Q). **Materials and Methods:** One hundred and twenty-five men with a mean age of 54.24 ± 6.51 years participated in the study. First, participants' demographic data were recorded. Then, the MASS-Q was adapted to Turkish. The assess the reliability and validity of the Turkish MASS-Q, internal consistency, test-retest reliability, and criterion validity analyses were administered. For the reliability test, the scale was readministered 1 week later. Test-retest reliability was examined with the intraclass correlation coefficients (ICCs). Internal consistency was defined by Cronbach's alpha. Regarding the validity analysis, content validity was determined according to expert opinions. For criterion validity, the Aging Male Symptoms-Questionnaire (AMS-Q) was used. **Results:** According to the results of the analysis, the ICC values between the test–retest scores of the total and subdimensions (sexual, somatic, psychic, and behavior) of the MASS-Q were found to be 0.987, 0.939, 0.973, 0.951, and 0.887, respectively ($P < 0.05$). Cronbach's alpha values of the total and subdimensions (sexual, somatic, psychic, and behavior) of the MASS-Q were calculated as 0.924, 0.870, 0.747, 0.865, and 0.667, respectively. According to the ICC values obtained, it was found that the MASS-Q had a high degree of reliability. According to the internal consistency results, the sexual and psychic subdimensions were found to be quite reliable, whereas the somatic and behavioral subdimensions were found to be sufficiently reliable. According to the criterion validity results, a very high and high correlations were found between the AMS-Q scores and the MASS-Q scores ($r = 0.636–0.938$, $P = 0.001$). **Conclusion:** As a result, it was determined that the Turkish version of the MASS-Q is a valid and reliable scale that can be used in Turkish men.

KEYWORDS: Andropause, questionnaire, reliability, validity

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dysfunction, increased body fat rate, osteopenia, and osteoporosis seen in men in the andropause period are associated with decreased testosterone levels.^[5,6] Andropause is defined as a natural process in the sexual functions of the aging man, as well as the decrease in sexual functions due to the decrease in testosterone levels.^[7-9] Although testosterone levels in men decline at similar rates with aging, the main reason for the variability of symptoms is thought to be due to individual differences in testosterone levels produced in healthy men.^[10]

According to the European Male Ageing Study, a total testosterone level of <11 nmol/L, a free testosterone level <220 pmol/L, and three sexual symptoms (decreased libido, impaired morning erections, and erectile dysfunction) in the presence of aging can be considered the minimum criteria for the diagnosis of andropause in men.^[11-13]

The vast majority of men do not accept andropause because of the negative social definitions associated with some symptoms of andropause.^[3,14,15] Due to a lack of knowledge and awareness, both men and women have some difficulty in expressing their sexual feelings or talking to others about their sexual behaviors, but this rate is higher in men.^[3,15,16] These issues are often considered embarrassing, confidential, and personal.^[14,17,18]

Studies in the literature have generally focused on the prevalence, definition, and treatment of menopausal symptoms in women.^[19] There is a need for comprehensive studies in both national and international literature on andropausal symptoms in men, which are characterized by symptoms similar to menopausal symptoms.^[19] The number of studies examining andropause symptoms is limited in the literature.^[20]

Many symptom-based scales, including the Androgen Decline in Aging Male Questionnaire (ADAM-Q), the Aging Male Symptoms-Questionnaire (AMS-Q), the European Male Aging Study-Short Form Questionnaire, and the Massachusetts Male Aging Study Questionnaire, have been developed to evaluate andropause in elderly men and to contribute to the diagnosis of andropause.^[21-23] Subjective scales such as the AMS-Q (96% sensitivity and 30% specificity) and the ADAM-Q (88% sensitivity and 44% specificity) are not sufficient alone in the diagnosis of andropause, due to their high sensitivity but low specificity, and also they should be supported with laboratory measurements.^[13,24,25]

“The Male Andropause Symptoms Self-Assessment Questionnaire” (MASS-Q), one of the questionnaires used to evaluate andropause symptoms, was designed to

measure andropause symptoms that develop due to aging in men.^[26,27] The 25-item MASS-Q, developed in 2012, was considered to be a valid and reliable screening test as much as the 17-item AMS-Q. The most important feature of the MASS-Q is its versatile assessment of the person sexually, somatically, psychologically, and behaviorally.^[20] In addition, the MASS-Q provides more useful and easily accessible results for clinicians and researchers involved in the evaluation of andropause symptoms, clinical diagnosis, and treatment of andropause. Therefore, our aim was to investigate the validity and reliability of the Turkish version of the MASS-Q.

MATERIALS AND METHODS

Participants

We invited 135 men presented to Unit of Physiotherapy and Rehabilitation in Pelvic Health and Women’s Health. Men who did not have any mental problems, aged 40–70, were literate, had late-onset hypogonadism, and signed the informed consent form were included in the study. Those who had cooperation problems in filling out the research scales, were not in the andropausal age range, had surgical andropause, were illiterate, and did not voluntarily participate in the study were not included in the study. According to the eligibility criteria, 6 men who refused to participate in the study, 3 men who refused to complete the application phase, and 1 illiterate man were excluded from the study. With the remaining 125 men, the study was completed. This number was deemed sufficient according to the rule of “sample size should be at least 5 times the number of items in the scale” in the literature.^[28,29] The study protocol was approved by Noninterventional Clinical Research Ethics Committee (October 24, 2018, GO18/1005-15). All participants were informed about the study protocol based on the Declaration of Helsinki, and signed informed consent was obtained from all participants before the study.

Cultural adaptation stages

Permission to use the scale in the present study was obtained from Abdolrahim Asadollahi. To determine the validity and reliability of the MASS-Q in the evaluation of andropause symptoms, it was first adapted into Turkish. The following stages were followed in the translation and cultural adaptation process of the scale:^[30,31]

Phase 1: First, the MASS-Q was translated from English to Turkish by two translators whose mother tongue is Turkish, one from the field of health and one from the field of nonhealth.

Phase 2: Two different translations of the scale (T1 and T2) were interpreted by the researchers, and the final Turkish version (T12) was created.

Phase 3: The final Turkish version of the scale (T12) was translated back into English by two independent translators whose mother tongue is English and who can speak Turkish.

Phase 4: The two different English translations (B1 and B2) obtained were interpreted and the final English version was created (B12) and compared to the original English version of the scale in terms of the suitability of the terminology.

Phase 5: The final Turkish version of the scale was applied to approximately 25 participants to test whether there was any difficulty in comprehensibility of the questions and answers in the scale.

Phase 6: In the last stage, the authors who developed the scale were contacted and informed about the adaptation process, their approval for the Turkish version was obtained.^[30]

During the translation stages, it was deemed appropriate not to use the word “male” in the translation, since the word “male andropause” in the title of the scale did not comply with Turkish grammar rules and caused expression disorder. Considering that andropause is a condition that can only be defined in men, and it is also called “male menopause” in the literature, it is seen that it is not necessary to use andropause together with the word “male.”

Evaluations

Demographic and physical characteristics (age, weight, height, education level, employment status, and marital status) and medical histories (chronic disease status and age of onset of andropause symptoms) were recorded. The Turkish MASS-Q and the AMS-Q, which will be used to examine the criterion validity of the MASS-Q, were administered in all 125 participants. It is recommended to retest approximately 5% of the total sample size in the evaluation of test–retest reliability.^[32] Therefore, after 7 days, the MASS-Q was administered in randomly selected 25 men to evaluate the invariance over time, which is an indicator of the reliability of the scale, and thus, the retest data were collected.

Male Andropause Symptoms Self-assessment Questionnaire

The MASS-Q is a comprehensive 25-item scale developed to evaluate andropause symptoms in men in the andropause period. The scale evaluates the person in terms of 4 factors as sexual “19, 22, 23, 24, 25,” somatic “2, 3, 9, 10, 13, 14, 17, 18, 20,” psychic “1, 6,

7, 8, 11, 12, 16,” and behavioral “4, 5, 15, 21.” Each item score ranges from 1 to 5. As the score increases, the level of influence of the person increases. A final score of <40 means that “You probably do not need testosterone therapy,” 40–84 means that “You may benefit from testosterone therapy,” and a score of more than 85 means that “You will most likely benefit from testosterone replacement therapy.” This scale was developed by Asadollahi *et al.* and its validity and reliability in English were demonstrated.^[20]

Cronbach’s α value of the scale was calculated as 0.89 and criterion validity was calculated as 0.67 by Asadollahi *et al.* The exploratory factor analysis results showed that the 25 items of the MASS-Q were divided into four factors (sexual, somatic, psychic, and behavior) explaining 83% of the variance of the scale.^[20] In model evaluation, normed fit index, comparative fit index, goodness-of-fit index, incremental fit index, and adjusted goodness-of-fit index values were calculated [NFI (Normed Fit Index) =0.91, CFI (Comparative Fit Index) =0.97, GFI (Goodness of Fit Index) =0.91, IFI (Incremental Fit Index) =0.94, and AGFI (Adjustment Goodness of Fit Index) =0.92, respectively].^[20] The fact that these values are >0.90 and close to 1 refers to the goodness and suitability of the model.^[20,33] As a result, it was reported that the original version of the MASS-Q is a valid and reliable measurement tool in the evaluation of andropause symptoms in Iranian population.^[20]

Aging Male Symptoms Questionnaire

The Turkish validity and reliability of the scale, which we used as the gold standard in our study, were established by Cangüven *et al.*^[34] It is a scale used in the evaluation of andropause symptoms seen in men in the andropausal period.^[34] The scale has 17 items, and a score between 1 and 5 is given for each item. If the total score is between 17 and 26, the person does not have symptoms, any score between 27 and 36 means low, 37 and 49 means moderate, and over 50 means severe symptoms.^[34]

Statistical analysis

Descriptive values of the obtained data were presented as median (interquartile range) and number (N, %). The conformity of the data to the normal distribution was evaluated with the Kolmogorov–Smirnov test. The relationship between subdimensions and total scores and quantitative demographic data was analyzed by the Spearman’s correlation analysis. Differences in subdimensions and total scores compared to groups in demographic data were analyzed with Mann–Whitney *U* and Kruskal–Wallis tests. The Bonferroni test was used for multiple comparisons. For the test-retest reliability, the compatibility between the two measurements were calculated by the Intraclass Correlation

Coefficients (ICCs). In the “ICC” interpretation 0.80–1.00 indicates “very good repeatability,” 0.60–0.79 indicates “significant repeatability,” 0.40–0.59 indicates “moderate repeatability,” 0.20–0.39 indicates “low repeatability,” and <0.20 indicates “very low repeatability.”^[35] Internal consistency coefficients were calculated by Cronbach’s alpha for the sub-dimensions. Cronbach’s α values were categorized as follows: ($0.00 \leq \alpha < 0.40$) unreliable, ($0.40 \leq \alpha < 0.60$) low reliable, ($0.60 \leq \alpha < 0.80$) sufficiently reliable, and ($0.80 \leq \alpha < 1.00$) quite reliable.^[36,37] In the interpretation of the α value calculated for the total reliability of the scale, any $\alpha > 0.70$ was taken as the reference value.^[36] In terms of correlation coefficients (r), the following classifications were assumed: ($0.80 \leq r < 1.00$) very high correlation, ($0.60 \leq r \leq 0.79$) high correlation, ($0.40 \leq r \leq 0.59$) moderate correlation, ($0.20 \leq r \leq 0.39$) weak correlation, and ($r < 0.20$) very weak correlation or no correlation. Statistical significance level was accepted as $P < 0.05$. IBM SPSS (Statistical Package for the Social Sciences; Chicago, IL, USA) Statistics version 22 software was used for the statistical evaluation of the obtained data.

RESULTS

A total of 135 men were interviewed for the study. Ten of the men did not meet the inclusion criteria (refused to participate in the study [$n = 6$], refused to complete the implementation phase [$n = 3$], and illiterate [$n = 1$]). The remaining 125 men complied with the protocols and completed the study. The mean age of the men was 54.24 ± 6.51 years, the mean body mass index (BMI) was 27.36 ± 3.42 kg/m², and the mean age of onset of andropause symptoms was 50.46 ± 6.37 years. The demographic and physical characteristics and medical histories of the participants in the study are shown in Table 1.

Reliability test

Internal consistency coefficients and intraclass reliability coefficients (ICC) were calculated to evaluate the reliability of the Turkish MASS-Q and are shown in Table 2. The MASS-Q total (Cronbach’s α : 0.924) and the sexual and psychic subdimensions (Cronbach’s α : 0.870, 0.865, respectively) were “quite reliable.” The somatic and behavioral subdimensions of the MASS-Q (Cronbach’s α : 0.747, 0.667, respectively) were “sufficiently reliable.”^[36]

The mean total score of the MASS-Q was 35.48 ± 2.59 at baseline and 36.48 ± 2.37 at retest. The test–retest reliability showed “very good repeatability” for the subdimensions (sexual, somatic, psychic, and behavior) (ICC values: 0.939, 0.973, 0.951, 0.887,

Table 1: Demographic and physical characteristics and medical histories ($n=125$)

Variables	Total ($n=125$)
Physical properties	X \pm SD
Age (years)	54.24 \pm 6.51
BMI (kg/m ²)	27.36 \pm 3.42
Age of onset of andropause symptoms (years)	50.46 \pm 6.37
Education level	
Lower than higher education	85 (68)
Higher education and beyond	40 (32)
Working status	
Working	85 (68)
Not working	40 (32)
Marital status	
Married	115 (92)
Single	1 (0.8)
Divorced	9 (7.2)
Chronic disease status	
Yes	78 (62.4)
No	47 (37.6)

n : Sample size, X: Mean, SD: Standard deviation, BMI: Body mass index

respectively) and the total score (ICC: 0.987) of the MASS-Q ($P < 0.001$).

Content validity

Content validity is related to whether the questions in the scale are suitable for the purpose of evaluation and are determined according to the “expert” opinions. The expert group should consider for what purpose the scale was prepared and whether it can represent this purpose and content. Any scale should be used after it is revised based on expert opinions.^[38] The Turkish adaptation of the MASS-Q was examined by 3 experts in their fields, and it was stated that there were no questions that needed to be removed or added, and that the expressions were simple and understandable. Thereupon, it was decided that the MASS-Q had content validity.

Criterion validity

To determine the criterion validity of the Turkish adaptation of the MASS-Q, we used the AMS-Q, which is accepted as the gold standard and measures all or some of the andropause symptoms measured in sexual, somatic, psychic, and behavioral subdimensions. The relationships between the total and subdimension scores obtained from this measurement tool and the total and subdimension scores obtained from the MASS-Q were examined and the findings are presented in Table 3.

According to the results, a “very high correlation” was found between the MASS-Q sexual subdimension and the AMS-Q sexual subdimension ($r = 0.889$). A “very high correlation” was found between the MASS-Q somatic subdimension and the AMS-Q somatic

Table 2: Internal consistency and test–retest reliability and descriptive statistics of the Male Andropause Symptoms Self-Assessment Questionnaire

MASS-Q total and subdimensions	Re-test (<i>n</i> =25)			ICC	Internal Consistency (<i>n</i> =125) Cronbach's alpha value
	MASS-Q points (X±SD)	Median (IQR)			
Total	35.48±2.59	36.48±2.37	31 (32)	0.987	0.924
Sexual	8.32±0.90	8.84±0.84	7 (7)	0.939	0.870
Somatic	12.4±0.89	12.28±0.85	11 (11)	0.973	0.747
Psychic	9.24±0.65	9.16±0.57	8 (8)	0.951	0.865
Behavioral	5.52±0.41	6.2±0.38	5 (6)	0.887	0.667

n: Sample size, X: Mean, SD: Standard Deviation, ICC: Intraclass correlation coefficient, MASS-Q: Male Andropause Symptoms Self-Assessment Questionnaire, IQR: Interquartile range

Table 3: Criterion validity of the Male Andropause Symptoms Self-Assessment Questionnaire

	rho	P
MASS-Q sexual subdimension – AMS-Q sexual subdimension	0.889	0.001*
MASS-Q somatic subdimension – AMS-Q somatic subdimension	0.851	0.001*
MASS-Q psychic subdimension – AMS-Q psychological subdimension	0.777	0.001*
MASS-Q behavioral subdimension – AMS-Q psychological subdimension	0.636	0.001*
MASS-Q total score – AMS-Q total score	0.938	0.001*

**P*<0.05. MASS-Q: Male Andropause Symptoms Self-Assessment Questionnaire, AMS-Q: Aging Male Symptoms Questionnaire, rho: Spearman's correlation test, *P*: Statistical significance level

subdimension ($r = 0.851$). A “high correlation” was found between the MASS-Q psychic subdimension and the AMS-Q psychological subdimension ($r = 0.777$). A “high correlation” was found between the MASS-Q behavioral subdimension and the AMS-Q psychological subdimension ($r = 0.636$). A “very high correlation” was found between the MASS-Q total score and the AMS-Q total score ($r = 0.938$).

DISCUSSION

This study showed that the Turkish version of the MASS-Q, which was developed to evaluate andropause symptoms in men, is valid and reliable for use in Turkish men with andropause.

Apart from the original version of the MASS-Q, there is no other version study investigating its validity and reliability. Therefore, this study is the first to evaluate the validity and reliability of the MASS-Q using the andropause-specific AMS-Q.

The validation study of the original version of the MASS-Q included 382 men aged 50–80 years, with a mean age of 65.3 ± 2.32 years.^[20] In our study, 125 men aged 40–70 years with a mean age of 54.24 ± 6.51 years were included. The relationship between andropause symptoms and the age of the individuals was examined, and a positive relationship was found only between the MASS-Q sexual subdimension score and age ($r = 0.250$, $P = 0.005$). In other words, it was concluded that the severity of sexual symptoms of andropause such as loss of libido, low energy, decrease in the number of

morning erections, decrease in sexual activity frequency, or performance increases with aging.

No correlation was found between andropause symptoms and height, weight, and BMI of the subjects. Although there are studies in the literature that do not support our results, there are also a few studies that support our results. Therefore, in response to this contradictory outcome in the literature, we think that more studies should be conducted on this subject.

Cross-cultural adaptation is among the standardized methods for comparing and interpreting scales at both national and international levels.^[39] Cultural adaptation should be carried out by following the adaptation and validation processes were carried out following previous studies.^[30,39,40]

Within the scope of content validity, following the completion of the translation process, the items and answers of the MASS-Q were reviewed by experts in their fields. The fact that the expressions in the scale are suitable for the purpose of the measurement without the need for terminology explanation shows that the content validity of the scale is good.

In our study, the reliability of the scale was evaluated by test–retest and internal consistency method. The test–retest reliability of the MASS-Q total and subscale scores was high (ICC values; total score 0.987 and subdimensions between 0.887 and 0.973). It was found that similar results were obtained at two separate administrations of the scale in the same people in

different time periods, and thus the invariance of the scale with respect to time was revealed. ICC values were not calculated in the original version of the scale.^[20]

The internal consistency of the scale was evaluated with the Cronbach's α coefficient, and the Turkish MASS-Q total score Cronbach's α coefficient was found to be 0.924, while the Cronbach's α coefficients of the Turkish MASS-Q subdimensions were found to vary between 0.667 and 0.870. Internal consistency results showed that the total and the sexual and psychic subdimensions of the MASS-Q were quite reliable, while the somatic and behavioral subdimensions were sufficiently reliable.^[36]

Criterion validity was tested with the AMS-Q, the most used measurement tool to evaluate andropause symptoms. A positive and very high correlation was found between the MASS-Q and the AMS-Q total scores ($r = 0.938$). A very high correlation was found between the AMS-Q somatic subdimension score and the MASS-Q somatic subdimension score ($r = 0.851$). A high correlation was found between the AMS-Q psychological subdimension score and the behavior subdimension score of the MASS-Q ($r = 0.636$). These results show that the scale is compatible within itself, and that sufficient criterion validity is provided.

It was stated that the internal consistency coefficient (Cronbach's alpha) calculated for the reliability of the original version of the MASS-Q was 0.89.^[20] We also calculated the internal consistency coefficient (Cronbach's alpha) of the MASS-Q as 0.92. While the criterion validity value of the MASS-Q was specified as 0.67 in the original study,^[20] we found the criterion validity value of the MASS-Q as 0.94 in our study. As a result, we can say that the MASS-Q is as valid and reliable as the original version, and it is suitable for use in Turkish society.

This scale will help determine if men are suffering from andropause and whether testosterone therapy should be considered a treatment option.^[20] Andropause is often associated with a low testosterone condition that begins to appear in men around age 40. Andropause is often misdiagnosed or not diagnosed at all for a variety of reasons. The primary reason for this is that the severity and frequency of symptoms can vary significantly from man to man. Many men find it difficult to accept that there may be a problem and refrain from talking about the symptoms.^[20] For this reason, the use of scales in the evaluation of andropause symptoms is of great clinical importance.

The Turkish version of the MASS-Q, which evaluates andropause symptoms in men with detailed questions

regarding sexual, somatic, psychic, and behavioral aspects, helps the clinical diagnosis of andropause by providing information and awareness about andropause, and enables the symptoms to be evaluated easily and cost-effectively. One of the strengths of our study is that this valuable tool has been introduced to the literature to be used in Turkish population. Another strength of our study is that it provides resources for the comfortable use of the scale in the clinic.

The limitation of our study is the measurement of andropause symptoms only with scales, which is a subjective method. Andropause symptoms that may develop due to testosterone deficiency were not assessed by laboratory measurements. However, the scales used are valid and reliable scales that are widely used in the evaluation of andropause symptoms. Further studies are needed for the diagnosis of andropause in which the symptoms are assessed not only by symptomatic measurement methods but also by objective methods such as laboratory measurements.

CONCLUSION

The MASS-Q was found to be a valid and reliable scale for measuring the signs of aging andropause in Turkish men.

We suggest planning new studies on the sensitivity and specificity of the Turkish MASS-Q.

We think that the difficulties experienced in recruiting patients during the study are due to the society's social knowledge and awareness about andropause was not at a sufficient level. To provide early diagnosis and treatment in andropause and to encourage men to easily visit clinics for andropause-related problems, informative trainings on andropause should be expanded to reach all segments of the society.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Singh P. Andropause: Current concepts. *Indian J Endocrinol Metab* 2013;17:S621-9.
2. Marshall BL. Rejuvenation's return: Anti-aging and re-masculinization in biomedical discourse on the 'aging male'.

- Med Stud 2009;1:249-65.
3. Harrison J. 'Talking about my generation': A state-of-the-art review of health information for men in the andropause. *Health Info Libr J* 2011;28:161-70.
 4. Vermeulen A. Andropause. *Maturitas* 2000;34:5-15.
 5. Hirokawa K, Taniguchi T, Fujii Y, Takaki J, Tsutsumi A. Modification effects of changes in job demands on associations between changes in testosterone levels and andropause symptoms: 2-year follow-up study in male middle-aged Japanese workers. *Int J Behav Med* 2016;23:464-72.
 6. Vieira MC, Leitão AE, Vieira G, Moratelli J, Boing L, Seemann T, *et al.* Concurrent training protocol for men with androgen deficiency in the aging male: A randomized clinical trial. *Aging Male* 2018;21:149-57.
 7. Pabuçcu R, Kaya C. Testosterone and andropause: The effect of testosterone therapy. *Turk Klin Tip Bilimleri Derg* 2008;28 (Supplement):98-101.
 8. Sade G, Özkan H, Mucuk Ö. Male Reproductive Health Problems and Midwifery Approaches. *Archives Medical Review Journal* 2019;28:253-8.
 9. Ötünçtemur A, Köklü İ, Dursun M, Özbek E. Geriatrics and Urology. *Okmeydanı Journal of Medicine* 2013;29:121-6.
 10. Ören M, Kızıltepe R, Özkes BÇ. Sexuality in elderly. *Ege Journal of Medicine* 2016;55 (Supplement):38-44.
 11. Pines A. Male menopause: Is it a real clinical syndrome? *Climacteric* 2011;14:15-7.
 12. Samaras N, Samaras D, Lang PO, Forster A, Pichard C, Frangos E, *et al.* A view of geriatrics through hormones. What is the relation between andropause and well-known geriatric syndromes? *Maturitas* 2013;74:213-9.
 13. Üzelpasacı E, Özgül S, Gürşen C, Akbayrak T. Physiotherapy and Rehabilitation in Andropause. In: Erbahçeci F, Yıldırım NÜ, editors. *Geriatric Physiotherapy and Rehabilitation*. Ankara: Hipokrat Bookstore; 2021. p. 429-61.
 14. Samipoor F, Pakseresht S, Rezasoltani P, Kazemnajad Leili E. Awareness and experience of andropause symptoms in men referring to health Centers: A cross-sectional study in Iran. *Aging Male* 2017;20:153-60.
 15. Abootalebi M, Vizeshfar F, Heydari N, Azizi F. Effect of education about andropause health on level of the knowledge and attitude of men referring to the education and training retirement Center of Shiraz. *Aging Male* 2020;23:216-21.
 16. Tereci D, Turan G, Kasa N, Öncel T, Arslansoyu N. An Overview of the Concept of Old Age. *Beyond the Horizon of Scientific Journal* 2016;16:84-116.
 17. Al-Sejari M. Awareness and knowledge of andropause among Kuwaiti males. *Journal of the Social Sciences* 2013;41:9-25.
 18. Güzel Ö, Demirel HC, Aslan Y. Sexual Life in Certain Periods of Male Life. In: Resim S, Kadioğlu A, editors. *Men's and Women's Sexual Health*. 8. İstanbul: Turkish Association of Urology; 2016. p. 251-66.
 19. Vardar O, Özkan S, Serçekuş P. Menopause and andropause: Similarities and differences. *Andrology Bulletin* 2020;22:129-36.
 20. Asadollahi A, Saberi LF, Faraji N. Validity and reliability of male andropause symptoms self-assessment questionnaire among elderly males in Khuzestan province of Iran. *J Midlife Health* 2013;4:233-7.
 21. Morley JE. Andropause, testosterone therapy, and quality of life in aging men. *Cleve Clin J Med* 2000;67:880-2.
 22. Abootalebi M, Kargar M, Aminsharifi A. Assessment of the validity and reliability of a questionnaire on knowledge and attitude of general practitioners about andropause. *Aging Male* 2017;20:60-4.
 23. O'Connor DB, Corona G, Forti G, Tajar A, Lee DM, Finn JD, *et al.* Assessment of sexual health in aging men in Europe: Development and validation of the European male ageing study sexual function questionnaire. *J Sex Med* 2008;5:1374-85.
 24. Morley JE, Charlton E, Patrick P, Kaiser FE, Cadeau P, McCready D, *et al.* Validation of a screening questionnaire for androgen deficiency in aging males. *Metabolism* 2000;49:1239-42.
 25. Taher A. Proportion and acceptance of andropause symptoms among elderly men: A study in Jakarta. *Acta Med Indones* 2005;37:82-6.
 26. Hakimi S, Ghasemi L, Mirghafourvand M, Hassanzadeh K, Ghasemi F. The prevalence of andropause symptoms and the role of social determinants of health on its severity in healthy men: A community-based study in Northwest Iran. *Crescent J Med Biol Sci* 2019;6:341-5.
 27. Rezaei N, Azadi A, Pakzad R. Prevalence of andropause among Iranian men and its relationship with quality of life. *Aging Male* 2020;23:369-76.
 28. MacCallum RC, Widaman KF, Zhang S, Hong S. Sample size in factor analysis. *Psychol Methods* 1999;4:84.
 29. Seçer İ, Halmatov S, Gençdoğan B. Emotional Reactivity Scale Adaptation to Turkish: Reliability and Validity Study. *Sakarya University Journal of Education*. Sakarya Univ J Educ 2013;3:77-89.
 30. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976)* 2000;25:3186-91.
 31. Çapık C, Gözüm S, Aksayan S. Kültürlerarası ölçek uyarlama aşamaları, dil ve kültür uyarlaması: Güncellenmiş rehber. *Florence Nightingale J Nurs* 2018;26:199-210.
 32. Şencan H. Validity and reliability in social and behavioral measurements. First edition ed. Ankara: Seçkin Publishing; 2005.
 33. Sari E. Confirmatory factor analysis and application to wind energy scale. Bursa: Uludag University, Institute of Social Sciences; 2018.
 34. Cangüven Ö, Gürkan L, Horuz R, Albayrak S, Kadioğlu A. Aging male symptom questionnaire form: Turkish validity study. *Andrology Bulletin* 2005;21:93-8.
 35. Bi J, Kuesten C. Intraclass correlation coefficient (ICC): A framework for monitoring and assessing performance of trained sensory panels and panelists. *J Sens Stud* 2012;27:352-64.
 36. Kılıç S. Cronbach's alpha reliability coefficient. *Journal of Mood Disorders* 2016;6:47-8.
 37. Külçür İ, Çelik AS. Validity and Reliability of Turkish Version of the Antenatal Perceived Stress Scale. *Erzurum: Atatürk University, Graduate School of Health Sciences*; 2016.
 38. Karasar N. *Scientific Research Method: Concepts, Principles, Techniques*. Ankara: Nobel Academic Publishing; 2007.
 39. Gjersing L, Caplehorn JR, Clausen T. Cross-cultural adaptation of research instruments: Language, setting, time and statistical considerations. *BMC Med Res Methodol* 2010;10:13.
 40. Aksayan S, Gözüm S. A guide for trans-cultural scale adaptation I: steps of a scale adaptation and psycholinguistic adaptation. *Turkish Journal of Nursing Research* 2002;4:9-14.