European Journal of Integrative Medicine 55 (2022) 102178

Contents lists available at ScienceDirect

European Journal of Integrative Medicine

journal homepage: www.sciencedirect.com/journal/european-journal-of-integrative-medicine

Research paper

Psychometric properties of the Turkish version of the attitudes toward massage (ATOM) scale

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ARTICLE INFO

Keywords:
Massage
Massage scale
Questionnaire
Psychometric properties

ABSTRACT

Introduction: The use of massage, which may be part of the care administered to an individual, is increasing. Massage is known to affect physiological and psychological factors. Individuals' attitudes and expectations also affect care outcomes. However, there is no validated tool to evaluate these factors. In this study, the psychometric properties of the Turkish version of the attitudes toward massage (ATOM) scale were evaluated.

Methods: The sampleconsisted of 250 undergraduate nursing students. The language, content validity, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) were used to assess the validity of the scale. The reliability of the scale was tested using Cronbach's alpha coefficient, a paired samples t-test, and item-total and item-subdimensions score correlation, and Hotelling's T-squared test.

Results: The scale consisted of two sub-dimensions, which explained 53.80% of the variance. All the factor loadings were >0.30 in the factor analysis. In CFA, all the fit indices were >0.90, and the root mean square error of approximation (RMSEA) was 0.063. Cronbach's alpha was 0.76 for the overall scale. It was determined that the instrument had invariance according to time ($p > 0.05$). The instrument involved no response bias (Hotelling's T-squared = 699.586, $p < 0.001$).

Conclusions: The results of the study show that the Attitudes towards Massage Scale is a valid and reliable measurement tool for a Turkish sample.

1. Introduction

Massage, one of the oldest known treatment methods, is among complementary and alternative medicine. It is a general term for applications that reduce muscle tension, provide relaxation, and stimulate blood circulation in the tissues [1]. The use of massage among adults is on the rise. While 179 million massages were performed in the United States in 2017, this increased to 214 million in 2018. The American Massage Therapy Association (AMTA) 2019 report, stated that 16% of males and 21% of females had received massage [2]. According to the AMTA 2021 data, 25% of men and 21% of women had received a massage in the United States. In the same study, reasons for individuals receiving a massage were for relaxation, to reduce stress, feel good, and manage pain [3]. In Turkey, massage is not widely used in the health care field but its impact as a method has been investigated in scientific studies. Reviewing the literature in our country, failed to reveal any published reports on the use of massage.

According to the literature, massage has positive effects on psychological factors, such as stress, anxiety, and depression [4,5], and on physiological factors, such as vital signs, pain, nausea, vomiting, fatigue, itching, and sleep [6–9]. However, they do not include individuals' attitudes towards massage. Attitudes towards massage may vary depending on the person's gender, age, and massage experience. Thus, there is a need for an increase in studies and scales specific to this field [10]. Determining individuals' attitudes towards massage will contribute to the personal planning of their care, thereby improving physiological and psychological factors and care outcomes. There are only a few measurement tools developed in the literature to evaluate massage therapy. One of these tools is a scale developed in the US, which examines the relationship between clients' expectations from massage and its outcomes [11]. Another tool is The Inpatient Belief, Expectation, and Attitude toward Reflexology (IBEAR-16) scale, which was created by Attias et al. (2018) to examine inpatients' beliefs, attitudes, and expectations toward reflexology massage [12]. The ATOM is another scale constructed by Moyer and Rounds (2009) to determine attitudes toward massage [10]. In a study conducted with undergraduate students using the ATOM scale, the attitude of individuals according to their massage experiences was analyzed [13], while in another study, the impact of

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https://doi.org/10.1016/j.eujim.2022.102178
Received 10 May 2022; Received in revised form 7 August 2022; Accepted 8 August 2022
Available online 12 August 2022

massage on psychophysiological changes in the attitude towards massage was assessed [14]. In our country, however, there is no scale used to determine the attitudes of individuals towards massage. It was considered that a scale which could be developed in this domain would be helpful in both clinical and research fields. The present research was planned to investigate whether the ATOM was a valid and reliable measure for the Turkish population, as the number of items are fewer in this scale than other scales, it requires less time to fill out, it is not specific to a massage type, and the statements in the scale are short and clear. This scale can be used to evaluate individuals' attitudes toward massage.

2. Methods

2.1. Study design

A cross-sectional psychometric study was designed to investigate whether the attitudes toward massage scale (ATOM) was valid and reliable.

2.2. Participants and settings

This study was conducted between October-December 2019 with 250 nursing students from a nursing faculty in Turkey in the academic year 2019-2020. A generally accepted way for calculating the sample size when conducting a scale validity and reliability study is to multiply the count of scale items by at least five, ten, or fifteen so that factor analysis can be performed [15,16]. The ATOM scale was composed of 17 items, including nine items and eight supplementary items, 250 second and third-year nursing students who consented to take part in this research were included. This study did not include freshmen, as they had not taken the theoretical massage course yet, and seniors, as they were in the hospital as interns.

2.3. Data collection

Data collection tools included a descriptive information form and the ATOM. Before data collection, the participants in this study were provided with information on the objective of this research, and their consent (written and verbal) was obtained. The volunteer nursing students filled out the data scales, and 30 students were retested three weeks later.

2.4. Data collection tools

2.4.1. Information Form

The questions on this form are about participants' age, gender, income status, school year, place of residence, and the status of giving a massage and receiving a massage previously.

2.4.2. The Attitudes toward Massage Scale (ATOM)

This is a Likert-type scale consisting of nine items and eight supplementary items developed by Moyer and Rounds to evaluate attitudes toward massage. The scale has two sub-dimensions, namely, massage as healthful and massage as pleasant. The "massage as healthful" subdimension includes four items about the importance of massage in improving health and well-being. The "massage as pleasant" subdimension includes five items that reflect the pleasurable and mood-enhancing aspects of massage. The supplementary items of the scale include items, such as the count of massage people get and gender preference in massage therapy. The responses of the participants are evaluated on a 5-point assessment structure varying from 1(strongly disagree) to 5 (strongly agree). Scores on the scale range between 9 and 45. When the total points are calculated, the points of the supplementary items are not included. High scores show that people's attitudes towards massage are positive, while low scores show negative attitudes. The score of item 8 is reversed [10]. To our knowledge, no studies concerning the cross-cultural adaptation and psychometric validation of the instrument to different languages could be found in the literature.

2.5. Data Analysis

Descriptive data were presented in numbers, percentages, mean values. The SPSS version 22.0 and AMOS 25.0 were used to analyze the study data. $p<0.05$ was set as the significance level. Regarding the psychometric properties of ATOM, the method of forward and back translation was utilized to assess the language validity. The content validity of the scale was evaluated based on expert opinions. Then, the Content Validity Index (CVI) was calculated.

2.5.1. Phase 1: language validation

The written permission of the author who developed the scale was obtained to reproduce the ATOM scale. In the first stage, the forward translation and back-translation method was used to ensure the language validity of the scale. Two people, one of whom was a faculty member and the other was a translator, carried out the translation process independently. After the translations were completed, the researchers compared the two texts regarding linguistic, semantic, and contextual aspects and prepared the Turkish version of the measure according to the translations [17]. Another translator, who had no information about the scale, translated the Turkish form back into English. A comparison was made between the English translation and the original form, and then the Turkish form was organized. There was no semantic inconsistency between the original and the back-translation form of the scale.

2.5.2. Phase 2: content validity

The Lynn technique was used to calculate the content validity index [18]. At this stage, seven researchers, who were experts in the fields of massage therapies, evaluated whether the items on the scale were adequate and convenient for Turkish society. A 4-point Likert-type evaluation structure was used to assess the items, and the experts indicated their suggestions for an item if any revision was needed on the evaluation scale. The evaluations of the experts indicated that no correction or removal was needed. For each item score, an item-based content validity index (I-CVI) and for the overall score of the scale, a scale-based content validity index (S-CVI) was calculated. The items were finalized according to the opinions of experts, and the pilot test phase was started.

2.5.3. Phase 3: pilot testing

Following the calculation of the content validity, the finalized scale was piloted on 24 participants. The participants answered and evaluated the items regarding intelligibility. They answered the scale items and did not recommend any revision. The study sample did not involve these participants [17,19]. After pilot testing, the latest version of the measure was approved, and the next step was initiated.

2.5.4. Phase 4: psychometric examination

Explanatory and confirmatory factor analyses were utilized to achieve construct validity. Before starting the analysis, the normality of the data was analyzed, and multicollinearity was examined between the sub-dimensions. In exploratory factor analysis, the convenience and adequacy of the data set for factor analysis were tested by utilizing Kaiser–Meyer–Olkin (KMO) and Barlett's tests. Construct validity of the measure was determined using varimax rotation and principal component methods. Confirmatory factor analysis was conducted on the AMOS 25.0 software package. The estimation method was the maximum likelihood method. Factor loads and model fit indices were studied following confirmatory factor analysis.

The reliability of the scale was studied using test-retest (a paired samples t-test), item-total correlations, Cronbach's alpha, and

Hotelling's T-squared test for the response bias. The scale was performed twice with an interval of three weeks to assess the test-retest reliability on 30 students. In this study, the six supplementary items about sexuality and gender, which were not involved in the reliability and validity analysis of the ATOM as the authors of the original scale did, were analyzed using Pearson chi-square analysis.

2.6. Ethical considerations

Before this study was planned, the written permission of Moyer and Rounds was taken to adopt the ATOM scale into Turkish. Ethical approval (Decision no: 2019/16-03) was obtained from the University Non-Invasive Researches Ethical Committee. All students participating in this study submitted written and oral informed consent.

3. Results

The mean age of the participants was 20.16 ± 1.29 (min: 18-max.:26) years, 62% of them (n: 155) were female, 76.8% were 2ndyear students (n:192), 49.6% (n:124) had equal income and expenses, and 44.4% (n:111) lived in a city. Also, 68.8% (n: 172) of the participants had given a massage, and 55.2% (n:138) had received a massage previously (Table 1).

3.1. Validity-related findings

3.1.1. Content validity

Seven experts were consulted for the draft form of the scale. The I-CVI for 17 items and S-CVI was 1.00, according to the experts' opinions.

3.1.2. Construct validity

Explanatory factor analyses (EFA) and confirmatory factor analyses (CFA) were utilized to analyze construct validity. As a result of EFA, the KMO coefficient was 0.839, and Bartlett $\chi 2$ value was 637.991 and $p < 0.01$. Accordingly, the scale consisted of two sub-dimensions. The "massage as healthful" sub-dimension explained 30.51% of the total variance, and the "massage as pleasant" sub-dimension explained 23.27% of it. The two sub-dimensions together explained 53.80% of the total variance. The factor loads of the "massage as healthful" sub-dimension varied between 0.58 and 0.78, and they varied from 0.55 to 0.70 for the "massage as pleasant" sub-dimension (Table 2).

The CFA results indicated the fit indices as follows: $\chi 2 = 51.69$; df = 26; $\chi 2/df = 1.988$; RMSEA= 0.063; CFI = 0.95; GFI = 0.95; NFI = 0.92; TLI = 0.94; RFI = 0.89; and IFI = 0.95. The CFA results also showed that the factor loads of the "massage as healthful" sub-dimension varied from 0.41 to 0.78, and the factor loads of the "massage as pleasant" sub-dimension between 0.33 and 0.78 (Fig. 1).

Table 1
The sociodemographic characteristics of the participants.

Descriptive characteristics	(Mean ∓ SD)	
Age	20.16+1.29 (min.: 18, max.: 26)	
	n	**%**
Sex		
Female	155	62
Male	95	38
School year		
2	192	76.8
3	58	23.2
Income status		
Low	102	40.8
Middle	124	49.6
High	24	9.6
Place of residence		
Province	111	44.4
Country	102	40.8
Village	37	14.8
Status of applying a massage		
Yes	172	68.8
No	78	31.2
Status of receiving a massage		
Yes	138	55.2
No	112	44.8

Table 2
Explanatory factor analysis results of the attitudes toward massage scale (ATOM) (n: 250).

Items	Sub-dimensions	
	Massage as Healthful	***Massage as Pleasant***
1. Receiving massage is as good for the mind as it is for the body.	0.70	
2. Receiving regular massage would be good for promoting health and well-being.	0.78	
3. Massage is a serious form of therapy.	0.78	
4. Massage should be covered by health insurance.	0.58	
5. I like to be massaged.		0.70
6. Receiving massage is relaxing.		0.55
7. Receiving a massage would improve my mood.		0.63
8. Receiving a massage would make me nervous.		0.56
9. I like to be touched by other people.		0.70
Explained variance (%)	30.51	23.27
Explained total variance (%)	53.80	
Eigenvalue	2.747	2.095
Kaiser–Meyer–Olkin	0.839	
Bartlett $\chi 2$, P	637.991, 0.000	

3.2. Reliability-related findings

Cronbach's α reliability value of the total scale was 0.76, which was 0.66 for the "Massage as Healthful" sub-dimension and 0.69 for the "Massage as Pleasant" sub-dimension. The item-total correlation coefficient was analyzed to determine the correlation between each item and the total score. The item-total score correlations ranged from 0.26 to 0.68, and the item-sub-dimension score correlations ranged from 0.30 to 0.61 (Table 3).

According to the result of the test-retest analysis, no significant difference was determined between the total and sub-dimension scores of the scale obtained from the first and second applications of the scale (t=-0.665, p=0.51). The Pearson correlation coefficient was 0.83 between the two tests ($p<0.001$). The Pearson correlation coefficient for test-retest was 0.74 for the Massage as Healthful sub-dimension, and 0.69 for the Massage as Pleasant sub-dimension ($p<0.001$). According to Hotelling's T-squared test, the scale had no response bias (699.586, F = 84.990, and $p< 0.001$).

3.3. Massage attitudes associated with sexuality and gender

The findings showed that most of the females preferred their massage therapist to be of the same gender and that they felt more comfortable when given a massage by a woman ($p <0.001$). No significant difference was determined between males and females regarding fears that during a massage, they may become sexually aroused (p=0.15), and the females did not find getting a massage as sexually stimulating when compared to males ($p<0.001$) (Table 4).

4. Discussion

The translation of the ATOM scale from English into Turkish was carried out in the present study, and the translated version was tested for psychometric properties.

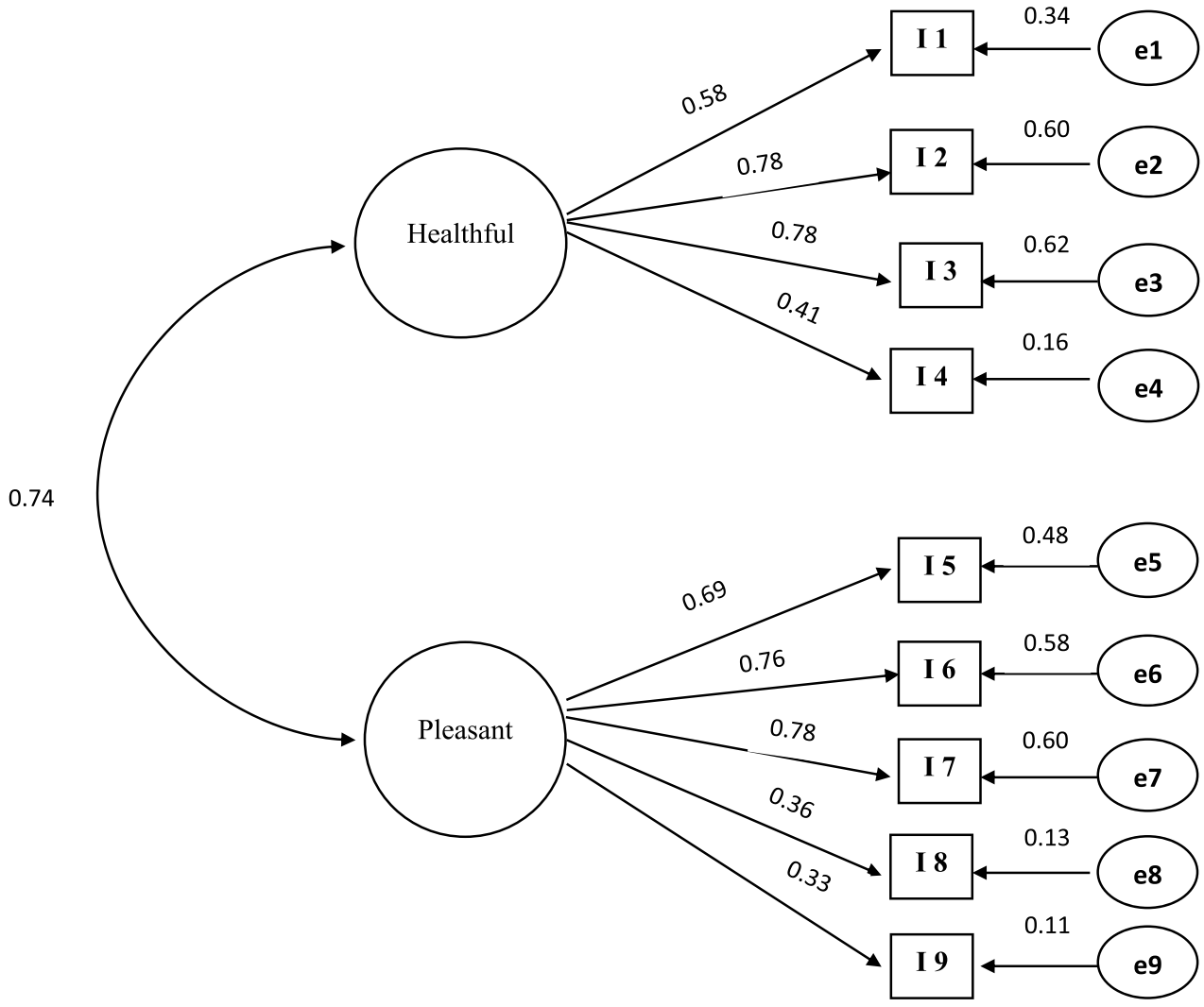

Fig 1. Attitudes toward Massage Scale PATH analysis.

Table 3
Item-total and item-sub-dimension total score correlations (n: 250).

Sub-dimensions	Items	Item-total score correlation(r)*	Item-sub-dimension total score correlation(r)*
Massage as Healthful	1	0.45	0.46
	2	0.35	0.54
	3	0.57	0.58
	4	0.30	0.35
Massage as Pleasant	5	0.55	0.57
	6	0.63	0.55
	7	0.68	0.61
	8	0.28	0.30
	9	0.26	0.33

* $p < 0.001$.

4.1. Validity

Content validity is often utilized to test the validity of measures [20]. In this study, S-CVI and I-CVI were utilized to assess the opinion of experts. I-CVI and S-CVI values were 1.00. Since the original study of the scale did not include a content validity analysis, no comparison could be made. It is reported that I-CVI and S-CVI values should be ≥0.78 and ≥0.90, respectively [21]. These results showed that the experts reached a consensus, the scale adequately measured the concept that was intended to be measured, and that content validity of the scale was achieved.

Bartlett's sphericity test and KMO coefficient were utilized to test the appropriateness of the data for factor analysis. The Bartlett Sphericity test value in the present study was $p < 0.001$, and a KMO value of 0.839 was found, which indicated that factor analysis could be conducted as the sample size of this study was adequate. Since the original study of the scale did not include Bartlett's sphericity test and KMO coefficient, no comparison could be made. It is emphasized in the literature that a statistically significant Bartlett Sphericity test value ($p < 0.05$) and a KMO value of at least 0.60 should be obtained so that perform factor analysis can be performed [22,23]. According to the result of the EFA, the scale had two sub-dimensions, and more than 50% of the total variance in the Turkish version was explained by these two sub-dimensions. It is recommended that the rate of explained variance for a multidimensional scale should be 50% or greater [22]. Similarly, the original form of the scale consisted of two sub-dimensions, as well. The variance explained in the original form of the scale was not reported.

According to the EFA result, the factor loads of the two sub-dimensions ranged from 0.55 to 0.78. These results showed that the items were highly correlated with their sub-dimensions and that the sub-dimensions could measure the concept to be measured. Factor loads of the original scale were also above 0.30 [10]. The EFA results showed

Table 4
Supplementary items for each gender.

Supplementary Items	Male	Female	p-value
	n (%) n=95 (38%)	n (%) n=155 (62%)	
I would prefer that my massage therapist be of the opposite sex.			
Disagree/Strongly Disagree -	18 (18.9)	114 (73.5)	88.067
Neutral =	39 (41.1)	37 (23.9)	**0.000**
Agree/Strongly Agree +	38 (40.0)	4 (2.6)	
I am afraid I might become sexually aroused during a massage.			
Disagree/Strongly Disagree -	42 (44.2)	88 (56.8)	3.731
Neutral =	32 (33.7)	40 (25.8)	0.15
Agree/Strongly Agree +	21 (22.1)	27 (17.4)	
Receiving a massage is often sexually arousing.	43 (45.3)	112 (72.3)	19.351
Disagree/Strongly Disagree -	39 (41.1)	36 (23.2)	**0.000**
Neutral =	13 (13.7)	7 (4.5)	
Agree/Strongly Agree +			
I would be comfortable receiving a massage from a woman.			
Disagree/Strongly Disagree -	16 (16.8)	6 (3.9)	28.294
Neutral =	29 (30.5)	20 (12.9)	**0.000**
Agree/Strongly Agree +	50 (52.6)	129 (83.2)	
I would be comfortable receiving a massage from a man.			
Disagree/Strongly Disagree +	28 (29.5)	94 (60.6)	31.442
Neutral =	33 (34.7)	45 (29.0)	**0.000**
Agree/Strongly Agree -	34 (35.8)	16 (10.3)	
I would prefer that my massage therapist be the same sex as I am.			
Disagree/Strongly Disagree +	33 (34.7)	9 (5.8)	85.813
Neutral =	44 (46.3)	25 (16.1)	**0.000**
Agree/Strongly Agree -	18 (18.9)	121 (78.1)	

that factor loads of both the original scale and the Turkish version were similar. The scale had a strong and valid construct validity for the sample, including the Turkish sample.

CFA results showed that fit indices and factor loading values were within limits suggested in the literature. According to studies, fit indices above 0.90, the RMSEA value of less than 0.08, and the x^2/df value of fewer than 5 confirm the factor structure of the measure [22,23]. The examination of the fit indices of the ATOM scale indicated that all fit indices were >0.90, RMSEA value was 0.063, and x^2/df was 1.988. The RMSEA value of the original version of the scale was 0.08. Since other fit indices were not analyzed, no comparison could be made [10]. According to CFA results, the data fit the model, they confirmed the two-factor structure, and there was a correlation between sub-dimensions and the scale. The EFA and CFA results in the current study showed that the scale was a valid tool, thereby supporting the construct validity of the scale in the general Turkish population.

4.2. Reliability

The time-dependent invariance of a scale is assessed using the test-retest method [24]. The interval between the two tests should not be so short so that participants will not remember their responses in the first application of the test. Therefore, there should be about two to three weeks interval between two tests. Paired sample t-test and Pearson correlation were used to investigate test-retest reliability [21,24,25]. The scale was re-applied to 30 participants three weeks after its first application to evaluate the test-retest reliability. There was no significant difference between the test-retest scores ($t = -0.665$, $p = 0.51$). A statistically significant, positive, and strong correlation was found between test-retest scores ($r = 0.83$, $p < 0.001$). A statistically significant, positive and strong relationship was found between test-retest mean scores in the original version of the ATOM scale ($r = 0.68$, $p < 0.001$) [10]. It was found that the ATOM scale was reliable in measuring the attitudes of the participants toward massage within three weeks.

Cronbach's α reliability coefficient is used to determine internal consistency for Likert-type scales. A Cronbach's α coefficient of between 0.60 and 0.80 shows the scale is quite reliable, and an alpha value ranging between 0.80 and 1.00 shows it is highly reliable [26,27]. Cronbach's α value calculated for the ATOM scale was 0.76, and it was 0.66 for massage as healthful and 0.69 for massage as pleasant sub-dimensions. These results showed that the ATOM scale had acceptable reliability for the Turkish sample. When the original results of the scale were examined, it was observed that the ATOM scale was highly reliable (total score: 0.85, massage as healthful: 0.71, massage as pleasant: 0.86) [10]. The items of the scale adapted to Turkish were equivalent to the original items and could measure similar qualities in a different culture in the same way.

Response bias impacts the reliability of a scale, and it is used to test if participants have answered the scale according to their own views or in line with the expectations of society or researchers. Hotelling T-square test was used to evaluate response bias [27,28]. The values of the Hotelling T-square test were 699.586, $p < 0.001$. The statistically significant test result showed that there was no response bias. The participants answered the questions according to their views and their answers were different from each other. As the original version of the scale did not include these data, no comparison could be made.

Item-total score analysis that is used for reliability shows the extent of correlation of the items on a scale with the scale or their sub-dimensions and each other. In addition, item-total score analysis measures the concept of whether it is to be measured. Item-total correlation coefficients should be positive and greater than 0.20 [22,27]. In this study, the correlations of the items with both the scale total score and the sub-dimension total scores were greater than 0.20. This finding showed that the items were correlated with both the scale and its sub-dimensions. Accordingly, the results obtained indicated that the items on the scale measured the properties of the scale to be evaluated and that the items were quite reliable. Since the results of the item-total score analysis of the original scale were not reported, they could not be compared [10].

4.3. Sexuality and gender

In the gender-related findings of this study, it was found that females preferred their massage therapist to be of the same gender and felt more comfortable while receiving a massage from women. In the original study findings, it was found that individuals preferred to receive a massage from women and that this preference was especially higher in men [10]. In a study in which the ATOM scale was used, participants of both sexes stated that they felt comfortable while receiving a massage from the opposite gender but that both men and women preferred to receive a massage from women if they were given the right to choose [13]. The fact that individuals generally prefer women for receiving a massage practice may be because women adopt more sensitive, nurturing, and caring roles than men. In the study, while both genders did not have concerns about being sexually aroused while receiving a massage, men thought that massage was a sexually stimulating practice. Similarly, Moyer and Rounds (2009) reported that men thought that massage was sexually arousing and that they were afraid of being aroused during a massage [10]. Regarding massage and gender in the literature, Reichert (2020) stated that neither the gender of the person giving a massage nor the gender of the person receiving the massage had any effect on the mental effect of the massage. On the other hand, it was observed that men who were given a massage by women had an increase in their elevated mood [29]. The intimacy of the practitioner and the receiver during a massage, the dressing condition of the receiver, the pleasant nature of massage application, and the social perceptions of massage can explain the reason for the sexualization of the application. More research is needed on attitudes towards sexuality, gender, and massage.

Given that this study brought a reliable and valid scale to the Turkish literature, and this is the first intercultural adaptation study, these are the main strengths and contributions of this study. Thus, this study provided an opportunity to make cross-cultural comparisons. This study also had some limitations. The utilization of the convenience sampling method was the first limitation. The second limitation was that more than fifty percent of the participants in our study were female. Since the attitudes of females toward massage may be different from those of males, there may be some limitations in using the scale when the attitudes of males towards massage are evaluated. For further studies, the numbers of gender groups can be selected equally. The lack of a valid and reliable study in different cultures other than the original version of the scale was the other limitation.

5. Conclusions

According to the results obtained in this study, the ATOM scale is a reliable and valid scale for identifying attitudes toward massage. Health professionals can use this scale to determine the attitude of the individual toward massage, and they can individualize the care to the patients to have the maximum benefit from the positive physical and psychological effects of massage. The authors suggest that studies can be conducted with different sample groups to evaluate the results of the scale by determining the factors affecting massage attitudes. In addition, cross-cultural comparative studies may be conducted using the scale in future research.

CRediT authorship contribution statement

Gizem Göktuna: Conceptualization, Writing original draft. **Gülşah Gürol Arslan:** Conceptualization, Writing review & editing. **Dilek Özden:** Writing review & editing.

Financial support

This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We thank the participants for their kind participation in this study.

Data availability

The data used and/or analyzed during the present study are available from the corresponding author on reasonable request.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.eujim.2022.102178.

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