Investigating the Factor Structure and Psychometric Properties of the Iranian Version of the Acceptance of Cosmetic Surgery Scale

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Abstract

Introduction: Plastic surgery and its acceptance have been increasing in recent years. People have different psychological problems. In recent years, studies have emerged on this group of people. However, there is no tool that can assess the acceptance of plastic surgery.
Objectives: The aim of this study is to determine the factor structure and psychometric properties of the Iranian version of the Acceptance of Cosmetic Surgery Scale (ACSS).
Materials and Methods: In this cross-sectional study, 226 students were selected through convenience sampling among students of Hormozgan University during the academic year 2014–2015. In order achieve the aims of this study, the Iranian version of the ACSS was completed. The data was analyzed using internal consistency, composite, Pearson's correlation coefficient, exploratory factor analysis, and confirmatory factor analysis.
Results: The reliability of the scale was obtained by calculating the internal consistency of Cronbach's alpha as 0.94 and using the spelling method as 0.81. The results of the exploratory factor analysis reveal that two factors, "intrapersonal" and "social attention and consider", in this scale explain 65.57% of the total variance of the test. The confirmatory factor analysis confirms the existence of these two factors. The correlation coefficients of the subscales with the whole test were 0.89 and 0.97.
Conclusion: The findings of this study suggest that the ACSS can be an appropriate tool for assessing the tendency of individuals to perform plastic surgery and can be used as a valid scale in Iran.
Keywords: **Plastic Surgery, Statistical Factor Analysis, Psychometrics**

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Introduction

Plastic surgery is not medically necessary, but it radically affects one's appearance [1]. It has been carried out to restore the shape and function of organs [2], but today it is used inappropriately and unnecessary surgeries are prevalent. Plastic surgery is costly for individuals and the society. In a study conducted in New York in 2011, plastic surgeries increased by 3% compared to 2009, and 51% of all Americans, regardless of their income, ask for this type of surgery. According to the statements of the American Society for Plastic Surgery (ASPS), 13.1 million surgical procedures were performed in 2010 [3]. This increase in plastic surgery procedures indicates an increase in volunteers. In terms of the ratio of the number of plastic surgeries to the population, Iran is in the first place in the world [4]. It is also unofficially stated that the Islamic Republic of Iran has the highest number of cosmetic rhinoplasty (CR) cases in the world, although it is difficult to obtain accurate statistics to substantiate this [5]. The rate of plastic surgery among young people is increasing [6]. In Iran most applicants for plastic surgery have university degrees and the number of applicants at the university level is also high [7]. Various factors can be considered as motivations for plastic surgery, such as hoping for more satisfaction with one's appearance, enhancing psychosocial functions [8], and media advertising [9]. The growing popularity of plastic nose surgery in Iran can be attributed to several independent factors. In Iranian society, the beauty and ability to attract others is considered worthwhile in women [5]. The belief that psychopathology is involved in volunteering for plastic surgery is common [10].

The results of studies on people having plastic surgeries are ambiguous. Studies based on the pre-operative interviews of patients having plastic surgeries show a high level of disorders in the first line, and also demonstrate two guidelines of Diagnostic and Statistical Manuals of mental disorders (DSM) among these patients. In contrast, studies using psychological tools report less psychological damage. Both studies report a variety of postoperative outcomes: relatively modest improvement in psychological symptoms or no change. Unfortunately, many methodological problems with both sets of studies create questions about the reliability of these results. However, further research is needed here [11]. Around 7% to 15% of those who apply for plastic surgery suffer from physical diformation [12].

The body image and self-esteem of women undergoing plastic surgery before and six months after surgery have significant differences [13]. A study investigated the relationship between personality disorder and body idiopathic symptoms in a group of 66 patients who applied for aesthetic surgery. The occurrence of a pathologic response is associated with the imagination of defects in appearance, necessitating follow-up surgery processes to resolve it; severe paranoid personality disorders and schizotypal personality have also been observed. Persons who applied for plastic surgery had lower scores in terms of appearance, body satisfaction, depression, and anxiety, and higher scores than the norms of society in terms of worries about physical deformity [15]. These individuals have more interpersonal sensitivity and obsessive–compulsive disorder [16]. One of the tools used in other countries for the examination of plastic surgery is the Acceptance of Cosmetic Surgery Scale (ACSS). This scale has three sub-scales: individual, community attention, and thought. The psychometric properties of this questionnaire have been obtained in Serbia [17], Brazil [18], Italy [19], Malaysia [20], and South Korea [21]. In both Brazil and Italy, three main sub-scales have been reported; in Malaysia and South Korea, two sub-scales of attention

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and thought as well as of the individual and society have been reported.

This questionnaire has also been used in various studies to assess the acceptance of cosmetic surgery with other variables. Among these can be mentioned a study in which the relationship between eating disorders and the attitude toward plastic surgery in female students in order to assess the attitude to plastic surgery and ACSS was used [22]. However, in most studies in Iran, self-developed scales relating to the study have been used in order to measure the acceptance of plastic surgery; no psychometric properties of a universal scale have been used to evaluate the acceptance of plastic surgery in either the applicant or the non-applicant group. Therefore, the aim of the present study is to determine the factor structure and psychometric properties of the Iranian version of the ACSS.

Materials and Methods
The first step of this cross-sectional study was used to compare translations and matching versions for Iranian society. In order to translate and obtain reliability, the Banville method [23] was used. At first, the ACSS was semantically translated by the researcher of the present paper and two students of the master's degree program in the English language department of the University of Shiraz independently. The three translations were turned into a single form after solving existing challenges. In order to determine whether the subjects received statements of different scale materials in accordance with the purpose and objectives of the test suppliers, and whether there are different impressions of a substance among the subjects, 20 students were asked to participate in a preliminary study. For this purpose, the subjects participated in an individual discussion after completing the scale individually: The first author spoke to them about the scale materials one after the other and asked about the meaning of each substance. Finally, some of the items

were rewritten. The translated version of the ACSS was given to one of the English professors, was translated into English, and compared with the original version to check if it had the same concept.

The statistical population of this study included all male and female students of Paramedical School, who studied in the school year of 2014–2015. The statistical population included 821 students. Given that the number of items in the questionnaire was 15 and considering the percentage of students dropping by more than 20% to 300 students who were randomly selected, tools were provided to 226 subjects, who completed these in full. Based on the guidance of the scale and the observance of ethical principles, including the lack of willingness to complete the questionnaire and the lack of mention of name, the subjects were asked to read the questions carefully and answer any questions based on how many items are correct about them and then give a score of 1 (very disagree) to 7 (very much agree).

The research tool was the ACSS. This scale was developed by Henderson-King and Henderson-King in 2005 [24]. It initially had 26 items, which were later reduced to 15 items. The scale is used to measure the attitude to plastic surgery and has three sub-scales: the intrapersonal sub-scale, the social sub-scale, and the consider sub-scale. The intrapersonal sub-scale measures the usefulness of self-directional attitudes toward plastic surgery. This sub-scale guides the belief that plastic surgery could have beneficial effects that, for example, it can help enhance self-esteem and satisfaction with the individual's appearance. Social sub-scale introduces the acceptance of plastic surgery as a tool for being more attractive in the opinion of others and obtaining social rewards. The consider sub-scale assesses the probability that the subject considers the application of plastic surgery and thinks about it. Social sub-scale allows direct evaluation of the probability of interest of subjects about the methods of

plastic surgery. The Likert scoring scale is from 1 to 7. A higher score indicates more acceptance of cosmetic surgery.

In order to investigate the reliability and validity of internal consistency, Pearson's correlation coefficient, and the construct validity of Iranian version of this scale, its functional structure was investigated using exploratory and confirmatory factor analysis using SPSS18 and LISREL software, and also through the calculation of internal correlations. The reliability of the scale was also evaluated by calculating the internal consistency and Cronbach's alpha coefficient. The LISERL software was used to verify the confirmatory factor analysis.

Results

The individual–social features of the research examples are shown in Table 1. Cronbach's alpha coefficient was used to measure the internal consistency of ACSS. Based on the results, the ACSS alpha coefficient for the whole sample is 0.94, which is significant and very satisfactory at P=0.001. Cronbach's alpha coefficients were 0.86 and 0.92 respectively for each sub-scale, including intrapersonal factors, social, and consider. In the determination of reliability by the split-half method, the coefficient of halving this scale was 0.81, which is a satisfactory coefficient.

Table 1: Frequency of the investigated students (n = 226)	
Indicator	**Number (%)**
Gender	
Male	64 (28.3)
Female	162(71.7)
Field of Study	
Radiology	23(10.2)
Nursing	71(31.4)
Medical records	7(3.1)
Surgery room	40(17.7)
Midwife	36(15.9)
Anesthetics	21(9.3)
Medical informatic	10(4.4)
Laboratory sciences	18(0.8)
Marital status	
Single	182(80.5)
Married	44(19.5)
Employment status	
Unemployed	201(88.9)
Employed	25(11.1)
Performing a plastic surgery	
Yes	7(3.1)
No	219(96.9)
Total score	226(100)
Age	Mean ±SD 21.42±4.53
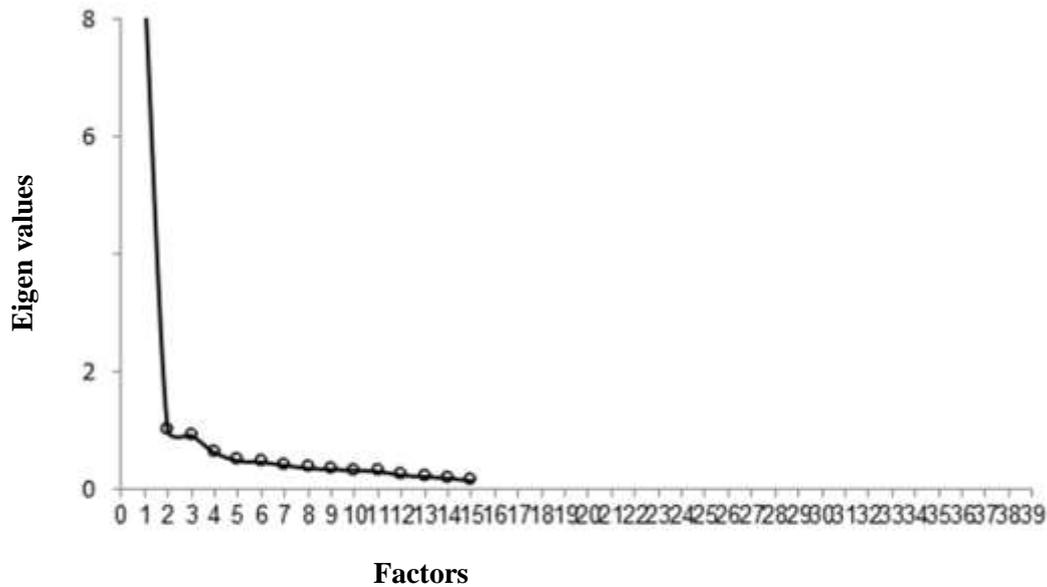
Figure 1: Chart of Eigen values for determination of the factors of the ACSS

Question	1	2
	Table 2: Items and factor burden of ACSS	
1	0.785	
2	0.826	
4	0.801	
5	0.748	
14	0.575	
3		0.680
6		0.629
7		0.535
8		0.727
9		0.737
10		0.682
11		0.744
12		0.761
13		0.780
15		0.682

Exploratory factor analysis, confirmatory factor analysis, and internal correlations (sub-scales' correlation with the total score of the test) were used to determine the structural validity. The main components analysis method was used to analyze the factors of the acceptance of cosmetic surgery. This method aims to explain all the variances of the set of considered variables. Varimax rotation is used for the final recognition of the factors that probably form the basis of this scale, as well as its simple structure.

Values obtained for the Kaiser–Meyer–Olkin (KMO) test (0.94) and the significance level of Bartlett's test of sphericity are also less than 0.05; therefore, the adequacy of the data for factor analysis has been set and the data of the present study are capable of being factors.

In general, according to the Figure 1 and the eigenvalue, the two-factor model

seems to be the most appropriate one. This model confirms previous findings that there are two factors on the scale of acceptance of plastic surgery [23, 24]. The special values for the first to third factors are 8.72 and 1.10 respectively. The values for the total variance for the first and second factors are 58.18% and 7.38% respectively. This explains 71.79% of the total variance of the test.

The results of this survey show that five of the items, including 14, 5, 4, 2, and 1 were placed on the first factor due to a similarity with the original scale. Moreover, "intrapersonal" was selected as the main scale, with questions such as "It seem reasonable if we have a little cosmetic surgery instead of having bad feelings about our appearance for years," "Cosmetic surgery is a good thing, because it makes people feel better about

themselves," and "If plastic surgery can cause a person to feel good about his/her appearance, then it should be tested." The remaining 10 items that is, 15, 13, 11, 12, 10, 9, 8, 7, 6, and 3 were placed on the second factor, including "People who have a lot of dissatisfaction because of their physical appearance, can consider cosmetic surgery as an option," "If I could do cosmetic surgery free of charge, I probably would have thought about it," "I sometimes think of having a cosmetic surgery," "I will never give up on cosmetic surgery," and "I will think about it if my surgery is good for my work." These were referred to as part of the "consider–social" factor. None of the items had a factor of less than 0.3, and were, therefore, not eliminated. Table 2 shows the factor burden of each of the factors after the varimax rotation.

Table 3: Final characteristics of factors of ACSS by the main component method

Factors	Factor	Eigen value	Explained variance percentage	Concentration percentage of explained variance	items
Interpersonal	1	8.72	58.18	58.18	1,2,4,5,14
Social attention and consider	2	1.10	7.38	65.57	3,6,7,8,9,10,11,12,13,15

Table 4: The mean and standard deviation of the total score and its sub-scales

Factor	Mean	SD
Interpersonal	19.91	7.32
Social-Attention and consider	34.74	14.77
Total score	54.65	20.93

Table 5. Correlation coefficients between ACSS factors with each other and with total scale

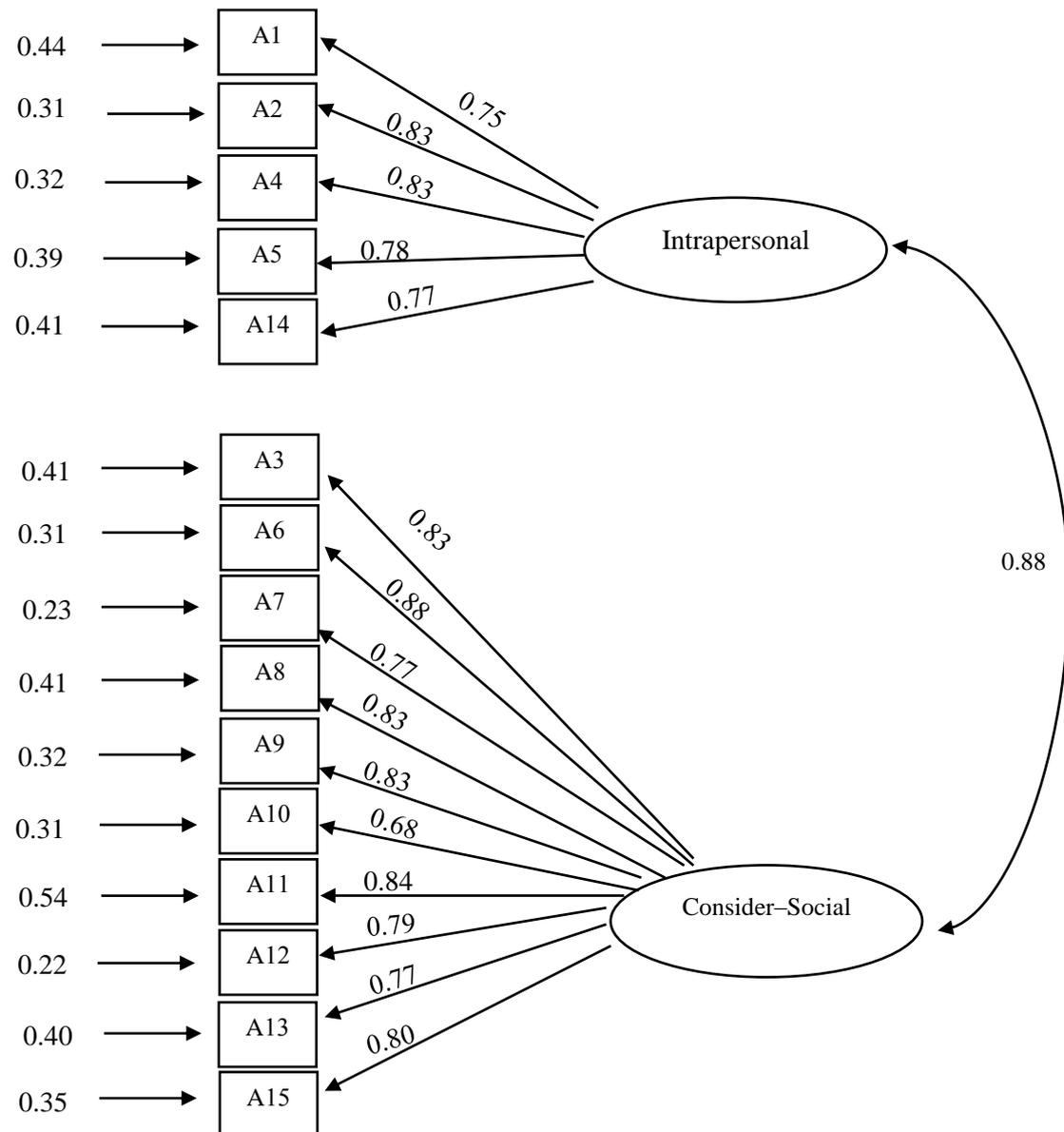| Factor	Interpersonal	Social–Attention Consider	ACSS
Interpersonal	1	0.769[*]	0.892[*]
Social – Attention and Consider	0.769[*]	1	0.975[*]
ACSS	0.892[*]	0.975[*]	1

*P=0.0001

Figure 2: Results of factor loaded and measurement errors of Confirmatory Factor Analysis of the ACSS

In table 3 confirmatory factor analysis based on the structural equation model was used to confirm the sub-scales of questionnaires for all participants of the research. The mean scores for the two sub-scales of the present study are shown in Table 4. In order to verify the univariate and multivariate normality of the data, Mardia's coefficient was calculated using the LISREL software. The results of the natural distribution of data showed p>0.05. Additionally, the results obtained from the confirmatory factor analysis using LISREL software and the determination of the index of fitness represent the confirmation of the two factors that structure this scale. The chi-square and Root Mean Square Error Approximation (RMSEA) indices are absolute compliance indices. Since the researcher anticipates compliance and not difference, the insignificant chi-square test

is desirable. In this test, the larger the sample size the greater is the test power. Therefore, in samples of more than 200 people, the pattern is weak if the chi-square is meaningful despite the slight difference in compliance. Given these considerations, a pattern in which the amount of chi-square is less is preferable.

In this study, the chi-square test was obtained as part of the two-factor structure (216.24) (p =0.0001, df=79). Another indicator that was introduced to eliminate this limitation of the chi-square statistics is that if it is smaller than three, then it is an indicator of pattern compliance [25]. In this study, the index value is 2.73, which indicates compliance of the two-factor model of this scale. Moreover, the values of the RMSEA, Good Fitness Index (GFI), and adequacy index (confirmatory factor index (CFI) were 0.088, 0.9, and 0.98 respectively. This indicates good compliance of the two-factor structure. The structural design of this scale, along with all the items, sub-scales, and total score, is presented in Figure 2.

Pearson's correlation coefficient between its sub-scales with each other and with the total scale was used to evaluate the correlation validity of each item with the total score of the ACSS. The results of this study showed that the scores of all sub-scales have a significant correlation with the total score at the level of p = 0.0001. Meanwhile, the factor "socialattention and consider" (factor 2) had the highest correlation with the total scale scores. Correlation coefficient between all factors was significant with each other and with total scale. The results of this analysis are presented in Table 5.

Discussion

This study was conducted to evaluate the psychometric properties and factor structure of Acceptance of Cosmetic Surgery Scale (ACSS) in the context of Iranian society. This scale is currently one of the most widely used cosmetic surgery acceptance scales used worldwide in various studies [26-32], and has shown that in different cultures, internal consistency, reliability and validity are appropriate [17-20].

The results of this study show that Cronbach's alpha score of total acceptance of cosmetic surgery scale is 0.94, the interpersonal sub-scales is 0.86, and social attention and consider is 0.92. These, like the reliability of previous studies, indicate the desirable reliability of this scale [16–20, 33]. In the present study, two factors were found in the exploratory and confirmatory factor analysis, which showed the main scale and then three sub-scales. Some previous studies are inconsistent with others. The main measures of the ACSS are three factors: the in-person subcategory, attention and thinking, and the sub-scale of society [24]. The Serbian version of this tool showed the three-factor model was the best model for the two and one factor model. This model has internal consistency, convergent validity, discriminant validity, and good nomological validity. The correlation of the sub-scales with each other was also significant: between 0.62 and 0.78; significant at the level of 0.01. This version is sufficiently reliable for use in Serbian samples [17].

Brazil's version of 311 adults reported all three factors as the main version. Cronbach's alpha was 0.86 for the total score, 0.82 for the in-person subcategory, 0.87 for the subscale of the society, and 0.91 for consideration and thought [18]. The reliability of the Italian version of the ACSS in 387 adult women also had three factors in the factor analysis, which had a strong relationship. Cronbach's alpha was a total score and all sub-scales were higher than 0.86 [19]. However, in studies of the alignment of this scale with some cultures, two factors have been reported. One of these studies is the Malay version of this scale. In the Malay version, the first factor was the sub-scale of attention and consider, and the second factor was a combination of the social and interpersonal

factors [20]. Similar to the Malay version, the South Korean version also showed two factors. Unlike the Malay version, the sub-scale of attention and consider differed from that of the original, as it included a number of items from the sub-scales of the social and the interpersonal. The overall score showed good consistency (0.95) [21]. The achievement of two sub-scales in the Iranian version and its similarity to the two Malay and South Korean versions shows that there are probably similar Asian cultures among these three countries.

According to the results, the present study shows that both internal and external factors (including social, attention and consider) affect the perception of beauty in individuals in Iran. Also, this scale is a good measure for the Iranian population for preventive and therapeutic interventions. But because of the high correlation between the two factors, as in the previous studies, it is suggested that for the Iranian population it is better to use the total score to gauge the tendency toward cosmetic surgery.

One of the limitations of the present study is the lack of uniformity of the sample for both genders as well as the variation of the sample. It is suggested that more variables and more examples be used for future research, and also other variables such as education level and socio-economic status be considered. It is also recommended that other types of reliability and validity (including content validity and criterion validity) be considered in future research by researchers.

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Conflict of interest

No conflict of interest has been declared by the authors.

Author contributions

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE
(http://www.icmje.org/recommendations/):

-Substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
-Drafting the article or revising it critically for important intellectual content

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