

## Development and Validation of a Scale for Measuring Family Happiness

Kenan Tastan<sup>1</sup>, Pinar Fakirullah<sup>2</sup>, Cüneyt Ardic<sup>3</sup>

From, <sup>1</sup>Assistant Professor, <sup>2</sup>Assistant, Department of Family Medicine Ataturk University, School of Medicine, Erzurum, Turkey, <sup>3</sup>Assistant Professor, Department of Family Medicine, Recep Tayyip Erdogan University School of Medicine, Rize, Turkey.

**Correspondence to:** Dr. Kenan Tastan, Assistant Professor, Ataturk University, Tip Fakültesi, Aile Hekimliği AD, 25240, Erzurum, Turkey, E Mail: ktastan2002@yahoo.com

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### ABSTRACT

**Objective:** We aimed to develop a subjective family happiness scale and analyzed its validation and reliability. **Methods:** To develop, a scale for measuring subjective family happiness, an item pool was created. A 19-item scale was formed using Delphi rounds and seeking expert opinions. The instrument was applied to 300 participants >18 years of age. Six items were excluded according to participant opinions (n=2) or due to low factor loads (n=4). **Results:** Kaiser-Meyer-Olkin coefficient was found as 0.93, and the Cronbach Alpha internal reliability coefficient was calculated as 0.93. The exploratory factor analysis confirmed that the scale had a two-dimension structure and these dimensions were named as 'happiness' and 'unhappiness'. **Conclusion:** The scale was valid and reliable for the measurement of subjective family happiness in family members of >18 years. This instrument can be utilized by family physicians, family counsellors, family therapists, psychiatrists, and psychologists in making decisions about the problems related to the families.

**Key words:** Family Relationships, Happiness, Psychometrics, Reliability and Validity.

The family is the cornerstone and the smallest unit of the society. The fulfillment of care needs of the individual after birth and satisfaction of his physiological and psychological needs of health and happiness, require maintenance of the family. The formation of social and individual values contribute to the significance of family in the community [1,2]. Although the happiness concept was investigated for ages, it still has unexplained aspects. However, it is obvious that the family has substantial effects on the human health [3]. Despite its importance, happiness is an ambiguous concept challenging to measure.

Many scales related to family, like the family assessment scale [4], family sense of belonging scale [5] and parents' attitude scale [6] had been developed. Although these scales are related to family happiness, they

deal with the family happiness from limited aspects and do not have an integrated evaluation. Therefore, there is a need for a scale that has an integrated approach to family happiness. To our knowledge, there is no scale developed for the measurement of family happiness. In the present study, we aimed to develop the "subjective family happiness scale" (SFHS).

### MATERIALS & METHODS

We have designed a scale for development, validity, and reliability. For the item development, an expert panel consisting of 10 specialists (family counseling experts, psychologists, psychiatrists, and social service experts), was formed. Face-to-face or phone interview was done with the panelists with additional communication via e-mails. An item pool was generated consisting of questions

that can define family happiness and it was revised and enlarged by the authors evaluating the previously developed scales [7,8]. The first item pool consisted of 225 items where, items that were thought not to be ultimately defining the family happiness, and the items similar to others, were eliminated during a second Delphi round. Questions, thought to be related to the objective family happiness, rather than the subjective family happiness, were also removed. The final draft application form consisted of 19 items (6 positives and 13 negatives). The 18th and the 19th items were to be answered only by the married participants.

The scale was designed in a five-point Likert-type (5: Strongly Agree, 4: Agree, 3: Not sure, 2: Disagree, 1: Strongly Disagree) and it also included negative items which were scored accordingly [9]. The draft application scale was administered to a voluntary sample of 30 adults. They requested to evaluate the items regarding comprehensibility, grammar, and spelling; depending on the responses, some items were reorganized. The last version of the SFHS was administered to 390 participants.

The sample consisted of concomitant outpatients from the clinics of the Department of Family Practice at a medical facility during June 2016. Ethical approval of the study was obtained from the ethics committee. The inclusion criteria were as follows: individuals who were older than 18 years, living with the family, absence of any diagnosed psychiatric disease, lack of any systemic disorder, and absence of any mental or physical handicap.

Along with the scale, a questionnaire consisting of six questions was applied to collect data about the demographic features. Questionnaires with missing or erroneous answers were not evaluated, leading to 300 valid responses. Following the first analysis, two additional items were removed due to providing incongruent data. The mean and standard deviation of the item scores, and the item-scale correlations were calculated for the remaining items. Exploratory factor analysis was conducted to examine the factor structures and the sub-dimensions in which the items that had factor loads of lower than 0.6, were excluded. Two factors that appeared after factor analysis, which were named by the consensus of the experts as 'happiness' and 'unhappiness' dimensions. Data were analyzed using SPSS 20.0 statistical software (SPSS Inc., Chicago, Illinois, United States). Data was presented as frequency (percentage) for

categorical variables and mean ( $\pm$  standard deviation) for numeric values. Normality of the numeric variables was evaluated by the Shapiro-Wilk test. For validation analysis, the suitability of the data for factor analysis was evaluated by the Kaiser-Meyer-Olkin coefficient and Bartlett's Sphericity test. Exploratory factor analysis was used to test the construct validity of the scale. The Cronbach alpha analysis was used to calculate the internal consistency coefficient.  $p < 0.05$  was accepted as statistically significant.

## RESULTS

Mean ( $\pm$ SD) age of the participants was  $32.3 \pm 10.1$  years (range 18-63). Other demographic features of the participants are given in (Table 1).

**Table 1: Demographic features of the participants (n=300).**

Age (mean $\pm$ SD)	32.3 $\pm$ 10.1 (range 18-63 y)	
Monthly income (TRY)	3893.42 $\pm$ 6235.59	
	<b>n</b>	<b>%</b>
<b>Gender</b>		
Female	156	52
Male	142	47.3
Non responders	2	0.7
<b>Educational status</b>		
Primary school	19	6.3
Secondary school	24	8
High school	95	31.7
University & higher degrees	162	54
<b>Marital status</b>		
Single	124	41.3
Married	167	55.7
Divorced	3	1
Widow	5	1.7
Living apart from their spouse	1	0.3
<b>Position in the family</b>		
Mother	62	20.7
Father	89	29.7
Child	117	39
Spouse (In case of childlessness)	23	7.7
Other	6	2
Non responders	3	1

Validity analysis- The Kaiser-Meyer-Olkin coefficient was found as 0.93, and the Bartlett Sphericity showed the significance level as  $p < 0.05$ .

**Table 2: The form of subjective family happiness scale**

<i>Please make an evaluation about the following statements in terms of your emotions during the last two weeks. Please make your evaluations by taking your family; you are living with now, into consideration. Do not take care of numbers.</i>	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
If I had a chance to select my family, I would select my family that I have now.	1	2	3	4	5
I have a contribution to my families' happiness.	1	2	3	4	5
I feel myself valuable in my family.	1	2	3	4	5
My family increases my life energy.	1	2	3	4	5
When I compare happiness of my family to the happiness of the families around me, I think that my family is happier.	1	2	3	4	5
Some families, either what happens, are very happy in all conditions. I think my family is also like this.	1	2	3	4	5
Some families do not seem happy even they have the opportunities that are thought to be necessary for happiness. My family has the opportunities that are thought to be necessary for happiness.	1	2	3	4	5
I feel happy when I spent time with my family.	1	2	3	4	5
I with my family can overcome all kinds of problems.	1	2	3	4	5
I cannot get along with my family.	5	4	3	2	1
I feel unhappy when I am together with my family.	5	4	3	2	1
I generally feel the time I spent with my family, monotone and boring.	5	4	3	2	1
My family is unhappier than the most of the other families that I know.	5	4	3	2	1

After factor analysis, items 18 and 19 were excluded followed by which, exploratory factor analysis was done, which revealed that the factor loads of three items in the first factor were below 60. Thus, these three items were also excluded and the analysis was repeated. The results of the second analysis revealed that the first factor load values for all items were  $\geq 60$  nevertheless; a factor load value that was similar to the first factor load values of three items appeared for a second factor, which showed that these items were significantly related to both the factors. Another item, showing no relationship to both factors, was also excluded. Thus, four items (items 8, 10, 13, 14) were excluded after factor analysis, and a scale of 13-items with two factors was formed (Table 2).

The exploratory factor analysis was repeated and after the third analysis, one item that was grouped to the second dimension was switched to the first dimension, and had a factor load of 64. After exclusion of the four items, the total variance explained, increased from 67.6% to 70.2% (Table 3). The 13 items collected, fewer than two factors after factor analysis, are shown in Table 4. It is obvious that the first factor is stronger than the second factor in terms of both the item numbers and factor loads. Of the totally explained variance, 56.1% belongs to the first factor, and the remaining 14.0% to the second factor.

The items were evaluated with expert opinions. The first factor was named as "happiness" and the second factor as "unhappiness". Finally, the SFHS consisted of 13 items; of which, nine were positive (items 1-9) and four were negative (items 10-13) (Table 2). Higher scores indicate a higher degree of subjective family happiness. The lowest score that can be collected from the scale is 13, and the highest score can be 65. Mean and standard deviations of scores of each item are given in table 5.

**Table 3: The variance that one item explains and the item total correlations**

Items	Total	Variance that one item explains	Item total correlation
Item 1	7.304	56.184	0.795
Item 2	1.830	14.079	0.629
Item 3	0.662	5.094	0.793
Item 4	0.593	4.565	0.865
Item 5	0.463	3.558	0.810
Item 6	0.383	2.950	0.675
Item 7	0.351	2.700	0.706
Item 8	0.296	2.275	0.825
Item 9	0.291	2.238	0.752
Item 10	0.250	1.926	0.564
Item 11	0.232	1.782	0.618
Item 12	0.203	1.565	0.493
Item 13	0.141	1.084	0.454

**Table 4: Factor matrix**

Items	Total	Factor	
		1	2
Item 1		0.842	
Item 2		0.699	
Item 3		0.841	
Item 4		0.902	
Item 5		0.853	
Item 6		0.739	
Item 7		0.769	
Item 8		0.868	
Item 9		0.805	
Item 10		0.611	
Item 11		0.648	
Item 12			0.663
Item 13			0.679
Variance (%)	70.2	56.18	14.07

Reliability Analysis- The Cronbach  $\alpha$  internal consistency coefficient of the scale was calculated as 0.93. Distinctiveness and item-total correlations (that were calculated for item reliability) are given in table 3. The calculated correlations differ between 0.45 and 0.86, and all are statistically significant ( $p < 0.05$ ).

**Table 5: Mean and standard deviations of item points**

Item	Mean	Standard deviation
Item 1	3.98	1.367
Item 2	4.00	1.208
Item 3	3.97	1.268
Item 4	3.97	1.285
Item 5	3.71	1.304
Item 6	3.54	1.285
Item 7	3.70	1.247
Item 8	3.99	1.252
Item 9	3.79	1.216
Item 10	3.86	1.279
Item 11	4.14	1.078
Item 12	4.06	1.106
Item 13	4.12	1.121

## DISCUSSION

In this retrospective study, we intended to explore the role of preoperative CEA and CA19-9 levels and their association with clinicopathologic features. According to our results, we have two main findings. First, the patients with higher levels of CEA and CA19-9 levels had higher

grades of gastric cancer. Second, CEA and CA19-9 level were not associated with the mean survival. The clinical significance of CEA and CA19-9 in gastric cancer has been studied previously also.

Shimada et al [12] evaluated the clinical significance of serum tumor markers (CEA, CA19-9, and CA72-4) in gastric cancer patients in their review. They have conducted a systematic literature search and included a total of 187 publications. According to their results, positivity rates of the CEA and CA19-9 were 21.1% and 27.8%, respectively. On the contrary to this study, some studies have also reported different rates of positivity of CEA and CA19-9 [1,8]. Moreover, they highlighted that TMs were associated with the stage of the tumor and survival. Since the positivity rates were small, the use of these TMs for The family concept is a social reality of the past as well as our current generations. Putting the family to the keystone of the society, happy family means happy generations and happy societies. One of the main teachings of the family medicine discipline is the “biopsychosocial approach”. Biopsychosocial approach deals with the individual together with his family and environment, and it evaluates the well-being of the individual physically, spiritually and socially. Hence, in this context family happiness is very important for family physicians and for individuals giving family counseling. As there is no scale to measure the subjective family happiness in the literature, the SFHS can fill the gap in this field.

The exploratory factor analysis revealed that the items of the SFHS could explain 70.26% of the total variance. A greater item variance indicates that the item has higher discrimination ability between the samples that have and have not the feature that is aimed to be measured by this item. Vice versa is also the case [10]. If one wants to discriminate the participants in terms of a distinct feature by a scale, the scale should be formed by items that have high item variances (namely item difficulty index should be close to 0.5) [10,11]. For one-factor scales, an explained variance of  $\geq 0.3$  is enough. Nevertheless, it should be higher for multi-factorial scales [10,12]. As the SFHS has two factors, it is obvious that the explained variance is high enough.

The last point for the psychometric scales is the construct validity. The items were evaluated under the increment of the factor that the item reached to the maximum weight. There is no statistically determined

value, which an item should reach to be included under the content of a factor. There are some concepts that test the validity of the scales. Content validity is one of them. Content validity indicates that globally the scale and the each item of the scale measures the attitude that was aimed to be measured [10,13]. The items forming the scale should include all measurable features of the attitude that is aimed to be measured. Mostly the expert views and the present literature are used to assure the content validity [14]. For the present scale, the items were constructed by experts, they were reevaluated on repeated sessions, and some previously reported scales were used to achieve content validity [7,8]. As there is no previously developed scale for measurement of subjective family happiness, we could not perform a comparison.

The Cronbach  $\alpha$  coefficient of the scale was high. Although test-retest analysis is another method for analysis of reliability, [9,10], for scales that aim to measure the intangible concepts, like happiness, it is very difficult to obtain same results in repeated measurements [10,15]. In Likert-type scales, each item should have a consistent and compatible association with the attitude that is aimed to measure. In another words, each item should measure the same attitude. Because of these reasons, we did not perform a test-retest analysis.

## CONCLUSION

We have developed a subjective family happiness scale (SFHS) and found it a valid and reliable scale for measurement of subjective family happiness in family members of >18 years. It will be useful in making decisions about the problems related to the families by family physicians, family counselors, family therapists, psychiatrists and psychologists. Comparison of the results of the SFHS with those of new ones will augment the psychometric features of the present scale.

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