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Construction and Validation of Family Problem Solving Scale

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Abstract: The aim of the present research was to indices and characteristics of scale validation for family problem solving scale. The sample size of 55 couples (110 people) were selected among married men and women in Tehran and assigned to adjusted/compatible and maladjusted/incompatible groups. ENRICH marital satisfaction scale and the new FPS scale was used as research tools. Analysis of the aspects revealed 2 aspects out of 30: communication and problem solving. Studying internal correlation of total scores of the scales and subscales showed the association rate between total score and the aspects of communication and problem solving was 0.95. Reliability index of total score re-test was 0.91 and that of communication and problem solving was 0.78 and 2.89, respectively. Internal correlation of total score, communication and problem solving was 0.91, 0.78 and 0.83, respectively. As this scale is significantly associated with ENRICH marital satisfaction scale, is permanent and can distinguish adjusted/compatible and maladjusted/incompatible couples, it can be applied for clinical and research purposes.

Key words: Family problem solving scale, validation, family evaluation

INTRODUCTION

The key to prospering family performance is the family's knowledge to solve their problems. Almost all families have difficulties to deal with. However, study points that capable families solve problems as they develop; whereas, families that avoid problem-solving have more difficulties Problem-solving is the family's ability to resolve problems in order to maintain effective family functioning (Epstein *et al*., 1993). Family some problems involve everyday decisions these are called instrumental problems.

The others may be concerned with a family member's emotions and are affective in nature. Problem-solving goals can include either problem-focused goals, emotion-focused goals, or both, depending on the nature of the problem and how it is appraised (D'Zurilla and Nezu, 1999). Thus, it is conceptualized as a general coping approach that can help people manage or adapt to any stressful situation, even when they cannot positively be changed. Therefore, this increases their flexibility and perceived control and minimizes emotional distress (D'Zurilla and Nezu, 1999). Family Problem Solving (FPS) is an interventional method which is based on behaviorism. Harper (1975) has applied this method in a more direct way in rational and emotional treatment of direct decision therapy. Studies show that families can change inefficient methods to efficient ones through educational and therapeutic interventions (Gurman and Kniskern, 1981; Sheman *et al*., 1991; Kieren and Poirier, 1994; Dianne and Thomas, 1996).

The process of solving the problem is more important than the result; the problem-solving techniques are most powerful when combined to activate both the logical/rational and intuitive/creative parts of the brain (Wonder and Donovan, 1984). FPS is important in several ways first of all it facilitates effective interaction between husband and wife. Secondly, even if couples' relationship is improving because of the treatment, negative interaction occurs especially at problematic situations, but FPS can prevent this. Thirdly, there is a great difference between helpless and non-helpless couples in their solving problems. Helpless couples do not have necessary skills to solve their problems peacefully and need training, Using FPS, which is potentially preventive, couples become their own therapists. Problem solving skills that couples learn can be applied for several problems that are inevitable between couples. This model has two stages: Increasing communicative skills and Problem solving (Champion and Power, 2000). FPS is like a spectrum that covers all people at different levels. At one and there are people who are totally controlled by

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environment and at the other end, there are rational people. Problem solving is a process in which the gap between a present situation and a desired goal will be resolved. In general, the situation is one not previously met, or where a particular solution from past experiences is not known whereas, decision making is a process in which one or more possible answers is selected in order to reach a wanted goal. The steps in both problem solving and decision making are quite similar. Most models of problem solving and decision making include at least four phases (Bransford and Stein, 1984; Deway, 1933; Polya, 1971): (1) an Input phase in which a problem is known and an attempt begins to understand the problem, (2) a Processing phase in which alternatives are generated and evaluated and a solution is selected, (3) an Output phase which includes planning for and implementing the solution and (4) a Review phase in which the solution is evaluated and modifications are made, if necessary. Researchers describe the problem-solving/decision-making process as beginning with the perception of a gap and ending with the implementation and evaluation of a solution to fill that gap. Researchers have investigated the relationship of Jung's theory of individuals' preferences and their approach to problem solving and decision making (Lawrence, 1982; McCaulley, 1987; Myers and McCaulley, 1985). When solving problems, individuals preferring introversion will want to take time to think and clarify their ideas before they begin talking, while those preferring extraversion will want to talk through their ideas in order to clarify them. In addition, is will more likely be concerned with their own understanding of important concepts and ideas. Sensing individuals will be more likely to pay attention to facts, details and reality. They will also tend to select standard solutions that have worked in the past. Persons with intuition preferences, on the other hand, will more likely attend to the meaningfulness of the facts, the relationships among the facts and the possibilities of future events that can be imagined from these facts. They will exhibit a tendency to develop new, original solutions rather than to use what has worked previously. Individuals with a thinking preference will tend to use logic and analysis during problem solving. They are also likely to value objectivity and to be impersonal in drawing conclusions. They will want solutions to make sense in terms of the facts, models and/or principles under consideration. By contrast, individuals with a feeling preference are more likely to consider values and feelings in the problem-solving process. They will tend to be subjective in their decision making and to consider how their decisions could affect other people. In many studies about family problem solving, some tools have been used to assess problem solving skills, for instance, Jackman-Cram *et al.* (2006) studied problem solving behaviors to reduce depression and marital anxiety. It was proved that increasing anxiety or depression of the spouse reduces their problem solving capabilities, other studies have suggested that elevated stress levels can actually improve some aspects of cognition, particularly working memory, said Jessa Alexander, a study co-author and a research assistant in neurology at Ohio State. The results of the two problem-solving tests we administered suggested a decline in problem solving abilities that required flexible thinking. On the other hand, family problem skills decrease anxiety and stress in families. Wade *et al.* (2004) applied FPS for families whose children had brain damage. Blechman and McEnroe (1985) used fabricated predicaments instead of a valid scale or questionnaire to study efficiency of problem solving. Meanwhile, efforts have been made to construct and validate scales for family problem solving, which are in several fields: the first field is scales that focus on special aspects of problem solving. A good example is the studies by Hill-Briggs *et al.* (2007) which found scales for diabetes II (DPSS). This scale has 30 items focusing on diabetes control by the patient. The second field is the efforts to compile general scale for problem solving (PSS). This scale has 15 items which focus on self-control, aspects and process of problem solving. This scale is the most common scale to assess problem solving skills (Moorey *et al.*, 2000). The third field, which is dealt with in this article, is constructing a scale for family problem solving. Not much has been done in this regard. For example, we can mention Baugh *et al.* (1990), who made a questionnaire with 15 questions, to assess problem solving. Families who fail to stay problem-focused and instead resort to the exchange of negatively charged emotions during family problem-solving discussions tend to have more distressed adolescents and also fail to solve their disputes (Deborah *et al.*, 1994). The current study evaluates Construction and Validation of Family Problem Solving Scale (FPSS).

MATERIALS AND METHODS

Sample: The subjects totally were 340 people (170 couples); include Sample size for primary validation was 30 people (15 couples), for normal sample was 200 people (100 couples) and for assessing reliability was 110 people (55 couples). Samples were married man and women living in Tehran (Iran) on 2007.

Questionnaire: Family Problem Solving Scale (FPSS) and ENERICH marital satisfaction scale were the applied tools. The primary questionnaire for family problem solving scale was compiled using studies by Forgatch (1989), Dianne and Thomas (1996), Champion and Power (2000), D' Zirulla and Nezu (1990), Berger and Hannah (1999), Hill Briggs *et al.* (2007), Moorey *et al.* (2000) and Baugh *et al.* (1990). The questionnaire consisted of the ways to face existing problems, knowledge of the process and steps to solve the problem and the way to apply problem solving methods for couples. The questionnaire was validated after being content-validation by specialists. This scale had 36 items at first, which matches the system table made by the researchers. Then the questionnaire was given to 10 specialists and 30 people for evaluation and reliability assessment. After the assessment, questions were reduced to 30, which is the scale presented here. The questions are answered based on a 5 degree including: Never = 1, Seldom = 2, Sometimes = 3, Usually = 4 and Always = 5, some questions are scored the other way around including questions 9, 10, 12, 17, 18, 21, 25, 26 and 30. Scoring for these questions is like this: Never = 5. Seldom = 4, sometimes = 3, usually = 2 and always = 1. The higher scores show the ability of the couple to effectively solve their problems while the lower scores show the couples are not able to solve their problems.

ENRICH Marital Satisfaction Questionnaires were used. ENRICH main test copy includes 115 questions. This form first used for the description of dynamism of marriage and then used as an equipment for diagnose of couples who were seeking for marriage counseling. The questionnaire validity index in the clinical affairs was between 0.85 and 0.95 (Olson and Olson, 1997; Fowers and Olson, 1993). This questionnaire includes subscale such as: personality issues, marital communication, conflict resolution, financial problems, leisure activities, sexual relationship, parental, family and friends and religiosity. First, This questionnaire used for the description of dynamism on the marriage and later used as a tool for the diagnosis of couples seeking marriage counseling (Fowers and Olson, 1989). A 15 item form was developed by Olson and Olson (1997). The 47 item form was developed by Fowers and Olson (1993) and finally a 25 item form was developed by Wadsby (1998). In this research, The 47 item form was used.

Procedure: The main purpose of this correlation study was to indices and characteristics of scale validation for FPSS. The first group consisted of incompatible/maladjusted couples who sought advice at the family consultation center and got a low score for ENERCH marital Satisfaction scale. The second group was the usual couples who were cluster-randomly selected from 3 neighborhoods in south, north and center of Tehran, who were categorized into adjusted/compatible and maladjusted/incompatible groups after several assessments. The first group was 54 and the second group was 80 people, out of whom maladjusted/incompatible couples were excluded. Therefore, 56 people were selected for statistical analysis.

RESULTS

Out of 110 studied cases, 54 people were the ones who referred to family consultation center because of marital maladjustment and the other 56 people did not have marital maladjustment. In other words, 27 incompatible/maladjusted couples and 28 adjusted/compatible ones enrolled in the study. Their mean age was 34.5 years and mean age of their marriage was 16.5 years. More than eighty percent of them had high school diploma or a higher degree and the average number of their children was 2.6 (Table 1).

Face validity of the FPSS with 36 items was found using adaptive method and specialists' assessment. In the first step, questionnaire items were matched with the concepts in the two-dimensional table.

Then, the questionnaire was given to 30 people to fill it out so that the problem they had with understanding the concepts were removed. After compiling and analyzing their opinions, 6 items were deleted and the scale was validated with 30 items.

To determine the factor system of FPSS, involved parameters were studied using analysis of the main factors. At first, Eigenvalues of all 36 items and factor loading of each question were calculated. Then questions with factor loading less than 0.45 were excluded and the remaining questions were rotated using Oblique rotation. Factor analysis revealed 2 factors among 30 items, which had a KMO17 index of 0.83 and a Bartlett test was meaningful ($p<0.01$).

Analyzing the above mentioned factors shows that 13 items are over factor 1 and 17 items are over factor 2. The first factor is communication and has 13 items. This factor shows the way of communication and the interaction the couple need to effectively solve the problem. Eigenvalue of this factor is 5.09 and determines 39.2% of the variance. Factor 2 is problem solving skills and has 17 items. This factor measures the way and process of solving the problem based on a 5 step model. Eigenvalue of this factor is 5.46 and determines 32.2% of the variance (Table 2).

Table 1: Demographic data of the studied population

	Indexes			
Variables	Minimum	Maximum	Mean	SD
Age (year)	20	48	34.49	5.60
Duration of marriage (year)	2	25	16.50	5.49
No. of children	0	5	2.59	1.10

	Indexes		
Variables	Under high school diploma	High school diploma	Above high school diploma
Education			
Frequency	21.0	30.0	59.0
Percentage	19.1	27.3	53.6

Table 2: Factors of family problem solving scale and factor loading of each item

New	Questionnaire items	Factor 1 communication	Factor 2 problem solving
1	We have devoted a definite time for communication.	0.62	
2	I can easily talk my mind with my spouse.	0.68	
3	When we have a problem, we look for its solution.	0.76	
4	When we have a problem, we speak softly.	0.64	
5	Our rows are over past issues.	0.59	
6	We have determined a special place for communication	0.52	
7	I can easily express my feelings for my spouse	0.73	
8	We spend some time to cooperate and plan our life	0.67	
9	Our conflict ends in row and arguments	0.68	
10	Talking with my spouse turns to tension and fight.	0.71	
11	When we have a conflict, we try to solve it before it ends in a fight.	0.63	
12	We decide to solve the problem when the fight has started.	0.57	
13	While talking to each other, we give enough time to each other to express.	0.55	
14	When we have a problem, firstly we evaluate the problem and then figure out solutions.		0.76
15	When we have a problem, we determine the approximate time to solve it.		0.49
16	When a solution fails, we study its reason.		0.69
17	When we have a problem, we leave it unsolved.		0.63
18	When a solution does not work, our rows heat up.		0.63
19	Each time, we work on one subject.		0.45
20	We usually find several solutions for a problem.		0.67
21	When we are working on a problem, other problems are raised.		0.48
22	When we have a problem, we try to increase our knowledge about it.		0.63
23	We usually try to choose the best solution.		0.77
24	When we have a problem, we are sure it can be solved.		0.72
25	When my first efforts to solve the problem fail, I get disappointed.		0.47
26	When we have a problem, we do not look for a rational solution.		0.48
27	When I decide to solve a problem, I do my best.		0.72
28	When a decision is made to solve a problem, I commit myself to implementing it.		0.72
29	I believe I should analyze a problem if I plan to solve it.		0.68
30	Usually, our problems are bigger than what we can solve		0.55

Table 3: Internal correlation of scores of scales and subscales

Factors	FPSS	Factor 1
FPSS		
Factor 1	0.95	
Factor 2	0.95	0.81

Table 4: Reliability indexes for FPSS

Reliability factors	Internal correlation index	Re-test index	Discrimination index
FPSS	0.91	0.74	0.91
Factor 1	0.87	0.71	0.87
Factor 2	0.83	0.79	0.83

Studying internal correlation of the total score of the scale and subscales showed an association of 0.95 with communication and an association of 0.81 with problem solving, which has high validity. All indexes were significant at $p<0.01$ (Table 3).

To determine test-retest reliability of the scale, the questionnaire was given to the subjects after 30 days. The re-test reliability index was 0.91, 0.78 and 0.89 for the scale, communication and problem solving, respectively. To assess internal reliability of the scale, Cronbach's alpha was used, which showed internal consistency of 0.91, 0.78 and 0.83 with the scale, communication and problem solving, respectively. Furthermore, scale discrimination index was determined by using correlation test to measure marital satisfaction rate (ENRICH marital satisfaction scale), which was 0.91, 0.78 and 0.83 for the scale, communication and problem solving, respectively (Table 4).

Demographic factors were considered for their effect on the scale, which showed none of the scores of the

Table 5a: Comparison of scale scores and subscales among different age

	Mean			SD				
Index age scale	<29	30-39	>40	<29	30-39	740	F	p
FPSS	110.4	110.3	107.5	22.4	19.3	16.5	0.14	0.87
Factor 1	47.8	47.6	46.0	11.2	8.7	7.1	0.24	0.79
Factor 2	62.6	62.6	61.5	12.1	11.3	10.0	0.07	0.93

Table 5b: Comparison of scale scores and subscales among education groups

Indexes factors	Education	Mean	SD	df	t	p
FPSS	Under high school diploma	104.8	17.1	106	1.14	0.26
	> High school diploma	100.8	19.7			
Factor 1	< High school diploma	44.2	9.4	106	0.78	0.44
	> High school diploma	42.7	9.6			
Factor 2	< High school diploma	60.7	8.9	106	1.37	0.17
	> High school diploma	58.0	10.7			

Table 6: Comparison of total score of the scale and subscales between the two groups

Factors		Mean	SD	df	t	p
Total score of scale	Maladjusted	103.0	18.3	106	-3.46	0.00001
	Adjusted	110.0	19.3			
Communication	Maladjusted	43.5	9.4	106	-4.16	0.00001
	Adjusted	47.5	8.9			
Problem solving	Maladjusted	59.5	9.8	106	-2.85	0.00500
	Adjusted	62.6	11.2			

scale, factor 1 and factor 2 is influenced by subjects' education and age. The results were obtained using one-way variance. The results showed the total score of the scale, factor 1 and 2 did not have significant differences ($p<0.05$) (Table 5a, b).

T-test for independent groups was done to assess reliability of the scale between the adjusted/compatible and maladjusted/incompatible group. Results show total scores of the scale and subscales of communication and problem solving are significantly different between the two groups ($p<0.01$). In all cases, the score of problem solving is significantly more in the adjusted/compatible group than in the maladjusted/incompatible one (Table 6).

DISCUSSION

Since interventional methods are increasingly applied for Family Problem Solving, it is necessary to construct and validate scales. There are different approaches toward family problem solving; some researches indicate that definitions of effective family problem solving that are based on directly observed measures of group interaction are more valid than definitions that rely primarily on family characteristics (Blechman and MacEnroe, 1985) problem-solving component in the cognitive-behavioral approach with couples and how the focus places particular emphasis on the restructuring of thought and perception. It is this problem-solving component that may be considered to be one of the pivotal factors that bind a couple together and facilitate future progress in the relationship (Dattilio *et al*., 2006). This article introduces the indices and characteristics of scale validation for family problem solving. FPSS, which is significantly associated with ENRICH marital satisfaction scale, is consistent in time and discriminates between adjusted and maladjusted couples. So it is recommended for clinical and research purposes. All items of this scale have been taken from models designed by researchers of family problem solving theory, so it has content and structural validity. Fpss can be interpreted according to the following criteria and t distribution where the mean is 100 and SD is 19.

Problem and solution-focused therapies are approaches that focus on expedient problem resolution for couples, rather than on protracted work toward personal growth, underlying emotional issues, or general communication skills (Shoham *et al*., 1995). These therapies focus not only on how partners behave in the situation of conflict, but also how they view the problem. The two therapies, problem and solution focused, differ somewhat in their balance of behavioral versus cognitive change and their manner of reinforcing change, but they are quite similar in their focus on parsimonious therapeutic work toward single problem resolution (Shoham *et al*., 1995).

The results show the average score of people in Fpss is about 103±19. The minimum score is 30, the maximum is 150 and the total score variance is 346. Percentage points are as follows: 10 (177), 20 (85), 25 (89), 30 (94), 40 (99), 50 (106), 60 (111), 70 (117), 75 (118), 80 (120), 90 (125).

In addition to the following categories, percentiles and percentage points can be used to interpret scores.

1.	>141	Extremely good at solving problems
2.	121-140	Good at solving problems
3.	101-120	Above average at problems
4.	81-100	Average at solving problems
5.	65-80	Weak at solving problems
6.	<65	Extremely weak at solving problems

Studies show there is a significant relationship between problem solving strategies and marital satisfaction. For example a related study proposes that the relationship between communication skills (as a part of problem solving strategies) and marital satisfaction is not simple and straightforward, but rather is quite complex, varying as a function of several moderating factors skill type, marital distress, gender and analytic unit (couple, self, or other). Analyses revealed that the magnitude and even the direction of the associations varied as a function of the moderating variables. In particular, skills and satisfaction were positively associated among no distressed couples, but were negatively associated among distressed couples (Burleson and Denton, 1997). The couples who have more marital satisfaction use constructive strategies to effectively solve their problem (negotiation and honesty). In contrast, maladjusted couples are weak at using problem solving and use isolation and silent treatment strategies (Kriegelewicz, 2006). The level of Education also related to problem solving abilities, in our study the level of education in 53.6% of all cases were above high school diploma and in 19.1% were under high school, related studies indicate that education is a key factor in choosing spouse (Proudfoot, 2007), so this variant is of great importance and should be evaluated in next studies.

Gender, race, culture, economy, education etc may affect the process of family problem solving. Related findings suggest that when couples share in turning to religion as a source of coping, this may be associated with improved problem-solving, but sole engagement in religious coping by wives may be associated with worse problem-solving (Yoshimato *et al*., 2006). For instance, it has been observed that men and women pay attention to different aspects of an argument. Men usually control the emotional load of arguments while women try to exaggerate the subject (Ball *et al*., 1995). These differences have not been in the scope of this study. Another study indicates that t wives who attributed other couples' marital problems to undesirable personality traits or negative attitudes were more likely to verbally criticize their husbands in the problem-solving discussion. A self-report measure of angry response style also showed the same positive association with negative attributions (Doherty, 1982). We hope to consider them and their association with culture in our next studies.

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