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Effect of Problem-solving Training on Mental Well-being and Cognitive Emotion Regulation in Couples

Mohadeseh Ebrahimi[1], Keivan Kakabaraee[1,*]

1. Department of Psychology, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran

***** ***Corresponding author:*** Keivan Kakabaraee, Department of Psychology, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran. Tel: 09122257860; Email: keivan@iauksh.ac.ir

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Abstract

Background: Problem-solving training is a therapy method where individuals develop the ability to use their cognitive skills effectively to deal with difficult interpersonal situations.

Objectives: This study aimed to assess the impact of problem-solving training on couples' mental well-being and emotional management.

Method: This quasi-experimental research was conducted based on a pretest-posttest control group design. The statistical population consists of couples experiencing marital conflict in Kermanshah in 2022. To narrow down the population, 30 couples were purposefully selected and then randomly assigned to either the experimental group (15 couples) or the control group (15 couples). Both groups were asked to complete online questionnaires, including The Cognitive Emotion Regulation Questionnaire, Positive and Negative Affect Schedule, and Satisfaction with Life Scale. The experimental group then participated in a program focused on problem-solving within families, consisting of 10 weekly sessions, each lasting 60 min. On the other hand, the comparison group did not partake in any program. The data were analyzed in SPSS software (version 26) using multivariate analysis of covariance.

Results: The examination of the data obtained before and after the training revealed that in both groups, problem-solving training demonstrated a noteworthy correlation with mental well-being and cognitive emotion regulation of couples ($P<0.05$).

Conclusion: As evidenced by the results of this study, problem-solving training has a significant association with the mental well-being and cognitive emotion regulation of couples. Put simply, couples who receive more problem-solving training tend to have higher levels of mental well-being.

Keyw**ords:** Cognitive emotion regulation, Couples, Mental well-being, Problem-solving training

1. Background

Family, an innate and everlasting institution, is the fundamental reason for the formation and reinforcement of all other social institutions and organizations (1). Numerous studies pointed out that the quality of the marital relationship dramatically affects various aspects of family dynamics, such as the stability and longevity of the marriage, the happiness of the spouses, and the well-being of the children. Theories related to mental well-being propose that changes in satisfaction within specific domains, such as marital and sexual satisfaction, can impact overall life satisfaction (2). Well-being encompasses various approaches through which individuals assess their lives and is an essential element of a fulfilling life. An existence lacking in enjoyment, feelings, and a sense of fulfillment and direction yet filled with dissatisfaction, rage, and sadness cannot be considered perfect (3).

In their study, Khosravi et al. (2018) revealed that religious attitudes had a negative and significant effect on attitudes towards marital infidelity, while mental well-being also had a substantial impact on these attitudes. Furthermore, mental well-being acts as an intermediary in the relationship between religious belief and one's inclination toward marital infidelity. Essentially, religious belief can diminish one's propensity for marital infidelity by influencing one's mental well-being (4). According to Ziaee et al. (2017), marital satisfaction and sexual satisfaction progressively decline within the first five years of marriage. Nonetheless, life satisfaction and happiness exhibit a non-linear trend, with a joint decrease in the first three years, followed by an upward trajectory. In conclusion, it is crucial to prioritize identifying the fundamental factors that contribute to both marital and sexual satisfaction in women, as doing so can significantly enhance their overall sense of happiness and life satisfaction. The aforementioned issues can provide a strong foundation for a married couple's relationship in the following years of their partnership (5).

A wide array of studies have demonstrated that when people face stressful life events, cognitive emotion regulation strategies are employed and affect initial emotional responses and subsequent processing (6,7). The assessment of one's cognitive system in the context of unfavorable events is a crucial aspect, as mental well-being is a product of the interplay between cognitive order-seeking strategies, emotional experiences, and accurate appraisals of stressful situations (8). Garnevsky et al. introduced nine cognitive strategies that different people use to regulate their emotions. They have distinguished between these nine cognitive regulation strategies, which include five adaptive strategies (including acceptance, positive refocusing, refocusing on planning, positive reappraisal, and perspective taking) and four maladaptive strategies

(including self-blame, rumination, catastrophizing, and blaming others) (9). Therefore, when emotional information cannot be perceived and evaluated in the process of cognitive processing, the person becomes emotionally and cognitively confused and helpless, and this inability disrupts the organization of one's emotions and cognitions (10). Cognitive perspectives are crucial in exploring the correlation between emotion regulation strategies and emotional disorders (11).

Individuals who employ a blame strategy when confronted with stressful life events or blame others are more likely to experience symptoms of depression compared to others (12). Consequently, the prevalence of emotion regulation issues in both clinical and non-clinical samples, as well as the significance of emotion regulation in daily life, necessitates the utilization of effective and innovative therapies to enhance emotional processes in couples during this sensitive phase of life (13). The impact of cognitive strategies for regulating emotions and distress tolerance on the life satisfaction of addiction-prone students, with resilience as a mediator.

The results of a related study revealed that positive strategies for regulating cognitive emotions were directly and indirectly related to the life satisfaction of students who were prone to addiction (14). Moreover, with the mediation of resilience, these strategies had a stronger indirect relationship with life satisfaction (15). On the other hand, distress tolerance had a significant relationship with life satisfaction in addiction-prone students, but only through the mediation of resilience. This suggests that strengthening positive cognitive emotion regulation strategies and distress tolerance skills could be beneficial in the development of preventive interventions and resilience training programs, ultimately leading to increased life satisfaction among students at risk of addiction (16). Numerous studies have highlighted that employing effective and efficient problem-solving strategies can have a positive impact on marital satisfaction and mental well-being (17-19), reducing the occurrence of domestic violence (20-21), depression, anxiety, parent-adolescent conflict, neuroticism, and stress (19). A systematic review reported that problem-solving-based learning enhances graduates' proficiency in various areas, including technical, social, cognitive, managerial, and educational research skills and knowledge (22). On the contrary, problem-solving is an integral aspect of critical thinking. Problem-solving training offers a structured approach to finding solutions and consequently plays a vital role in behavior modification and improving efficiency (23).

In the process of instructing on problem-solving methodologies, the initial and crucial step involves identifying the problem at hand. Thereafter, the problem is defined using the available information. Individuals can find the optimal solution through such techniques as brainstorming, utilizing alternative methods, and considering different perspectives. In the same context, Abolqasmi et al. (2019) conducted a study on the effectiveness of teaching problem-solving and decision-making skills on the family function of women experiencing marital conflict. The results of their analysis revealed that training in problem-solving and decision-making significantly improved positive emotions and reduced anxiety in the experimental group compared to the control group (24). Ebrahimi & Haghayegh (2019) examined the impact of problem-solving training on male students with attention deficit-hyperactivity disorder and oppositional defiant disorder. Their findings indicated a significant difference between the test and control groups in various aspects, such as attention-deficit/hyperactivity disorder, confrontational disobedience, behavior, signs of attention deficit, hyperactivity, theft, and deception. The control group exhibited more externalized behavioral symptoms compared to the test group. Nevertheless, research indicated that problem-solving training can be an effective treatment to alleviate these symptoms (25). Chen et al. (2020) demonstrated that problem-solving training can enhance understanding between spouses and prevent marital conflicts. The effectiveness of problem-solving training programs in addressing behavioral issues has been moderately successful (26).

2. Objectives

Although multiple studies have explored the effects of problem-solving training on cognitive and emotional processes, there is a lack of research on how it affects mental well-being and cognitive control of emotions in romantic partners. Considering the significance of problem-solving and decision-making skills in the optimal functioning of families and the reduction of psychological disorders in the family environment, as well as the lack of comprehensive studies on the mechanism of these skills, the present study aimed to explore the effects of problem-solving training on mental well-being and cognitive regulation of emotions in couples. The main objective of this research is to examine the impact of problem-solving training on mental well-being and cognitive regulation of emotions among couples in Kermanshah in 2022.

3. Methods

This quasi-experimental research was conducted based on a pretest-posttest control group design. The statistical population consisted of couples experiencing marital conflict in Kermanshah in 2022. To narrow down the population, 30 cases were purposefully selected and then randomly assigned to either the experimental group (15 couples) or the

control group (15 couples). The inclusion criteria required that couples have marital problems and willingly participate in a problem-solving program. On the other hand, the exclusion criteria entailed a lack of collaboration, absence from training sessions, and incorrect tasks. The sample size for the study was determined by looking at similar studies and utilizing G*Power software values (effect size=1.48, 1−β=0.95, and α=0.05) (27). Participants in the experimental group could withdraw from the study if they were not willing or satisfied. Both the experimental and control groups completed pre-test questionnaires before the commencement of the training sessions (Table 1). The experimental group then received 10 60-minute sessions that followed a family-oriented problem-solving program, while the control group did not receive any training during this time (17). Finally, both groups completed post-test questionnaires after the training sessions.

After setting up the experimental and control groups and making necessary arrangements with participants, the initial stage consisted of forming a digital group. During a meeting, the participants were briefed on research objectives and provided with information regarding the problem-solving training program. Permission was provided to use a preexisting link for organizing meetings, distributing surveys, and gathering answers. Subsequently, 15 couples were randomly selected from the completed questionnaires and included in the experimental group. Following that, the trainers determined the timetable for the training sessions that would take place in the Sky Room platform. The group received a problem-solving training program consisting of 10 60-minute sessions, conducted weekly on Saturdays and Wednesdays from 7-8 in the evening. The control group, on the other hand, did not receive any training programs during this period. Due to the prevalence of the COVID-19 pandemic during the research period, online questionnaires were designed and administered to both the experimental and control groups. Before and after the training, both groups completed two sets of questionnaires, which were subsequently analyzed and used for statistical analysis.

Research tools

Cognitive Emotion Regulation Questionnaire (CERQ) is an 18-item tool developed by Garanfski et al. (2007) to assess cognitive regulation strategies of emotions in response to life-threatening and stressful events (9). This questionnaire utilizes a five-point scale ranging from 1 (never) to 5 (always) to ascertain the frequency of these strategies. The CERQ consists of nine subscales: self-blame, refraining from blame, focus on thinking/ruminating, catastrophizing, undercounting, positive refocusing, positive reappraisal, acceptance, and refocus on planning. Each subscale has a minimum score of 2 and a maximum score of 10, with higher scores indicating a greater utilization of that specific cognitive strategy. The two items within each subscale are summed to calculate the score for each of the nine subscales. The total score of the subscales assessing low importance, namely positive refocus, positive reevaluation, acceptance, and refocus on planning, is divided by 10 (the number of subjects) to obtain the score for compromised strategies. In a similar vein, the total score of the subscales measuring self-blame, other-blame, focus on thought/rumination, and catastrophizing is divided by 8 (the number of items) to obtain the score for uncompromising strategies. In Iran, Cronbach's alpha subscale ranges from 0.64-0.82 (28).

Satisfaction with Life Scale (SWLS), developed by Diener & Emmons (1985), is a shortened version of the Life Satisfaction Scale that measures the cognitive aspect of individuals' mental well-being (29). Participants rate items on an eight-point Likert scale (ranging from 0, indicating complete disagreement, to 7, indicating complete agreement), with higher scores suggesting higher levels of overall life satisfaction. The scores on this scale range from 0 (lowest) to 35 (highest). In an Iranian sample, in a study by Gadermann (2010), Cronbach's alpha coefficients were reported as 0.80, 0.81, and 0.84 for parents of typically developing children, parents of children with exceptionalities, and for both groups combined, respectively (30)."

Positive and Negative Affect Schedule (PANAS) was utilized in this research to examine the emotional aspect of overall happiness. The study employed 20 personality characteristics based on the PANAS (31). The PANAS is a reliable questionnaire designed to assess an individual's emotions and feelings, with questions organized into positive and negative affect categories. Respondents answer these questions using a five-point Likert scale. Within this scale, a score of (1) indicates no or minimal experience of excitement, while a score of (5) signifies a very intense experience of excitement. Each subject's positive emotion score was determined by adding up the scores of the participants for each of the 10 adjectives that represent positive emotions (interested, excited, strong, enthusiastic, proud, alert, tasteful, determined, conscious, and active). Similarly, the negative emotion score was calculated by summing up the participants' scores for each of the 10 adjectives representing negative emotions (anxiety, upset, guilt, terrified, hostile, irritable, ashamed, nervous, restless, and fearful). In their study, Shokri et al. (2014) found that for parents of normal children, the Cronbach's alpha coefficients for positive and negative emotion scales were 0.76 and 0.81, respectively, while for parents of exceptional children, these values were calculated at 0.75 and 0.77 (32). In both samples, Cronbach's alpha coefficients were 0.78 for the positive emotion scale

and 0.81 for the negative emotion scale.

Data analysis

Explain about the old data of the article.The type of statistical analysis method is expressed.

To investigate the research queries and suppositions, the statistical information obtained from descriptive (mean and standard deviation) and inferential tests were examined using the SPSS software (version 26). The homogeneity of the variance-covariance matrix is one of the underlying assumptions of employing the multivariate covariance analysis test, and the M-box test is implemented to assess this assumption. If the results of the M-box test are not statistically significant, it implies that the assumption of homogeneity of the variance-covariance matrix has been satisfied. In the same way, it is essential to consider the assumption of equal variances when employing the analysis of covariance statistical test. Levine's test is employed as a means to evaluate this hypothesis. If the results of Levine's test do not display any statistically significant outcomes, it suggests that the assumption of equal variances has been fulfilled. Alongside the F value obtained from Levine's test, we can infer that there is no substantial distinction at a significance level of α=0.05. Therefore, the null hypothesis, which assumes equal variances, is accepted.

4. Results

In this study, 63.3% of participants were under 25 years old, while 36.7% fell between the ages of 26 and 40. In terms of educational background, 30% of subjects have completed a diploma, 46.7% had a bachelor's degree, and 23.3% possessed a qualification higher than a bachelor's degree (Table 2).

Table 3 shows the data concerning the description and distribution of mental well-being among the individuals being tested.

The results in Table 4 indicate a significant difference in the mean scores of mental well-being scales between the control and experimental groups. Consequently, the mental well-being scales differ significantly between the experimental group, which received problem-solving training, and the control group, which did not receive any intervention. Moreover, the experimental group outperformed the control group, thereby confirming the first research hypothesis.

Table 1. Family-oriented problem-solving training program

Sessions	Objective	Content
First	Understanding the concept of marriage	Explaining the objectives of the workshop and examining its importance
Second	Acquiring problem-solving abilities	I comprehend others' emotions and motivations, seek alternative answers, evaluate the impacts of actions, and create step-by-step plans.
Third	Examining different types of emotions	It highlights the significance of acknowledging and communicating emotions in everyday life while engaging with one's partner.
Fourth	Practicing active listening	Delving into the role of active listening in problem-solving, especially when communicating with a spouse
Fifth	Analyzing motives for better understanding	We are exploring various causes for behaviors to distinguish deliberate or aggressive actions from unintentional or accidental ones
Sixth	Assessing different potential solutions	Discovering alternative solutions by promoting critical thinking and discussing hypothetical scenarios with illustrative examples
Seventh	Considering the outcomes and consequences	Exploring problem-solving dialogues in both fictional and real-life contexts
Eighth	Applying sequential planning for better control	Developing a step-by-step action plan to achieve the desired outcome, anticipate potential challenges, and allocate time for various tasks
Ninth	Integrating problem-solving skills and question review	Assessing the participants' understanding of the acquired skills through interactive Q&A sessions
Tenth	Reflecting on learned material and self-evaluation	Concluding the problem-solving discussion by summarizing the approaches taken, analyzing the outcomes, and implementing an evaluation process

Table 2. Frequency distribution of education variable in research units

Variable		Frequency	Frequency %
Age	Under 25 years old	19	63/3
	26-40 years old	11	36/7
Education	Diploma	9	30
	Master's degree and bachelor's degree	14	46/7
	Above bachelor's degree	7	23/3

Table 3. Descriptive indices and normality of the mental well-being variable in the experimental group

	Sub Scale	Mean	Standard deviation	K-S	P
Life Satisfaction	Pre-test	16.06	2.52	0.94	0.33
	Post-test	20.06	1.83	0.58	0.87
Positive Emotion	Pre-test	24.33	2.05	0.91	0.37
	Post-test	30.80	2.59	0.52	0.94
Negative Emotion	Pre-test	29.80	2.95	0.54	0.93
	Post-test	23.33	3.28	0.80	0.54

Table 4. Results of multivariate covariance analysis of mental well-being variable scores in post-test

Source	Dependent Variable	SS	df	MS	F	P	Eta
Group	Life Satisfaction	21.05	1	21.05	13.71	0.001	0.354
	Positive Emotion	35.41	1	35.41	16.66	0.001	0.400
	Negative Emotion	32.99	1	32.99	11.68	0.002	0.319

Based on the results and the F value reported in Table 5, there exists a notable distinction in the mean post-test scores of the cognitive emotion regulation subscales between the experimental and control groups. As a result, a significant distinction is observed in the cognitive regulation of emotion scale between the experimental group, which received problem-solving training, and the control group, which did not receive any intervention. Furthermore, the experimental group outperformed the control group, thereby confirming the second research hypothesis.

Table 5. Results of multivariate analysis of covariance of cognitive emotion regulation scale in post-test

Source	Dependent Variable	SS	df	MS	F	P	Eta
Group	Positive refocusing/planning	56.80	1	56.80	19.63	0.001	0.483
	Positive evaluation/broader Perspective	17.25	1	17.25	13.05	0.002	0.383
	Blaming others	17.23	1	17.23	15.33	0.001	0.422
	Self-blame	7.48	1	7.48	10.58	0.004	0.335
	Rumination	4.65	1	4.65	12.78	0.002	0.378
	Catastrophizing	10.34	1	10.34	12.10	0.002	0.366
	Admission	5.09	1	5.09	11.93	0.002	0.362

5. Discussion

Based on the calculated F-score, there was a noticeable distinction in the mean scores of mental well-being measurements between the experimental and control groups after the intervention. Therefore, it can be concluded that the mental well-being measurements between the experimental group, who received problem-solving training, and the control group, who did not receive any intervention, differ significantly, with the experimental group exhibiting superior performance. The findings of the present study are consistent with the earlier research conducted by Deniz (18), Aburezeq & Kasik (19), Taghizadeh et al. (21), and Abolghasemi et al. (24). The findings of this study can be compared to the results of earlier research that examined similar factors. The outcomes of the present study are in line with previous findings, which have demonstrated the role of problem-solving abilities in diminishing emotional distress [20] and enhancing mental well-being (22). People who feel more in control of their emotions and mental well-being tend to employ problem-oriented strategies (19). This process modifies the impact of stress on mental health and well-being, an aspect that consistently attracts attention from researchers, health professionals, clinical psychologists, and educational officials (21,24).

Teaching couples problem-solving skills in a critical phase of life can be beneficial, as per the findings of this study. Daily tasks are often performed automatically without conscious awareness; nonetheless, it is crucial to note that individuals' daily lives can unravel without the ability to recognize issues and find viable solutions. Problem-solving encompasses emotional, cognitive, and behavioral aspects (24-26). People with strong problem-solving skills are more adept at handling various forms of stress and challenges in life. On the other hand, those who learn problem-solving skills can effectively confront stress. A greater tendency towards problem-solving is associated with fewer psychological and social difficulties. Problem-solving is a distinct cognitive and behavioral process that provides potentially successful strategies for tackling challenging situations (19,22). Choosing the most effective answer from multiple options is more likely when problem-solving ability is high (25). People's response to a situation is dramatically affected by their orientation toward it. An orientation that promotes independent problem-solving involves being prepared and open to the idea that challenging situations are a natural part of life that can be managed. The ability to resist the impulse of immediate response is critical to professional conduct. Believing in one's ability to control the environment significantly enhances the likelihood of successfully tackling the arising problems (26).

Based on the F value obtained from the fourth chapter, there is a notable distinction in the mean scores of the post-test subscales measuring cognitive emotion regulation between the control and experimental groups. Therefore, there is a considerable distinction in the cognitive regulation of emotion scale between the experimental group, which received problem-solving training, and the control groups that did not undergo any intervention, with the experimental group exhibiting superior performance. The correlation coefficient analysis indicated that the cognitive regulation of emotions, which is widely acknowledged, is positively affected by problem-solving training. This finding is consistent with previous studies conducted by Abolqasmi et al. [24], Ebrahimi & Haghayegh, (25), and Chen et al. (26). In

a similar vein, Aburezeq & Kasik (2022) revealed that problem-solving training is closely linked to psychological well-being and is considered the primary predictor of such well-being (19).

Another study pointed out that emotional intelligence, social support, self-efficacy, and psychological well-being were strongly interconnected. Individuals who excel in problem-solving will probably exert more effort and persistence, resulting in less disappointment and a more positive attitude toward their environment, thereby fostering compatibility with the aforementioned environment (33). Furthermore, problem-solving education acts as a cognitive mediator, influencing individuals' cognition, thoughts, and emotions (20). This outcome is not surprising, as problem-solving training assists learners in effectively managing and controlling negative events, new experiences, or stressful academic situations, thereby safeguarding them against various psychological issues. In addition, problem-solving training, which encompasses an individual's positive perception of their abilities, can serve as a foundation for establishing, sustaining, and enhancing psychological well-being. In essence, if couples envision themselves confronting goals, challenges, and occasional setbacks and believe in their ability to overcome these obstacles, they can enhance their mutual engagement in life together (24).

The constraints of every study are affected by the subject matter, extent, and accessible resources. The limitations of this particular research have been identified and discussed. One limitation is the lack of follow-up in subsequent years, which would have provided insight into the long-term effects of the training. Another limitation is the small sample size, as the research was conducted exclusively on women, making it difficult to generalize the findings to the larger population. Furthermore, it is worth noting that participants, despite their comparable educational backgrounds, may not fully reflect the diverse social, economic, and cultural circumstances prevailing in the broader society. The COVID-19 pandemic prompted the administration of online surveys to couples, which presented difficulties in data gathering. Future research should address these limitations by conducting longitudinal studies to show the continuity of results, increasing the sample size to enhance generalizability, and targeting a broader range of participants. Reproducing the current research with different samples can further validate the obtained results. Ultimately, it is advised to incorporate males into the training program to attain a broader comprehension.

6. Conclusion

As evidenced by the results of this study, problem-solving training has a notable correlation with mental well-being and cognitive regulation of emotions among couples. Put simply, couples who receive more problem-solving training tend to have higher levels of mental well-being.

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Conflicts of interest

The authors declare that they have no conflict of interest regarding the publication of this paper.

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