



Effectiveness of Teaching Problem Solving and Decision-Making Skills on Critical Thinking of Female-Headed Households

Yasser Rezapour Mirsaleh*¹

Saghar Ahmadi²

1. Associate Professor of Department of Counseling, Faculty of Social Sciences and Humanities, Ardakan University, Ardakan, Iran. (Corresponding Author)
2. M A in General Psychology. Faculty of Social Sciences and Humanities, Ardakan University, Ardakan, Iran M.A. in Psychology, Hekmat Razavi Institute of Higher Education, Mashhad, Iran.

ARTICLE INFO

Received: 16 November 2023
Accepted: 15 March 2024

Article Type

Research paper

Keywords:

Problem-Solving and
Decision-Making
Skills, Female-
Headed Households,
Critical Thinking

ABSTRACT

Female heads of households face various psychological and social challenges that significantly impact their lives. The objective of this study was to explore the impact of an intervention focused on teaching problem-solving and decision-making skills on the critical thinking abilities of female heads of households. This research employed a semi-experimental design with pre-test and post-test measures, including a control group. The study population comprised all female heads of households under the jurisdiction of the Welfare organization of Meybod city. Thirty participants were selected via purposive sampling and randomly assigned to either the experimental or control group (15 participants per group). The experimental group underwent a ten-session training program on problem-solving and decision-making skills, while the control group received no intervention. Both groups completed the California Critical Thinking Questionnaire before and after the intervention. The data were analyzed using multiple analysis of covariance (MANCOVA). The findings revealed that teaching problem-solving and decision-making skills significantly enhanced critical thinking among participants in the experimental group. This effect was observed across all three subscales of critical thinking (p -value < .01). These results suggest that instructing problem-solving and decision-making skills can effectively enhance the quality of critical thinking among female-headed households.

Citation: Rezapour Mirsaleh, Y & Ahmadi, S. (2025). Effectiveness of Teaching Problem Solving and Decision-Making Skills on Critical Thinking of Female-Headed Households. *Journal of Woman and Family Studies*, 12(4), 62-79. DOI: 10.22051/jwfs.2025.45633.3044

* **Correspondence:** y.rezapour@ardakan.ac.ir



Introduction

One of the most vulnerable segments of society comprises female-headed households, who often face heightened exposure to social discrimination and psychological pressures (Aghajanian & Thompson, 2013). Despite cultural and lifestyle changes over time, many individuals, particularly those in female-headed households, lack fundamental abilities and essential skills to effectively navigate specific challenges in their lives. This renders these women particularly vulnerable, impeding their ability to address their issues effectively. Critical thinking emerges as a crucial tool in problem-solving and enhancing quality of life, particularly for female-headed households, who require a diverse skill set to confront life's challenges (Meyer & Abdul-Malak, 2015). Critical thinking involves a mindset that elevates the quality of one's thinking through analysis, evaluation, and innovation. Cognitive skills associated with critical thinking, such as active inquiry, analytical reasoning, interpretation, and discernment of conclusions, enable individuals to challenge potential solutions, organize information, and reason through life decisions, thereby enhancing their adaptability and creativity (Saputri et al., 2020). Critical thinking has risen as a prominent goal of higher education and is now acknowledged as an essential skill that students should develop. In contemporary society, critical thinking stands out as a paramount objective and an indispensable skill (Prayogi et al., 2019). Furthermore, critical thinking skills are "also highlighted as a significant educational goal in various national settings. However, there has been minimal discourse on how critical thinking is demonstrated within African contexts. Critical thinking skills are recognized as a crucial learning outcome across various contexts (Giacomazzi et al., 2022). The results suggest that integrating problem-based learning and narrative reading effectively enhances students' critical thinking skills. Notably, this teaching approach plays a pivotal role in helping students cultivate the ability to analyze, assess credibility, and thrive as proficient decision-makers and problem solvers (Bendraou & Sakale, 2023).

The primary barrier to effective critical thinking, often leading to challenges, is defensive behavior. One common error among close-minded thinkers is their tendency to prematurely settle on a broad classification of solutions, halting further exploration. Consequently, they confine themselves to initial options and fail to entertain alternative perspectives (Dado & Bodemer, 2017). Critical thinking enables individuals to articulate reasons for the validity or fallacy of issues, as well as generate problem-solving strategies to surmount obstacles. This involves scrutinizing and analyzing information, identifying hypotheses and alternatives, engaging in reasoned and open-

minded discourse, posing inquiries to oneself and others, and rigorously testing potential solutions (Rouijel et al., 2019).

The capacity for critical thinking is bifurcated into two dimensions: skills and disposition. Recent research has placed emphasis on skill-related metrics of critical thinking, encompassing aspects like analysis, inference, evaluation, and decision-making (Wahyudi et al., 2019).

Certain researchers have underscored critical thinking as a highly significant and foundational skill in problem-solving and decision-making (Ay et al., 2015). Conversely, problem-solving and decision-making are skills that exert an influence on critical thinking (Darmawat & Mustadi 2023). Teaching problem-solving skills impacts the comprehension of phrase meanings, the identification of ambiguity in reasoning, drawing logical conclusions, and grasping coherence in evaluating the credibility of sources for claims (Naderi et al, 2021).

Problem-solving is an essential skill for navigating tasks in life, demanding deliberate and purposeful strategies. It involves defining problems, deciding on a solution, and implementing problem-solving strategies (Cooke & Kemeny, 2017). Indeed, problem-solving methodology constitutes an active learning approach, encompassing five key steps: identification and definition of the problem, gathering information, forming initial conclusions, testing outcomes, and assessing and making decisions (Altintas & Ozdemir, 2012).

Utilizing problem-based learning models in environmental problem-solving activities nurtures students' critical thinking abilities and cultivates an environmentally conscious mindset. (Saiful et al, 2020). As students grapple with problem-solving tasks, they become actively immersed in the quest for solutions to the challenges at hand. This engagement heightens their realization of the importance of taking tangible steps to address problems presented by their teacher. (Darmawati & Mustadi, 2023). Teaching problem-solving skills empowers individuals to navigate real-life situations and develop the capacity to make informed decisions by tackling authentic problems (Gregory & Chapman, 2013).

The concept of decision-making involves selecting the alternative with the most advantages or the highest likelihood of successful implementation. A logical decision-maker relies on statistical information, objective facts, and a rational framework rather than guesswork (Asgharpour & Ghasvand, 2016). Proficient decision-making serves as the pivotal factor in actively shaping events rather than passively awaiting their occurrence. Decision-making is typically categorized into prescriptive and descriptive types, each contributing to more effective decision-making (AliakbariDehkordi, 2018).



Additionally, problem-solving and decision-making skills enhance logical thinking, which, in turn, contributes to the development of critical thinking (Uzunöz & Demirhan, 2017).

From these perspectives, it can be deduced that critical thinking involves participating in logical decision-making procedures, where the potential consequences of accepting or dismissing a given proposition are thoughtfully deliberated. Throughout the process of problem-solving, individuals have the opportunity to enhance their critical thinking abilities (Huda & Umam, 2019). Hence, this study focused on teaching problem-solving and decision-making skills as a means to enhance critical thinking.

Problem-solving and decision-making skills serve as foundational skills that enhance critical thinking indirectly by equipping individuals with structured approaches to analyze situations, make informed choices, and evaluate outcomes. For female-headed households facing complex life challenges, developing these skills can lead to improved critical thinking through real-life applications and by reinforcing logical reasoning, which are essential for independent decision-making (Meyer & Abdul-Malak, 2015; Gregory & Chapman, 2013). When individuals engage in problem-solving, they become more motivated and capable of critical thinking and analysis. Consequently, problem-solving skills facilitate the development of critical thinking within a practical and tangible context. Effective problem-solving necessitates informed and rational decision-making, enabling individuals to evaluate the advantages and disadvantages of various options and select the most appropriate course of action (Botvin, 2019).

Research exploring the problem-solving and decision-making skills of female-headed households and their impact on critical thinking is sparse and in its nascent stages. Critical thinking developed through problem-solving can be readily transferred and applied across various situations and contexts. Teaching problem-solving is a practical, experiential approach that effectively enhances critical thinking. Problem-solving skills cultivate critical thinking within a dynamic and applied context, making their impact and retention more effective than direct instruction in critical thinking. Given the significance of these skills in mitigating the social challenges faced by female-headed households, further investigation in this area is warranted. Recognizing this imperative, the current study aims to assess the efficacy of an intervention focused on teaching problem-solving and decision-making skills in enhancing critical thinking among female-headed households. Therefore, the objective of the current study was to assess the effectiveness of an intervention focused

on teaching problem-solving and decision-making skills in enhancing the critical thinking abilities of female heads of households.

Methods

Study Design and participants

The present study was a semi-experimental study with pre-test and post-test design and control group. The statistical population of the study consisted of all female heads of household covered by the Welfare organization of Meybod city; a total of 30 women were selected using purposeful sampling and randomly assigned into experimental and control group (15 participants in per group) (Delavar, 2012). The inclusion criteria comprised being at least 20 years old, having a minimum of 2 years of welfare records, and having at least one child. Exclusion criteria included a history of psychological disorders, employment in governmental positions (due to a fixed monthly income), and receiving a monthly pension from organizations other than the welfare organization or another individual.

The experimental group participated in a ten-session training program on problem-solving and decision-making skills, with each session lasting two hours and conducted twice a week. Meanwhile, the control group was placed on a waiting list and did not receive any intervention. Following the intervention, both groups completed the California Critical Thinking Questionnaire. Data analysis was conducted using one-way analysis of covariance (ANCOVA) and multivariate analysis of covariance (MANCOVA).

In developing the protocol to assess the effectiveness of teaching problem-solving and decision-making skills on critical thinking, experts were consulted, and their insights were incorporated into the design. Key resources, including Mootabi et al. (2006) and similar references, provided valuable guidance for structuring the protocol. Additionally, the intervention program described by Sheivandi et al. (2023), which was based on Mootabi's framework, served as the primary model. However, the researchers of the present study made modifications and integrated additional techniques to enhance its applicability. After the initial draft was completed, the protocol underwent validation by Iranian experts and received formal approval.

While critical thinking can be taught directly, research suggests that experiential learning through problem-solving and decision-making provides a more practical and transferable approach to fostering critical thinking skills (Mootabi et al., 2006; Sheivandi et al., 2023). Problem-solving and decision-making involve key components of critical thinking, such as logical reasoning, evaluation of alternatives, and reflective judgment, within real-life contexts.



This approach enables participants to develop and apply critical thinking in a meaningful and engaged manner, leading to better retention and applicability in daily life. Additionally, problem-solving interventions have been found to be particularly effective in populations facing socio-economic challenges, such as female-headed households, as they equip individuals with practical skills for navigating complex decision-making scenarios (Mootabi et al. 2006).

The sessions were led by the researcher and supervised by a life skills expert in a group setting. To reinforce learning, participants were given homework assignments after each session, designed to build upon the material covered in the previous session. The group format facilitated discussion and the exchange of ideas, enhancing the effectiveness of the intervention and strengthening participants' problem-solving and decision-making skills. The sessions were conducted by one of the authors, who had the necessary expertise in this field. A detailed overview of the ten-session training program is provided in Table 1.

Each session targeted specific problem-solving and decision-making skills, including problem identification, solution evaluation, and strategy implementation. Activities such as role-playing, group discussions, and guided exercises allowed participants to practice decision-making in various scenarios. The sessions, conducted in a group format by a trained facilitator with expertise in life skills education, lasted approximately two hours and combined instructional content with interactive components. To ensure fidelity, the facilitator adhered to a structured protocol, utilizing a checklist to confirm the completion of key activities. Additionally, a senior researcher conducted periodic supervision to monitor adherence to the protocol.

Table 1. The content of Interventions sessions

| Session | goals | content |
|---------|---|--|
| First | Introducing the concept of problem solving and decision-making skills | This section provides a broad overview of the intervention sessions, focusing on understanding the concepts of problems and issues and discerning their differences. It also aims to raise awareness about the process of decision-making. |
| Second | Choosing the best solution for the problems | Exercises such as imagining positive glasses on the eyes, choosing the best positive solutions in different situations and paying attention to issues with a positive and wide view. |
| Third | Changing the attitude towards the problems | Methods and exercises aimed at understanding and discerning between correct and incorrect solutions. Engaging in discussions to evaluate the validity or fallacy of proposed solutions. |

| Session | goals | content |
|---------|---|--|
| Fourth | Discussing about positive and negative solutions | Defining a short story followed by collaborative exploration of solutions for the problems presented within the narrative. Identifying both correct and incorrect solutions through group consultation. Participants were tasked with evaluating solutions based on the benefits they offered in the given situations. They then engaged in discussions to review and justify their ratings. This exercise aimed to enhance participants' analytical understanding of costs and benefits, enabling them to determine the most suitable solution. |
| Fifth | Choosing the best: Cost benefit analysis | Engaging in simulated future scenarios through fictional storytelling, participants practice making sound decisions amidst various challenges and situations. This exercise enhances their ability to plan and resolve future problems effectively. |
| Sixth | The consequence of a right or wrong decision | Revising the stages of decision-making using story telling. Expressing and describing decision making steps for different situations and different people in the story. |
| Seventh | Learning the decision-making process | Predicting the continuation of stories across diverse topics, then verifying and filling in the gaps. This exercise hones the ability to make decisions and track their outcomes. |
| Eighth | Intellectual challenge and make decisions by envisioning their potential consequences | Defining a story that has different solutions for making a decision and asking about which way the participants choose and investigating the reason for that choice. Strengthen decision making ability according to different situations. |
| Ninth | Cognitive challenge and decision-making enhancement | Imagining the creation of a community in an empty city and practicing the ability to make group decisions to manage the city and strengthen the ability to consult and group thinking. |
| Tenth | People's participation in group decisions as an active member | |

To ensure the validity of the intervention protocol, we conducted a qualitative validation process by consulting experts in educational psychology and critical thinking development. To assess the content validity, a questionnaire was first administered to six experts. This questionnaire included several items evaluating the alignment of the protocol's content with its specific objectives, methods, and proposed solutions. Additionally, two quantitative measures—the Content Validity Ratio (CVR) and the Content Validity Index (CVI)—were employed to assess the validity of the interventional sessions based on expert evaluations. To ensure the robustness of the intervention protocol, a multi-step validation process was employed. This included (1) an initial review of existing evidence-based frameworks on



problem-solving and decision-making (Mootabi et al., 2006), (2) expert consultations to refine the content and structure, (3) a pilot study to test feasibility and effectiveness, and (4) quantitative validation using CVR and CVI to confirm content validity. Additionally, reliability analysis and internal consistency measures were conducted to verify the protocol's alignment with the study's objectives. The iterative refinement process ensured that the intervention effectively targeted critical thinking development while maintaining methodological rigor. Additionally, we conducted a pilot test with a small group to assess the protocol's effectiveness and made adjustments based on feedback. Quantitative assessments, including reliability analysis and internal consistency measures, further verified the protocol's suitability for the study's aims.

Measurements

California Critical Thinking Skills Test

This test comprises 37 questions, to be completed within 45 minutes by the participants. It serves as a standardized tool designed to assess fundamental critical thinking skills at the high school level and beyond (Facione & Facione, 1997). The test consists of three subscales: analysis, inference, and evaluation. Among the 34 items, 20 are four-choice questions, and 14 are five-choice questions. Participants are required to select the best answer from the provided options based on their judgment. Each correct answer carries one point, resulting in scores ranging from 0 to 34. The reliability of the Persian version of the California Critical Thinking Skills test has been reported to range between .75 and .91 (Mehrinejad, 2007). Using the Kuder-Richardson method, the reliability of the test was found to be .69, and through the test-retest method, it was .65. The construct validity of the scale was also confirmed (Askari & Maleki, 2010). The California Critical Thinking Skills Test (CCTST) has been used in studies across various cultural contexts, including adaptations and validations in Iran. For this study, we selected the Persian version of the CCTST, previously adapted and validated for Iranian populations by (Khalili & Hosseinzadeh, 2003), to ensure cultural appropriateness and relevance.

Findings

The mean and standard deviation of age in the experimental group are 32.46 and 6.19, respectively, and the mean and standard deviation of the age of the control group are 31.78 and 7.09, respectively. In the experimental group, 3 participants had one child, 5 had two children, 4 had three children,

and 3 had more than three children. Similarly, the control group showed a comparable distribution: 2 participants had one child, 3 had two children, 5 had three children, and 5 had more than three children. In the experimental group, 4 participants had completed primary education, 3 participants had completed middle school, and 8 participants had completed high school or obtained a diploma. In contrast, the control group consisted of 3 participants with primary education, 5 participants with middle school education, and 7 participants with high school education or a diploma. The mean and standard deviation of the scores of experimental and control groups in critical thinking, separated by pre-test and post-test, are represented in Table 2.

Table 2. The mean and standard deviation of the critical thinking at pre and post test

| Variables | Stage | Experimental group | | Control group | |
|-------------|-----------|--------------------|--------------------|---------------|--------------------|
| | | Mean | Standard Deviation | Mean | Standard Deviation |
| Total score | Pretest | 6.54 | 1.75 | 5.18 | 2.60 |
| | Post-test | 8.54 | 2.66 | 5.63 | 2.42 |
| Analysis | Pretest | 1.83 | .72 | 1.67 | 1.01 |
| | Post-test | 2.36 | .78 | 1.79 | .96 |
| Inference | Pretest | 2.55 | .96 | 1.89 | .94 |
| | Post-test | 3.28 | 1.06 | 1.86 | .82 |
| Assessment | Pretest | 2.16 | .82 | 1.62 | .88 |
| | Post-test | 2.90 | .75 | 1.98 | 1.07 |

As can be seen, the average score of critical thinking in the pre-test phase in the experimental and control groups doesn't have much difference, but in the post-test phase, there is a difference between the two groups and the critical thinking scores of the experimental group have increased. Covariance test was used to test the main hypothesis of the present study. The presuppositions of this test, including the normality of the distribution of scores, the homogeneity of variances in the experimental and control groups, and the homogeneity of the regression slope were analyzed and confirmed. After confirming the presuppositions, the covariance test was performed, the results of which are represented in Table 3. As shown in Table 2, considering that the F value calculated for the effect of groups ($F = 8.43$) is greater than the critical F value with degrees of freedom ($df = 27$ and 1) at the significance level of $\alpha = .05$ (4.34), the null hypothesis indicating the equality of the mean

of the total score of the participants' critical thinking in the experimental and control groups in the post-test phase is rejected with 95% certainty.

Table 3. The results of the analysis of covariance for comparing the post-test scores of the total critical thinking score after adjusting the pre-test scores

| Source of changes | Sum of squares | DF | Mean of squares | F value | p-value | Effect size |
|-------------------|----------------|----|-----------------|---------|---------|-------------|
| Pretest | 7.71 | 1 | 7.71 | 1.21 | .286 | .32 |
| Group | 53.96 | 1 | 53.96 | 8.43 | .009 | .67 |
| Error | 121.56 | 27 | 6.40 | | | |
| Total | 1282.00 | 30 | | | | |

Therefore, considering to the fact that the average scores of experimental group participants is greater than that of the control group during the post-test phase, it can be concluded that intervention in the experimental group has increased their total scores of critical thinking in the post-test phase. In the other word, teaching problem solving and decision-making skills has led to an increase in the total critical thinking score of the experimental group participants. The effect size indicates that the 31% increase in the total score of critical thinking of the participants in the experimental group can be attributed to the training of problem solving and decision-making skills. Also, multiple analysis of covariance (MANCOVA) was used to test the sub-hypotheses of the study: the effect of teaching problem-solving and decision-making skills on critical thinking subscales (Table 4). Since the presuppositions of ANCOVA and MANCOVA are the same, we will not review the presuppositions again.

Table 4. The results of MANCOVA analysis to compare the post-test scores of the subscales of critical thinking in the experimental and control groups

| Analysis | Value | F | p-value | Effect size |
|-------------------------|-------|--------|---------|-------------|
| Pillais effect test | .746 | 15.410 | .0001 | .746 |
| Wilks' lambda test | .254 | 15.410 | .0001 | .746 |
| Hotelling-pabst test | 2.935 | 15.410 | .0001 | .746 |
| Roy's Largest Root test | 2.935 | 15.410 | .0001 | .746 |

As can be seen in Table 3, the F values are all significant and the sub-hypotheses of the research are also confirmed. In the other word, when the pre-test was controlled, the scores of at least one of the subscales of the critical thinking test in the post-test phase in the experimental group were significantly higher than the scores of the participants in the control group. Considering the significance of the F value in the MANCOVA test, the analysis of covariance was used in MANCOVA test so as to determine which

subscales of critical thinking were different in the two groups. The results are shown in Table 5.

Table 5. Results of analysis of covariance in MANCOVA's text on post-test scores

| effect | Source of changes | Sum of squares | Mean of squares | Mean of squares | F | p-value | Effect size |
|--------|-------------------|----------------|-----------------|-----------------|-------|---------|-------------|
| group | Analysis | 1.81 | 1 | 1.81 | 5.23 | .032 | .22 |
| | Inference | 12.97 | 1 | 12.97 | 11.75 | .003 | .38 |
| | Assessment | 2.88 | 1 | 2.88 | 5.48 | .031 | .23 |

As can be seen in Table 4, all the F values in this table are also significant, indicating that the scores of the participants of the experimental group in all three subscales of critical thinking in the post-test phase are significantly higher than the participants of the control group. The values of effect size demonstrate that 25.6% of the changes related to analysis, 33.8% of the changes related to inference, and 60.2% of the changes related to evaluation in the participants of the experimental group were the result of teaching problem solving and decision-making skills.

Discussion & Conclusion

The findings revealed that instructing problem-solving and decision-making skills significantly enhances critical thinking and its respective subscales among female-headed households. These results align with those of previous studies (Bendraous & Sakale, 2023; Darmawati & Mustadi, 2023; Gashtasbi & Ojinejad, 2014; Loraki & Parsapour, 2017; Hemmati et al., 2013; Beigi & Abedini, 2014; Nadri et al., 2021; Saiful et al., 2020). In elucidating this discovery, it can be asserted that problem-solving constitutes a cognitive-behavioral and inventive process, representing one of the fundamental thinking skills. By engaging individuals in addressing problems and formulating solutions and arguments, it fortifies critical thinking (Dakabesi & Luoise, 2019). The environment cultivated during problem-solving and decision-making intervention sessions serves as an apt stimulus for group discussions, inquiries, research, and discoveries, thereby enhancing reasoning skills and ultimately fostering critical thinking abilities (Hemmati Maslak Pak et al., 2013). Engaging in problem-solving allows individuals to connect different concepts and integrate them into real-world scenarios. This process undoubtedly stimulates the development of critical thinking skills (Pusparini et al, 2018).

The findings of this study align with previous research, such as Gregory and Chapman (2013) and Dakabesi and Luoise (2019), which underscore the effectiveness of problem-solving and decision-making interventions in fostering critical thinking. This study extends the literature by demonstrating



that these interventions can significantly benefit female-headed households, a demographic often facing unique socio-economic challenges. The results suggest that enhancing problem-solving and decision-making skills not only improves critical thinking but also empowers participants to navigate complex life situations, leading to increased psychological resilience and social well-being (Baker & Lupton, 2012). These findings have practical implications for welfare organizations and community centers, which could implement structured, ongoing training programs to support female-headed households in developing these essential life skills. Furthermore, exploring the impact of such training on children in similar socio-economic conditions may yield insights into fostering critical thinking in future generations, thus reinforcing the need for targeted interventions (Hemmati et al., 2013; Ebrahimi & Qoltash, 2022).

Critical thinking is defined as individuals' capacity to challenge their own thoughts, necessitating analysis and expansion of their standards (Molanorie, 2017). The instruction of problem-solving skills places individuals in situations where they test their hypotheses through research and personally draw conclusions. In such conditions, individuals can better apply their knowledge to solve similar problems. Consequently, the problem-solving model plays a crucial role in enhancing understanding and thinking, while augmenting components such as truth-seeking, open-mindedness, analytical power, organizational power, self-confidence, growth, and exploration, thus demonstrating the effectiveness of teaching problem-solving in fostering critical thinking (Ebrahimi & Qoltash, 2022). Active decision-making enables individuals to assess various aspects of choices and evaluate their consequences, thereby enhancing their power of thought and criticism. Therefore, since problem-solving and decision-making skills enhance the ability to analyze, evaluate, and select, they can effectively increase critical thinking components such as analytical thinking, understanding of diverse viewpoints, flexibility in evaluation, caution in judgment, and the desire to seek information. Critical thinking, as one of the most essential skills, enables female-headed households to conduct better analyses of the events around them, avoiding oversimplification and thereby evading the pitfalls of social harm and risks. Consequently, this group of individuals is anticipated not only to enjoy better psychological and social well-being but also to create a healthier living environment (Baker & Lupton, 2012). Based on the cases discussed, it is evident that exercises in problem-solving and decision-making skills are highly engaging and effective, leading to a clear enhancement in critical thinking. It is reasonable to anticipate an improvement in the quality of life for women with high levels of critical thinking skills. Based on the

findings of the present study, it can be inferred that training in problem-solving and decision-making skills can effectively enhance the critical thinking abilities of female heads of households. It is recommended that relevant organizations implement continuous and well-documented intervention programs aimed at providing such training to female-headed households. Additionally, it is suggested to explore the impact of problem-solving and decision-making skills on various facets of critical thinking among children lacking caregivers or those under the care of irresponsible individuals. To enhance the credibility of future research, it is advised to investigate the effectiveness of problem-solving and decision-making skills separately through extended training sessions, coupled with follow-up assessments to ensure the sustainability of the training effects.

These findings highlight the value of problem-solving and decision-making training as tools to enhance critical thinking among female-headed households. Developing these skills may empower participants to navigate complex challenges more effectively, which could lead to greater psychological resilience and social well-being. This study thus contributes to a growing body of literature suggesting that life skills training has a positive impact on vulnerable populations, particularly those facing unique socio-economic pressures. Our results align with previous research, such as studies by Gregory and Chapman (2013) and Dakabesi and Luoise (2019), which also found that problem-solving and decision-making interventions foster critical thinking. However, this study extends these findings to a culturally specific group of female-headed households, suggesting that such interventions can be beneficial across diverse cultural contexts. Practically, these findings suggest that welfare organizations and community centers could implement structured training programs focused on problem-solving and decision-making to enhance critical thinking in female-headed households. Such programs could be designed as ongoing workshops, with regular follow-up sessions to support long-term skill development and adaptation to real-life challenges.

The present study also encountered limitations that warrant consideration when interpreting the findings. Firstly, despite the specified inclusion criteria, such as excluding individuals receiving pensions from organizations other than welfare, there remained the possibility that individual variances among women, such as the presence of social support or the number of children, could influence both the quality of life and critical thinking, as well as the impact of problem-solving and decision-making skills training. Secondly, the absence of a follow-up test, due to constraints in implementation and difficulties in reassembling participants, may have compromised the sustainability of the training effect. One limitation of this study is the use of a purposeful sampling method, which may restrict the generalizability of the findings. Purposeful



sampling was chosen to select participants who met specific criteria relevant to the study objectives. However, because this sampling method does not provide a random or representative sample, the results may not be fully generalizable to all female-headed households. Future studies could enhance generalizability by employing random sampling techniques or by replicating the study across diverse populations and regions to further validate these findings. Another limitation is the small sample size (15 participants per group), which may reduce the statistical power and generalizability of the findings. Future studies with larger sample sizes are recommended to validate these results. The control group in this study did not receive any intervention, which may raise ethical considerations and impact the interpretation of the findings. Future studies could consider using a waitlist or active control group to address this limitation. Other limitation of this research was the absence of measurement for participants' problem-solving and decision-making skills. It is anticipated that as these skills improve, there would be a subsequent enhancement in critical thinking among participants. Therefore, assessing these variables would provide a more comprehensive basis for analysis and interpretation. Lastly, the limited number of training sessions may have posed challenges during the training process. Future studies could replicate this intervention with a larger, more diverse sample or explore the impact of similar skills training on other demographic groups. Additionally, further research could assess long-term outcomes of such interventions, helping to determine the sustainability of the effects on critical thinking and decision-making.

Ethical Consideration

In accordance with ethical standards, informed consent was obtained from all participants after they were fully informed about the study's purpose, procedures, potential risks, and benefits, ensuring that participation was voluntary and that they could withdraw at any time without penalty; participant confidentiality was maintained by anonymizing data and securely storing it in password-protected files accessible only to the research team; Participants were assured that they could access the research findings upon request. The study incurred no additional costs for members of either the experimental or control groups. Upon completion of the research, intervention sessions were offered to control group members who wished to receive the intervention. The study was approved by the Ethics Committee of Ardakan University, and a debriefing process was conducted to inform participants about the study's findings and provide them with relevant support resources if needed.

Ethical considerations of the research: This study was derived from the master thesis in Ardakan University.

Funding: There was no external funding for this study.

Authors' contribution: The first gathered theoretical framework and revised the manuscript and the second author implemented the project.

Conflict of interests: The authors declare that they have no conflicts of interest.

Acknowledgments: The authors thank all women who participated in this study.

Data availability: The data supporting this research are of no public access.

References

- Aghajanian, A., & Thompson, V. (2013). Female headed households in Iran (1976–2006). *Marriage & Family Review*, 49(2), 115-134. <https://doi.org/10.1080/01494929.2012.728558>. [Link]
- Ali Akbari Dehkordi, M. (2018). Developmental psychology (theories). Tehran: Paymnoor Press.
- Altintas, E., & Ozdemir, A. S. (2012). The effect of teaching with the mathematics activity based on purdue model on critical thinking skills and mathematics problem solving attitudes of gifted and non-gifted students. *Procedia-Social and Behavioral Sciences*, 46, 853857. <https://doi.org/10.1016/j.sbspro.2012.05.212>. [Link]
- Asgharpour, S., Majd, M. A., & Ghiasvand, M. (2016). Effect of educating problem solving and decision-making skills on mental health and resiliency of students. *IJABS*, 3, 9-14. <https://psycnet.apa.org/record/1992-97624-042>. [Link]
- Askari, M., & Maleki, S. (2010). Validation, standardization, and standardization of the California Test of Critical Thinking Skills for students. *Educational Measurement Quarterly*, 1(1), 1-23. <https://psycnet.apa.org/record/1992-97624-042>. [Link]
- Ay, F. A., Karakaya, A., & Yilmaz, K. (2015). Relations between self-leadership and critical thinking skills. *Procedia-social and Behavioral sciences*, 207, 29-41. <https://doi.org/10.1016/j.sbspro.2015.10.147>. [Link]
- Baker, R., & Lupton, M. (2012). Encouraging critical thinking in a combined Arts and Science course on the relationship between people and the environment. In *Proceedings of The Australian Conference on Science and Mathematics Education (formerly UniServe Science Conference)* (Vol. 9). <https://psycnet.apa.org/record/1992-97624-042>. [Link]
- Bendraou, R., & Sakale, S. (2023). The Impact of Problem-based Learning and Reading Stories on the Development of Moroccan Middle School Students' Critical Thinking Skills. *Journal of English Language Teaching and Applied Linguistics*, 5(2), 74-80.

- <https://doi.org/10.32996/jetal.2023.5.2.9>. [Link]
- Bigi, R., & Abedini, S. (2014). The effect of teaching decision-making skills on the critical thinking of nursing students. *Development strategies in medical education*; 1 (2): 18-26. <http://dsme.hums.ac.ir/article-1-68-fa.html>. [Link]
- Botvin, G. (2019). *life skills Training Student Guide 2 Botvin* (Promoting Health and Personal Development 2019). New York: Princeton Health Press. [Link]
- Cooke, A., & Kemeny, T. (2017). Cities, immigrant diversity, and complex problem solving. *Research Policy*, 46(6), 1175-1185. <https://doi.org/10.1016/j.respol.2017.05.003>. [Link]
- Dado, M., & Bodemer, D. (2017). A review of methodological applications of social network analysis in computer-supported collaborative learning. *Educational Research Review*, 22, 159-180. <https://psycnet.apa.org/record/1992-97624-042>. [Link]
- Dakabesi, D., & Luoise, I. S. Y. (2019). The effectiveness of problem-based learning model to increase the students' critical thinking skills. *Journal of Education and Learning (EduLearn)*, 13(4), 543-549. <https://doi.org/10.11591/edulearn.v13i4.12940>. [Link]
- Darmawati, Y., & Mustadi, A. (2023). The Effect of Problem-Based Learning on the Critical Thinking Skills of Elementary School Students. *Jurnal Prima Edukasia*, 11(2), 16-29. <https://psycnet.apa.org/record/1992-97624-042>. [Link]
- Delavar, A. (2012). Theoretical and practical foundations of research in humanities and social sciences. Tehran: Rushd Publications. <https://www.adinehbook.com/gp/product/9646115179>. <https://psycnet.apa.org/record/1992-97624-042>. [link]
- Ebrahimi Delaz, S., & Qaltash, A. (2022). The effectiveness of critical thinking problem solving teaching method and academic performance of sixth grade students in Birjand city. *Transcendent Education Quarterly*, 2(1), 93104.10.30495/ee.2022.1950428.1059. [Link]
- Facione, N. C., & Facione, P. A. (1997). Critical thinking assessment in nursing education programs: An aggregate data analysis. Millbrae, CA: *The California Academic Press*. <https://doi.org/10.4236/ce.2018.914175>. [Link]
- Gashtasbi, R., & Ojinejad, A. (2014). The Impact of Problem Solving Teaching on Creative and Critical Thinking in Elementary Grade 5 Elementary School Students Ramjard city, the first national conference of educational sciences and psychology, Marvdasht. <https://psycnet.apa.org/record/1992-97624-042>. [Link]
- Giacomazzi, M., Fontana, M., & Camilli Trujillo, C. (2022). Contextualization of critical thinking in sub-Saharan Africa: A systematic integrative review. *Thinking Skills and Creativity*,

- 43(October 2020).
<https://doi.org/10.1016/j.tsc.2021.100978>. [link]
- Gregory, G. H., & Chapman, C. (2013). Differentiated instructional strategies: One size doesn't fit all. Corwin press.
- Hemmati Maslak Pak, M., Orujlu, S., & Khalkhali, H. R. (2013). The effect of problembased learning on nursing students critical thinking skills. *Journal of Medical Development and Education*, 9(1), 24-33. magiran.com/p1284282.
<https://psycnet.apa.org/record/1992-97624-042>. [Link]
- Islami, Mohsen. (2003). Providing a model for designing and implementing a critical reading program Its effect on critical thinking and analytical writing of Tehran teacher training course students. Unpublished Thesis: Tehran University.
- Jones, T. (2017). Playing Detective to Enhance Critical Thinking. *Teaching and Learning in Nursing*, 12(1), 73-76.
<https://doi.org/10.1016/j.teln.2016.09.005>. [Link]
- Khalili, H., & Hosseinzadeh, M. (2003). Investigation of reliability, validity and normality Persian version of the California Critical Thinking Skills Test; Form B (CCTST). *Journal of Medical Education*, 3(1), e105016.
<https://doi.org/10.22037/jme.v3i1.871> [Link]
- Loraki, N., & Parsapour, A. (2017). The Impact of Problem-Based Education on Students Critical Thinking. First National Conference on Modern Applied Research in Basic Sciences, Bandar Abbas.
<https://psycnet.apa.org/record/1992-97624-042>. [Link]
- Mehrinejad, S. A. (2007). Adaptation and standardization of the California Test of Critical Thinking Skills. *Cognitive Science News*, 9(3 (series 35)), 63-72.
<https://sid.ir/paper/82760/fa>. [Link]
- Meyer, M. H., & Abdul-Malak, Y. (2015). Single-Headed Family Economic Vulnerability and Reliance on Social Programs. *Public Policy & Aging Report*, 25(3), 102-106.
<https://doi.org/10.1093/ppar/prv013>. [Link]
- Molanorie, F. (2017). Comparison of Critical Thinking from the View of Ennis with Professor Motahari. Unpublished Thesis, Al-Zahra University. (in Persian)
- Mootabi, F., Fata, L., Kazem Zade, M., & Mohammad khani, SH. (2006). A practical guide to holding life skills training workshops. Tehran: Danjeh Press.
- Naderi, M., Safari, A., & Qashlaghi, Sh. (2021). The effect of Teriz problem solving skill training on students' creative and critical thinking. *Journal of research in humanities education of Farhangian University*, number 22.
<https://dorl.net/dor/20.1001.1.27172260.1400.7.22.6.4>. [Link]
- Pusparini, S. T., Feronika, T., & Bahriah, E. S. (2018). Pengaruh Model Pembelajaran Problem Based Learning (PBL) Terhadap Kemampuan Berpikir Kritis Siswa pada Materi Sistem Koloid. *JRPK: Jurnal Riset Pendidikan Kimia*, 8(1), 35-42.

- <https://doi.org/10.21009/JRPK.081.04>. [Link]
- Prayogi, S., Muhali, M., Yuliyanti, S., Asy'ari, M., Azmi, I., & Verawati, N. (2019). The effect of anomaly data presentation on increasing students' critical thinking ability. *International Journal of Emerging Technologies in Learning (IJET)*, 14(06), 133. <https://doi.org/10.3991/ijet.v14i06.9717>. [Link]
- Rouijel, E. H., Bouziane, A., & Zohri, A. (2019). The Effect of Explicit Instruction in Critical Thinking on Higher-Order Thinking Skills in Reading Comprehension: an Experimental Study. *European Journal of English Language Teaching*, 5(1), 114-126. <https://doi.org/10.5281/zenodo.3382955>. [Link]
- Saiful, A. M. I. N., Utaya, S., Bachri, S., Sumarmi, S., & Susilo, S. (2020). Effect of problem based learning on critical thinking skill and enviromentalattitude. *Journal for the Education of Gifted Young Scientists*, 8(2), 743-755. <https://doi.org/10.17478/jegys.650344>. [Link]
- Saputri, D. I., Sunarno, W., & Supriyanto, A. (2020, June). Measurement of critical thinking in physics: the identification of students' critical thinking skill through the work report on momentum conservation?. *In Journal of Physics: Conference Series* (Vol. 1567, No. 3, p. 032073). <https://ui.adsabs.harvard.edu/abs/2020JPhCS1567c2073S/abstract>. [Link]
- Sheivandi Cheliche, K., Hassanvand, F., Gelami, Z., & Nefer, Z. (2023). Investigating the effectiveness of teaching life skills (problem solving and decision-making) on interpersonal intelligence, love of learning and self-control in male students. *Sociology of Education*, 8(2), 57-66. <https://psycnet.apa.org/record/1992-97624-042>. [Link]
- Uzunöz, F. S., & Demirhan, G. (2017). The effect of creative drama on critical thinking in preservice physical education teachers. *Thinking Skills and Creativity*, 24, 164-174. <https://doi.org/10.1016/j.tsc.2017.02.018>. [Link]
- Wahyudi, W., Verawati, N. N. S. P., Ayub, S., & Prayogi, S. (2019). The effect of scientific creativity in inquiry learning on increasing critical thinking ability of prospective teachers. *Jurnal Internasional Teknologi Berkembang dalam Pembelajaran (IJET)*, 14(14), 122. <https://online-journals.org/index.php/ijet/article/view/9532>. [Link]

