Original Article

The effectiveness of schema therapy and positive psychotherapy training based on resilience on problem-solving skills and ambiguity tolerance in technical-vocational students

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Abstract

Background: Psychotherapeutic interventions can be effective in increasing students' problem-solving skills and tolerance for ambiguity. This research aimed to compare the efficacy of schema therapy and positive psychotherapy training based on resilience on problem-solving skills and ambiguity tolerance in technical-vocational students.

Methods: This semi-experimental study was conducted on girl high school sophomores referred to educational counseling centers in District 6 of Mashhad during the second semester of the academic year 2023-2024. A total of 45 participants were randomly selected and assigned to three groups of 15 people (two experimental and one control). The first experimental group received schema therapy; the second experimental group underwent resilience-based positive psychotherapy training, while the control group received no therapeutic intervention. The Peterson's Problem-Solving Inventory (PSI) and McLain Ambiguity Tolerance Scale–I (MSTAT-II) were used. The data were analyzed using SPSS software (version 24) through analysis of covariance.

Results: The results indicated that both schema therapy and resilience-based positive psychotherapy interventions have statistically significant effects on improving problem-solving skills and tolerance for ambiguity among technical-vocational students ($P < 0.05$). However, comparisons revealed no significant difference in efficacy between two therapeutic approaches for either outcome measure ($P > 0.05$).

Conclusion: According to the findings, both schema therapy methods and positive psychotherapy training based on resilience represent effective interventions for enhancing problem-solving abilities and ambiguity tolerance among technical-vocational students.

Keywords: Ambiguity tolerance; Psychotherapy; Problem solving; Schema therapy; Students.

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Introduction

Adolescence represents a critical developmental period in human growth, serving as a foundational stage for personality formation and psychological development. This period is accompanied by numerous psychological and physical changes, such as finding identity, distancing oneself from society,

increasing the role of peers, a desire for independence, idealism, sexual identity, orientation to the opposite gender, and a tendency to risky behaviors (1). At this stage, adolescents face doubts and challenges that can have profound effects on their growth path and future (2). In this regard, empowering adolescents in solving problems leads to increased motivation to deal with problems and strengthening their sense of self-confidence. Problem solving, as a coping and practical skill, is directly related to increasing adolescents' self-confidence and efficiency, and is closely linked to their environmental adaptation (1). This basic skill is essential in dealing with everyday problems. In the process of problem solving, an opportunity is provided for individuals to discover, create, or identify effective ways to deal with life's challenges. Actually, problem-solving skills are a process that helps adolescents develop and effectively increases their ability to deal with different situations (3). Given the importance of adolescence for students, empowering them to solve problems and issues seems essential. Possible problems during this period can have widespread effects on students' academic, social, and family performance. Therefore, it is not only necessary to survey the components and factors affecting problem-solving skills, but also to examine other components affecting students' academic performance, including ambiguity tolerance.

Ambiguity tolerance represents a multidimensional personality construct that characterizes an individual's tendency to perceive, process, and respond to uncertain, complex, or ambiguous situations through characteristic cognitive appraisals, emotional reactions, and behavioral tendencies (4). Ambiguity tolerance is a variable that affects adaptation and coming to terms with oneself, the environment, and others, and on aspects of cognitive and emotional performance and students' belief systems. It also contributes significantly to their interpersonal, social, and problem-solving behaviors. People with lower ambiguity tolerance usually experience more stress and, due to weakness in decision-making and self-doubt, have difficulty developing positive personality traits such as problem-solving skills to cope with psychological stress by avoiding ambiguous situations (5). In this regard, evaluating the effectiveness of effective therapies in increasing students' psychological capacities, including problem-solving skills and ambiguity tolerance, is of particular importance. Empowerment in problem solving enhances self-confidence and creativity among students, especially technical-vocational students (6). Strengthening students' individual and psychological skills in solving problems and tolerating ambiguity is of particular importance, which can be improved by relying on existing psychological therapies (7). Adolescents, due to their specific developmental period, are forced to face many transitional events such as physical, academic, and social changes, and must find problem-solving skills to solve problems and deal with upcoming issues. These individuals also have a low tolerance for distress. Considering the extensive impact that possible problems during this period can have on students' academic, social, and family performance, it is important not only to examine effective treatments for it but also to help prevent problems in students (8). Research has shown that new psychological therapies known as positive psychology are effective in enhancing problem-solving skills and ambiguity tolerance (9). Therefore, appropriate group interventions and training can be used to help students with weak skills strengthen their positive psychological constructs (10). These therapies include schema therapy and positive psychotherapy training based on resilience.

Schema therapy is an approach that examines past attitudes and beliefs and their impact on an individual’s current

relationships. One of the interventions that has been effective in increasing empowerment and problem-solving skills is schema therapy (11). Young believes that a schema is a stable, long-term pattern that is formed in childhood and continues into adulthood. Schemas are important beliefs and feelings about themselves and the environment that individuals have accepted without question and that show great resistance to change. These schemas usually do not change anywhere else except in the context of therapy (12). Schema Therapy, originally developed by Young and colleagues (1990-1999), represents an integrative therapeutic approach that synthesizes core principles from cognitive-behavioral therapy with elements of attachment theory, object relations, Gestalt therapy, constructivism, and psychoanalytic concepts (13). Clinical experiences show that patients with severe personality disorders, as well as people with significant cognitive character problems, such as those that form the basis of their Axis I disorders, respond very well to schema therapy (14).

Positive psychotherapy is also based on several underlying theories, including the theory of abilities, the theory of creating and expanding positive emotions, and the growth theory (15). Research shows that positive psychotherapy training based on resilience is effective on problem-solving skills (16). Positive Psychotherapy represents a strengths-based clinical intervention grounded in positive psychology principles. The basic assumption of positive psychotherapy in the treatment of pathology is, in addition to reducing symptoms and signs, to identify the client's positive resources such as positive emotions, capabilities, and meaning. An individual’s inherent positive resources serve as vital psychological assets not only during periods of flourishing but also when facing adversity and empower individuals to navigate challenges effectively while maintaining well-being (8). In general, positive psychotherapy seeks to balance the individual's attention so that when the brain inherently notices and focuses on injustices, insults, pride, and hatred, the client learns to voluntarily elicit experiences related to kindness, forgiveness, encouragement, humanity, and companionship (17).

Given that problem-solving skills and ambiguity tolerance in students are considered one of the fundamental variables for the success of students in technical-vocational fields. On the other hand, studies have shown that so far no research has examined and compared the effectiveness of schema therapy and positive psychotherapy training based on resilience on problem-solving skills and ambiguity tolerance in students in technical-vocational fields. The present study was done with the aim of comparing the effectiveness of schema therapy and positive psychotherapy training based on resilience on problem-solving skills and ambiguity tolerance among technical-vocational students in Mashhad.

Methods

The present study is a quasi-experimental study with a pre-test and post-test design with experimental and control groups. The study population comprised all female second-year technical-vocational high school students in District 6 of Mashhad during the 2023-2024 academic year's second semester who were referred to the Educational Counseling Center for academic underachievement (with grade point averages between 10 and 15). According to the statistics of the relevant expert in the secondary school, the number of students was 83. Of these, 60 participants met the inclusion criteria, which 45 subsequently selected through random sampling for study participation. The people were randomly allocated (or using a random number table) into three groups: a schema therapy experimental group, a positive psychotherapy intervention group focusing on resilience training, and a control group, with 15 participants in each

condition. Here, all individuals had equal conditions for being placed in each group.

Inclusion criteria comprised: voluntary participation consent, age range of 16-18 years, no acute medical conditions, and no current therapeutic interventions. Exclusion criteria also involved: participant withdrawal and missing more than two sessions.

It should be noted that ethical compliance was maintained throughout all study phases. Prior to obtaining informed consent, participants received complete disclosure regarding research objectives and were guaranteed strict confidentiality of all data for research purposes only. The individuals were guaranteed strict confidentiality and completed all questionnaires under anonymous, coded conditions in a controlled environment designed to ensure psychological comfort throughout the data collection process. Participants retained the unconditional right to withdraw from the study at any stage without penalty or consequence should they experience any discomfort or personal concerns.

The first experimental group received a 12-session schema therapy intervention, with each 90-minute session following Young's standardized treatment protocol (12) and The second experimental group underwent a 12-session positive psychotherapy program (90 minutes per session) grounded in resilience principles, implemented in accordance with Rashid and Seligman's (2014) evidence-based protocol (17). During the intervention period, the control group was placed on a waiting list and did not receive training. Finally, a standardized post-test was administered concurrently to all three groups (both experimental and control conditions) under identical testing conditions. In this study, Heppner and Peterson's Problem-Solving Inventory (PSI) and McLain Ambiguity Tolerance Scale–I (MSTAT-II): were used to collect data.

Problem-Solving Inventory (PSI): This questionnaire was developed by Heppner and Peterson (1982) to measure respondents' understanding of problem-solving behaviors. It has 35 items on a 6-point Likert scale from 1 (strongly agree) to 6 (strongly disagree). The PSI comprises three primary subscales: Problem-Solving Confidence (11 items), attitude Style (16 items), and Personal Control (5 items), along with 3 additional items not belonging to these subscales. This inventory has relatively high internal consistency with alpha values between 0.72 and 0.85 for the subscales problem-solving confidence 0.72, attitude style 0.85, and personal control 0.90 for the total scale (18). Its validity showed that the instrument measures constructs that are related to personality variables and are significantly related to locus of control. Chaji et al. (2022) established strong test-retest reliability for the PSI total score from 0.83 to 0.89 across a two-week period, demonstrating excellent temporal stability for assessing problem-solving capacity (19). Mahzoonzadeh Bushehri's research established strong internal consistency for the questionnaire, with Cronbach's alpha coefficient reaching 0.86, indicating excellent scale reliability(20). In the present study, Cronbach's alpha was obtained 0.83.

McLain Ambiguity Tolerance Scale–I (MSTAT-II): The standard ambiguity tolerance questionnaire has 13 questions, which was developed by McLean (1993). Items are scored on a 5-point Likert scale ranging from 1 ('strongly disagree') to 5 ('strongly agree'). A score between 15 and 30 indicates low ambiguity tolerance, 30 to 45 moderate, and a score above 45 high. McLain (21) established strong psychometric properties for this scale, demonstrating excellent internal consistency ($\alpha = 0.86$) and good test-retest reliability ($r = 0.79$-0.82) across administrations. Salmani et al. established strong psychometric properties for the Persian adaptation, demonstrating excellent internal consistency ($\alpha = 0.82$) and

acceptable split-half reliability (r = 0.78) (22). In this study, Cronbach's alpha was 0.82.

Intervention Programs

The schema therapy intervention, following Young et al.'s (2003) treatment protocol, was implemented across twelve sessions as detailed in Table 1. Intervention sessions for positive psychotherapy training based on resilience according to the Rashid and Seligman (2014) approach are also summarized in Table 2.

Data analysis was performed using IBM SPSS Statistics (Version 24).Continuous variables are reported as mean ± standard deviation, while categorical variables are presented as frequency (percentage).The normality of data distribution was verified using both the Kolmogorov-Smirnov and Shapiro-Wilk tests.

Table 1**.** The schema therapy intervention, following Young et al.'s treatment protocol

Sessions	**Content**
First	The group formation protocol included: participant selection, pre-group individual counseling sessions, emphasizing attendance requirements, orientation to group therapy methods, and scheduling consensus building among members.
Second	participant introductions and rapport-building, establishment of group norms with emphasis on confidentiality, clarification of therapeutic goals, psychoeducation regarding schema therapy fundamentals, and administering short forms of questionnaires as homework for the next meeting.
Third	Reviewing the questionnaires that were administered; assessing the schema through mental imagery; identification and activation of maladaptive schemas, imagery rescripting with significant attachment figures (parents, peers, and other formative relationships), and facilitated emotional processing of schema-related affect.
Fourth	Psychoeducation regarding maladaptive coping styles (surrender, avoidance, overcompensation), identification and analysis of these patterns in selected group members, and illustration case examples demonstrating each coping style's manifestations.
Fifth	Testing the validity of schemas; (a) gathering empirical evidence supporting the schema's validity, (b) collecting contradictory evidence challenging the schema's accuracy, and (c) collaboratively developing a more balanced, evidence-based schema formulation.
Sixth	Assessing the effectiveness of members' coping strategies; designing and producing schema therapy flashcards; and presenting and completing the schema registration forms.
Seventh	Reviewing the schema registration form and educational cards, applying the 'Healthy Aspect vs. Schema Aspect' dialogue technique.
Eighth	a. Visualizing childhood experiences; connecting past mental imagery to present emotions and behaviors; framing these perceptions within a schema-based model; b. Employing mental imagery techniques to explore and restructure cognitive patterns.
Ninth	Facilitating an imaginary dialogue with parents during the session using the empty chair technique; Employing mental imagery exercises to disrupt maladaptive patterns; Assigning a therapeutic letter-writing task (addressed to parents) as homework.
Tenth	Reviewing completed homework; Re-evaluating members' understanding and conceptualization; Exploring in depth the dynamics of social exclusion; Pinpointing specific maladaptive behaviors as potential focus areas for intervention.
Eleventh	Enhancing motivation for changing maladaptive behaviors to their childhood origins; Reviewing the advantages and disadvantages of continuing the behavior; Practicing healthy behaviors through mental imagery and role-playing; Summarizing and getting feedback.
Twelfth	Summarizing and reviewing the sessions, answering the subjects' questions, and administering the post-test.

To evaluate the comparative effectiveness of schema therapy versus positive psychotherapy training on students' resilience, problem-solving skills, and ambiguity tolerance, we employed analysis of covariance (ANCOVA). Post-hoc analyses with Bonferroni were conducted to examine specific between-group differences.

Results

In this study, the mean age of the subjects in the first experimental group was 16.21 ± 4.24 years, the first experimental group was 16.29 ± 4.24 years, and the control group was 16.07 ± 3.21 years. In addition, the Min and Max ages of the subjects were 16 and 18 years, respectively. Among the participants in the first experimental group, 5 (33.33%) had tenth grade education, 6 (40%) eleventh grade, and 4 (26.66%) twelfth grade.

Table 2. Content of Resilience-Based Positive Psychotherapy Sessions

Sessions	Session Content	Description
First	Orientation	Lack of positive resources perpetuates depression: Discuss the role of the absence or lack of positive emotions, character strengths, and meaning in perpetuating depression and the emptiness of life.
Second	Pleasure	Clients identify their own specific strengths from a positive perspective and discuss situations in which these specific strengths have helped them in the past.
Third	Pleasure /Commitment	Developing Specific Competencies and Positive Emotions: discussing the development of specific competencies. Preparing clients to shape specific, goals, and reachable behaviors to develop specific competencies. Discussing the role of positive emotions in well-being.
Fourth	Pleasure	Good versus bad memories: discussing the role of positive and negative memories in terms of their role in maintaining depressive symptoms. Guiding clients to openly acknowledge and process emotions like anger and bitterness, which may contribute to their distress. Exploring the psychological and emotional consequences of holding onto these negative emotional states, highlighting their impact on depression severity and overall well-being.
Fifth	Pleasure /Commitment	Forgiveness: it is presented as a profound psychological tool capable of converting anger and bitterness into emotional neutrality—and for many individuals, even into genuine positivity.
Sixth	Pleasure /Commitment	Gratitude: This section explores the enduring practice of gratitude and revisits the interplay between positive and negative memories—now through the lens of appreciation.
Seventh	Meaning /Commitment	Satisfaction vs. Maximization: This section examines the tension between satisfaction (accepting "good enough") and maximization (pursuing the absolute best) within the context of pleasure and effort.
Eighth	Pleasure	Optimism and Hope: Clients are guided to reflect on past experiences of failure, unmet goals, or rejection—not to dwell on loss, but to discover new possibilities. By exploring moments when "one door closed," they practice identifying unexpected opportunities, pathways, or personal growth that emerged as a result.
Ninth	Commitment/ Meaning	Love and affection: Actively respond, creating discussion. This exercise invites clients to actively recognize the unique strengths, talents, and qualities of the people who matter most to them.
Tenth	Meaning	Genealogy of abilities: This exercise guides clients in identifying and appreciating the unique talents, skills, and strengths that run through their family lineage.
Eleventh	Meaning	The Gift of Time: This section guides appreciative clients to recognize that their presence, attention, and effort are among the most valuable gifts they can give.
Twelfth	Coherence	Full Life: The concept of a full life that integrates pleasure, commitment, and meaning is discussed. Clients completed tests before the end of the session.

Table 3. Means of problem-solving and ambiguity tolerance scores in the three research groups

Variable	Stage	schema therapy	Positive psychotherapy training based on resilience	Control
		Mean ± SD	Mean ± SD	Mean ± SD
Problem-solving confidence	Pre-test	34.87 ± 6.74	35.27 ± 6.28	34.33 ± 7.9
	Post-test	45.27 ± 7.49	41.2 ± 7.54	34.47 ± 6.73
Attitude style	Pre-test	43.27 ± 12.81	45.67 ± 7.9	41.67 ± 10.57
	Post-test	50.4 ± 11.33	57.93 ± 6.08	44.47 ± 11.14
Personal control	Pre-test	15.53 ± 3.02	15.87 ± 2.35	15.13 ± 3.64
	Post-test	21.27 ± 4.07	19.87 ± 2.92	15.2 ± 3.48
Problem-solving skills	Pre-test	93.67 ± 16.29	96.8 ± 10.31	91.13 ± 12.14
	Post-test	121.93 ± 15.65	119 ± 12.42	94.13 ± 15.54
Ambiguity tolerance	Pre-test	30.73 ± 6.34	29.67 ± 7.22	29.87 ± 7.72
	Post-test	40.87 ± 5.55	35.4 ± 5.52	28.73 ± 7.94

Among the second experimental group, 6 (40%) had tenth grade education, 5 (33.33%) eleventh grade, and 4 (26.66%) twelfth grade. Among the control group, 5 (33.33%) had tenth grade education, 6 (40%) eleventh grade, and 4 (26.66%) twelfth grade.

Table 3 indicates the mean of problem-solving and ambiguity tolerance scores for students in different groups and stages of assessment. As shown, both experimental groups demonstrated greater increases in problem-solving and ambiguity tolerance scores from pre-test to post-test compared to the control group.

The Kolmogorov-Smirnov test assessed the normality of the variables. The results indicated a normal distribution for both problem-solving skills ($Z = 0.87$, $p > 0.05$) and ambiguity tolerance ($Z = 0.71$, $p > 0.05$). Additionally, the Shapiro-Wilk test (Table 4) confirmed that the null hypothesis of normality could not be rejected for either variable.

To evaluate the effectiveness of schema therapy and resilience-based positive psychotherapy training on students' problem-solving skills and ambiguity tolerance, an analysis of covariance (ANCOVA) was conducted. As presented in Table 5, a statistically significant difference was observed in problem-solving skills among the schema therapy group, resilience-based positive psychotherapy group, and the control group ($F = 6.15$, $p = 0.005$).

Table 4**.** The results of Shapiro-Wilk test

Group	Test	Problem-solving skills	Ambiguity tolerance
Experimental 1	Z	0.944	0.978
	P-value	0.434	0.953
Experimental 2	Z	0.923	0.987
	P-value	0.216	0.997
Control	Z	0.948	0.963
	P-value	0.493	0.736

Table 5. Results of univariate analysis of covariance on the scores of study variables

Variable	Source	SS	df	MS	F	P-value	Etta Coefficient
Problem-solving skills	Group	2271.160	2	1135.580	6.15	0.005	0.23
	Error	6.549	1	6.549			
Ambiguity tolerance	Group	636.356	2	318.178	6.39	0.004	0.23
	Error	2038.956	41	49.731			

Similarly, a significant difference was found in ambiguity tolerance across the three groups (F = 6.39, p = 0.004). These results indicate that at least one of the therapeutic interventions had a significant effect on the dependent variables.

In order to show the observed difference between the groups, the Bonferroni post hoc test was performed (Table 6). The results revealed significant improvements in problem-solving skills for both intervention groups compared to the control group. Specifically: Schema therapy demonstrated a significant effect on problem-solving skills relative to the control group (mean difference = 15.12, p = 0.01). Resilience-based positive psychotherapy also showed a significant effect compared to the control (mean difference = 15.36, p = 0.012). However, no significant difference was found between the two therapy groups themselves (mean difference = 0.239, p = 0.99), indicating comparable efficacy in enhancing problem-solving skills.

Also, the results revealed significant effects on ambiguity tolerance for both interventions compared to the control group (Table 6). Schema therapy significantly improved ambiguity tolerance relative to controls (mean difference = 8.27, p = 0.003). Resilience-based positive psychotherapy also demonstrated significant improvement compared to controls (mean difference = 7.64, p = 0.005). However, no significant difference was observed between the two intervention groups (mean difference = 0.63, p = 0.98), indicating equivalent effectiveness in enhancing ambiguity tolerance.

Discussion

This study examined the comparative efficacy of schema therapy versus resilience-based positive psychotherapy in enhancing problem-solving skills among technical-vocational students. The findings demonstrated that both therapeutic interventions significantly improved problem-solving abilities relative to the control group. However, post hoc analyses revealed no statistically significant difference in effectiveness between the two treatment modalities, suggesting comparable outcomes for both approaches.

Table 6. Bonferroni post hoc results for comparing differences in variables across research groups

Variable	**Comparison group**	**Mean difference**	**S.E.**	**P-value**
Problem-solving skills	Schema therapy- Control	15.12	4.97	0.01
	Positive psychotherapy training based on resilience	15.36	5.04	0.012
	Schema therapy- Positive psychotherapy training based on resilience	0.239	4.98	0.99
Ambiguity tolerance	Schema therapy- Control	8.27	2.57	0.003
	Positive psychotherapy training based on resilience- Control	7.64	2.57	0.005
	Schema therapy- Positive psychotherapy training based on resilience	0.63	2.58	0.98

This finding is accordance with the results of Abbady (23) and Virgil et al. studies (24). They showed that schema therapy improves the level of problem-solving skills in students. In his research, Abbady (23) aimed to examine the effectiveness of emotional schema therapy (EST) on students who experienced difficulties in emotion regulation and neurotic perfectionism. Results showed that emotional schema therapy was effective in improving emotion regulation at post-test and follow-up in the experimental group. In addition, participants showed a significant reduction in neurotic perfectionism at post-test and follow-up. In order to explain this finding and the consistent findings, it can be said that schema therapy helps clients to gain more confidence in their problem-solving abilities and to adopt more adaptive behaviors by replacing ineffective coping responses with more adaptive and new behavioral patterns. Accordingly, it can be expected that schema therapy was effective in continuing to improve problem-solving skills. During the schema therapy process, individuals develop healthier beliefs by identifying negative schemas, improving problem-solving skills, and consolidating positive emotional schemas. This increases acceptance of emotions, understanding others, promoting higher values, and greater agreement with the environment. For this reason, they can effectively deal with misconceptions about their expectations when facing problems in the rest of their lives.

Positive psychotherapy also includes several underlying theories, including the theory of abilities and the theory of the construction and development of positive emotions (15). The theory of abilities emphasizes that in addition to paying attention to weaknesses, attention should also be paid to human capabilities. The theory of the construction and development of positive emotions also focuses on the fact that after creating positive emotions, this emotion continues not only in happy moments, but also in the long term (25). Therefore, during the sessions, individuals learn to increase their resilience and prepare for confrontation when faced with stressful events instead of avoiding effort and activity, and sometimes they do this by receiving better environmental support (26). It can also be said that the mission of each of these psychological therapies is to improve individual performance in the individual, family, and social domains. The therapies used in this study, relying on psychological approaches, have helped to continuously improve problem-solving skills in the research subjects. Schema-based intervention, relying on the cognitive schemas in the memory of individuals, encourages and requires them to identify schemas, because every problem belongs to a specific schema before it can be solved. When different information is grouped and conceptualized in a single schema, the load on working memory is reduced and the possibility of solving the problem in a more efficient and effective manner is provided. Accordingly, it can be said that the use of experiential techniques is one of the key features of schema therapy, which shows that language-based cognitive-rational systems are independent of emotion-related systems.

In this study, the results indicated that schema therapy significantly improved problem-solving skills in the experimental group compared to control. This finding confirmed the results of Abbady (23) and Moradian et al. (27). In explaining this finding, it can be said that personal problems and anxiety put a lot of pressure on students, and the relationship between anxiety and uncertainty and the use of ineffective strategies to reduce it requires changing attitudes, emotions, and behaviors related to uncertainty. Schema therapy, using the main strategies of this model namely cognitive, experiential, and behavioral, challenging early maladaptive

schemas that are the main source of irrational beliefs and thoughts, as well as experiential strategies such as mental imagery, which is of great importance in adolescents, helps individuals achieve better rational understanding through emotional understanding of schemas (28). Also, students who believe in failure and inability to achieve academic success feel more incompetent and experience less success compared to their peers. The activation of the shame/deficiency schema from the area of exclusion and rejection intensifies students' sensitivity to unmet needs such as security, affection, empathy, and acceptance (29).

The results of the present study revealed that resilience-based positive psychotherapy significantly enhanced problem-solving skills in the experimental group. This result is consistent with the studies of Plummer and Cross (30) and Nolet (31). In it explaining, it should be noted that positive psychotherapy focuses on the positive characteristics, capabilities, and virtues of the individual. Awareness of positive individual capabilities leads to increased cognitive flexibility in two dimensions; greater control over stressful situations and the ability to find effective problem-solving strategies. In this approach, students with academic failure were taught to rely on their positive emotions and capabilities; emotions and capabilities that had previously been ignored. By focusing on these virtues, the therapist enhances their resilience and flexibility. On the one hand, the individual is encouraged to avoid negative emotions by focusing more on the positive emotions in life, and on the other hand, his coping capacity to neutralize and reduce negative emotions is also increased.

The study found no statistically significant difference between schema therapy and resilience-based positive psychotherapy in enhancing ambiguity tolerance, which confirms the findings of Gogineni study (26). In this regard, we can point out the effects of these two therapeutic approaches on improving ambiguity tolerance and dealing with personal problems and decision-making in different life situations. Research has shown that when people have low ambiguity tolerance, they are less involved in solving problems (32). For this reason, students' participation in the treatment process that is carried out to improve their performance and ambiguity tolerance has beneficial effects on their psychological state. This improvement in health and psychological state certainly affects the way they deal with upcoming problems and subsequently has positive consequences for their academic performance. In the present study, this issue was reflected in the fact that students who participated in schema therapy sessions and positive psychotherapy training based on resilience reduced their stress and helplessness in facing life issues and their decision-making power. This made these students feel that they had a better psychological situation and could better control emotional reactions in relation to upcoming ambiguities in the personal, social, family and academic areas. During positive psychotherapy training based on resilience and schema therapy, students' anxiety levels decreased and their communication, resilience and sense of independence increased, thereby developing their ambiguity tolerance (33, 34). Accordingly, the effect of schema therapy on ambiguity tolerance provides an opportunity for individuals to stop negative evaluation and avoidance and instead use normal and adaptive coping strategies. The use of adaptive coping strategies can also lead to improving the psychological capacity and problem-solving power of individuals, and this process improves their ambiguity tolerance (26). Regarding the effects of positive psychotherapy training based on resilience, it can also be said that positive intervention, because it addresses psychological mechanisms such as flexibility and problem solving, makes the individual resilient to life's difficulties over

time. Positive interventions can arrange the individual's mind to choose suitable and creative techniques to advance objectives and solve difficulties. Thus, it can be said that people who participated in a course of positive psychotherapy can enhance their ambiguity tolerance by increasing problem-solving skills, self-awareness, improving meaning and purpose in life, and promoting adaptability and inner peace through their resilience (29).

The following are some of the limitations of the study: The sample was selected only from female students in one district of Mashhad, which could reduce the external validity of the study. Some confounding factors such as intelligence and personality traits that could affect the results were not considered, moreover the lack of attention to some psychological variables such as the expectations of the clients, the psychological mindset and insight of the clients, the clients' motivation, the strains that accompany the research and economic conditions. Individual responses to instruments may also create bias, which must be taken into account when generalizing results. The study relies on the Problem-Solving Inventory (PSI) and McLain Ambiguity Tolerance Scale–I (MSTAT-II). These are self-report measures, which are susceptible to biases such as social desirability bias or response bias. The study only assesses the effects of the interventions immediately after the 12-session programs. Without a follow-up assessment, it is impossible to determine whether the observed improvements are maintained over time. It is recommended that this research be conducted for studies with larger and more diverse samples, longitudinal designs, or research into moderators and mediators of intervention effects.

Conclusion

The results revealed that both interventions, namely schema therapy and positive psychotherapy training based on resilience, led to the improvement of problem-solving skills and ambiguity tolerance. The results also indicated that there was no significant difference between the effectiveness of the two in the context. Therefore, it can be concluded that to improve the level of problem-solving skills and ambiguity tolerance in technical-vocational students, both methods of schema therapy and positive psychotherapy training based on resilience can be used, and both methods can be helpful in this regard.

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Authors' contribution

Mahmoudi A and Keshavarz A developed the study concept and design. Mahmoudi A acquired the data. Haghayegh SA and Khorvash M analyzed and interpreted the data, and wrote the first draft of the manuscript. All authors contributed to the intellectual content, manuscript editing and read and approved the final manuscript.

Ethical considerations

Questionnaires were filled with the participants' satisfaction and written consent was obtained from the participants in this study

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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