

RESEARCH ARTICLE

The Relationship Between Self-Compassion and Self-Efficacy with the Mediating Role of Metacognition in Middle-Aged Single Women

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ABSTRACT

Middle-aged single women, as a growing demographic group, face unique psychological and social challenges. Identifying factors that influence psychological well-being and effectiveness in this population is therefore essential. The aim of the present study was to examine the relationship between self-compassion and self-efficacy, with metacognition as a mediating variable, in single women aged 40 to 65 years. This study employed a descriptive–correlational design within the framework of developmental research. Data were collected in 2025 from 225 middle-aged single women residing in Tehran using convenience sampling. The instruments included the Self-Compassion Scale, the General Self-Efficacy Scale, and the Metacognitions Questionnaire. Data analysis was conducted using structural equation modeling with SPSS version 26 and LISREL version 8. After confirming the measurement model, structural modeling was used to examine the direct and indirect relationships among the variables. The findings indicated that self-compassion was positively and significantly related to both metacognition and self-efficacy. In addition, metacognition significantly predicted self-efficacy, and its mediating role in the relationship between self-compassion and self-efficacy was confirmed ($p < 0.01$). Self-compassion may contribute to enhanced resilience and a greater sense of competence—and, consequently, higher self-efficacy—by improving mindfulness as a component of metacognition. The results underscore the importance of cognitive and personality factors, particularly metacognition and self-compassion, in the design of psychological interventions to enhance self-efficacy among middle-aged single women.

Introduction

Midlife is a period typically defined as the years between 40 and 65 and is characterized by substantial changes across the physical, psychological, and social domains (Lachman, 2004). During this stage, some individuals may re-evaluate their achievements and life goals, leading to an experience commonly referred to as the “midlife crisis” (Freund & Ritter, 2009). It is often assumed that in adulthood, individuals are largely stabilized in their social roles and that this stage is relatively unproblematic. Therefore, one of the implicit aims of the present study is to highlight that midlife is also associated with unique challenges. Like other stages of life, midlife involves cognitive and personality changes, as well as transformations in relationships, emotions, and physical health. This period also encompasses important aspects such as achieving a balance between work and personal life and rediscovering the self (Das & Chakraborty, 2024).

According to the 2016 National Population and Housing Census of the Islamic Republic of Iran, individuals aged 45–64 constituted approximately 15.8% of the country’s total population. Considering recent demographic trends and population changes, and based on the demographic report published in 2024 by the Office of Population, Labor Force, and Household Economics of the National Statistical Center of Iran, among the total population of 85.9 million in 2024, the highest population density for both women and men was reported in the age range of 35–39 years (Statistical Center of Iran, 2024). These statistics indicate that the population is gradually moving toward aging and midlife, a trend clearly reflected in demographic data and reports. Accordingly, examining the issues and challenges of midlife is of considerable importance.

Self-compassion is a positive, supportive attitude toward oneself when facing pain and failure. This construct consists of three main components: self-kindness (rather than self-judgment), common humanity (rather than isolation), and mindfulness (rather than over-

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identification). Self-kindness refers to being warm and understanding toward oneself in the face of suffering or failure, rather than adopting a harsh, self-critical stance based on judgment. Common humanity involves perceiving one's experiences as part of the broader human condition, thereby fostering a sense of connection with others rather than isolation, alienation, and suffering. Mindfulness refers to holding painful thoughts and emotions in balanced awareness. In contrast, over-identification causes individuals to become excessively immersed in their emotions, leaving less mental space for cultivating self-compassion. In other words, self-compassion represents a dynamic system in which different elements interact to reduce individual suffering (Neff, 2003; Germer & Neff, 2013; Neff et al., 2014).

Metacognition is a higher-order cognitive structure that involves individuals' awareness of their own mental activities and processes, as well as their ability to intentionally regulate and direct them (Capobianco et al., 2018). Metacognition consists of two primary components: cognitive knowledge and cognitive regulation. Flavell defined cognitive knowledge as knowledge about one's cognitive strengths and limitations, including both internal and external factors that may influence cognition. Metacognitive experiences involve the application of metacognitive strategies or metacognitive regulation (Flavell, 1979). Metacognitive strategies are sequential processes individuals use to control their cognitive activities and ensure the achievement of a cognitive goal (e.g., understanding a text). These processes help regulate and monitor learning, including planning, monitoring cognitive activities, and evaluating their outcomes (Lai, 2011).

Self-efficacy refers to individuals' perceptions of their capabilities to perform tasks in specific situations and can influence behaviors such as activity selection, effort, and persistence when facing difficulties. Bandura stated that self-efficacy beliefs function as determinants of human motivation, affect, and action. These beliefs influence behavior through motivational, cognitive, and affective mediating processes. For example, in the cognitive process, personal goal setting is essential. The higher the perceived level of self-efficacy, the higher the goals individuals set for themselves and the stronger their commitment to achieving them (Bandura, 1989).

Studies conducted both in Iran and internationally indicate that self-compassion and metacognition-based research play a significant role in enhancing various psychological indices, including self-efficacy. The relationship between self-compassion and constructs such as students' academic procrastination (Dasht Bozorgi & Homaee, 2018), psychological flexibility (Khedmati, 2020), work-family conflict and resilience (Mosavi & Alvani, 2019), perfectionism and mental vitality (Yazdani & Fouladchang, 2020), and teachers' job burnout (Malekpourlapari & Bakhtiarrenani, 2021) has been examined in domestic research. Souza and Hutz explained that in situations where individuals perceive outcomes as contingent upon their own efforts, successful efforts enhance self-efficacy beliefs, whereas perceived failure has the opposite effect. More self-compassionate individuals can interpret their failures as part of the shared human experience, treat themselves kindly, and respond to their thoughts and emotions in a more balanced manner, which explains the significant relationship between self-efficacy and self-compassion (Souza & Hutz, 2016). Alfonsson et al. reported that self-compassion protects individuals' self-efficacy when facing failure and explains the positive association between these variables (Alfonsson et al., 2022). In a study by Manavipour and Saeedian, self-efficacy was predicted based on self-compassion and control beliefs about learning. Stepwise multiple regression showed that while control beliefs about learning and mindfulness positively predicted self-efficacy, over-identification negatively predicted it. Furthermore, control beliefs about learning had the largest contribution in predicting self-efficacy. Correlation analyses revealed that self-kindness, common humanity, mindfulness, and control beliefs about learning were positively correlated with self-efficacy, whereas isolation and over-identification were negatively associated with it (Manavipour & Saeedian, 2016). Woods et al. examined the relationship between dysfunctional attitudes, maladaptive perfectionism, metacognition, and manic and depressive symptoms in bipolar disorder, with self-compassion as a mediating factor. They found that, cross-sectionally, self-compassion partially mediated the relationship between all maladaptive cognitions and depression, such that higher dysfunctional cognitions and lower self-compassion were associated with greater depressive symptom severity. Self-compassion also partially mediated the relationship between dysfunctional attitudes and mania; however, this relationship was weak, suggesting that higher self-compassion predicted greater mania (Woods et al., 2024).

Overall, findings from the literature review confirm the importance of training psychological skills such as self-compassion and metacognition to enhance self-efficacy and cope with stress, and introduce these variables as effective and practical approaches in educational, clinical, and organizational settings.

Given that the present study used single-gender sampling (women only), it is necessary to provide a brief background on gender differences in the key variables of this research (self-compassion, self-efficacy, and metacognition). A meta-analysis by Yarnell et al. indicates that, overall, men report slightly (but modestly) higher levels of self-compassion than women, although the effect size is small and influenced by moderating factors such as age, cultural context, and gender-role orientation (Yarnell et al., 2018). Some studies have also shown that patterns of self-efficacy may vary depending on the performance domain (e.g., mathematics versus verbal skills); meta-analytic evidence suggests that overall gender differences in self-efficacy are small, but in certain domains (such as technical/mathematical skills), they may favor men (Huang, 2013). In a study by Kumar and Lal involving 200 male and female students, the roles of self-efficacy and gender differences in cognitive performance were examined. The results indicated that self-efficacy had a significant effect on mental ability, and females obtained higher scores than males, with no significant interaction between self-efficacy and gender. These findings suggest that gender differences in certain cognitive domains may emerge independently of self-efficacy levels (Kumar and Lal, 2006). About metacognition, evidence remains mixed. Some studies have reported minor differences between females and males, whereas other investigations and meta-analyses have found no significant differences; overall, the evidence for a definitive gender difference in global metacognition is weak or inconsistent (Xue et al., 2024).

A review of previous studies indicates that the relationship between self-compassion and self-efficacy has been supported in several investigations (Zessin et al., 2015). Moreover, the role of metacognition in emotion regulation, self-appraisal, and cognitive processing has been widely emphasized within the Self-Regulatory Executive Function (S-REF) model (Wells & Matthews, 1996). However, previous studies have not examined the integrated structure of these three constructs within a single structural model, and research simultaneously investigating the effect of self-compassion on self-efficacy through the mediating role of metacognition remains very limited. Furthermore, no study has examined this model among single midlife women, a group characterized by distinct psychological and social features. Therefore, a structural analysis of the proposed conceptual model may enrich the research literature. Given that the present study focuses on midlife women, the use of a single-gender sample was intended to control for potential gender differences and to concentrate on

psychological constructs specific to this group. Existing evidence also suggests that some of the study variables may exhibit different patterns in men and women; thus, examining one gender separately may enhance the precision of interpretations and the validity of findings.

To clarify the research problem, the conceptual model illustrating the relationships among the variables was developed as shown in Figure 1.

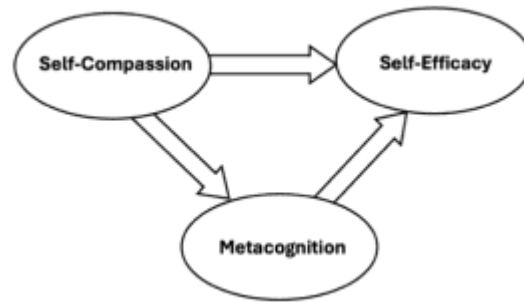


Figure 1

Conceptual Model of the Study

This model was designed based on the literature review and empirical evidence and depicts the hypothesized pathways among the study's main constructs. Previous research has shown that self-compassion can enhance individuals' self-efficacy by strengthening psychological resilience and providing adaptive coping strategies in the face of stress (Smith, 2015). In addition, metacognition is proposed as a mediating variable, as mindfulness and cognitive regulation enable individuals to utilize self-compassion to improve the positive regulation of their behaviors, thereby increasing self-efficacy (Cecen & Gümüş, 2025). Accordingly, based on theoretical foundations and empirical evidence, the present study considers self-compassion as the predictor variable, metacognition as the mediator explaining the underlying mechanisms, and self-efficacy as the outcome variable. These selections are grounded in theoretical models and prior research on emotion regulation, metacognitive processing, and self-efficacy.

The main objective of the present study is to examine the effect of self-compassion on self-efficacy, considering the mediating role of metacognition in single midlife women. Accordingly, the research hypotheses are as follows: (A) self-compassion has a direct effect on metacognition in single midlife women; (B) self-compassion has a direct effect on self-efficacy in single midlife women; (C) metacognition has a direct effect on self-efficacy in single midlife women; and (D) self-compassion has an indirect effect on self-efficacy through metacognition in single midlife women.

Method

Population, Sampling Method, and Sample Size

The present study employed a descriptive–correlational design using a structural equation modeling (SEM) approach. The statistical population consisted of all single midlife women aged 40 to 65 years residing in Tehran, Iran. In this study, participants were selected from among women who were accessible and met the inclusion criteria. Participants were recruited through an online call (via social media and related groups) and through voluntary referrals from other participants. In this research, “accessible” referred to women who could communicate directly and voluntarily with the researcher or who were introduced to the study through the aforementioned channels. According to Rahi et al.'s study, convenience sampling is the process of collecting data from a population that is readily accessible to the researcher (Rahi et al., 2017). MacNealy, in distinguishing between probability and non-probability sampling, defined convenience sampling as a method in which the researcher approaches individuals in public settings and invites them to participate in the study. Since convenience sampling involves using readily available samples, this method can be applied to nearly any type of research (Golzar et al., 2022).

The inclusion criteria were: being a single midlife woman aged 40 to 65 years, having at least basic literacy sufficient to complete the questionnaires, and willingness to participate voluntarily in the study. The exclusion criteria included: a history of severe psychiatric disorders, use of psychoactive medications affecting cognition and emotion, and unwillingness to complete the questionnaire. To ensure ethical standards and confidentiality, no official medical records were reviewed, and the researcher had no access to any clinical centers. Assessment of exclusion criteria (e.g., history of severe psychiatric disorders or use of psychoactive medications) was based on participants' self-reports in the screening section of the questionnaire and self-report items.

Regarding sample size, determining a universally acceptable minimum sample size that is statistically adequate is challenging. However, a review of typical sample sizes in structural equation modeling studies, particularly in education and psychology (MacCallum & Austin, 2000), indicates that the median sample size in SEM research is approximately 200. The sample size for the present study was estimated using Cochran's formula for an unlimited population, and a total of 225 participants was deemed appropriate.

Measures

In the present study, standardized and validated questionnaires were used to measure self-compassion, self-efficacy, and metacognition, as described below.

1. Self-Compassion Scale (SCS): The Self-Compassion Scale was developed by Neff and consists of 26 items assessing both the positive and negative aspects of three core dimensions of self-compassion: self-kindness (5 items) versus self-judgment (5 items), common humanity (4 items) versus isolation (4 items), and mindfulness (4 items) versus over-identification (4 items). Responses are rated on a 5-point Likert scale ranging from “rarely” to “almost always.” The mean score of the six components (after reverse-scoring the negative subscales) represents the overall self-compassion score. To compute the total score, the negative subscales—self-judgment, isolation, and over-identification—are reverse-scored.

Neff reported internal consistency reliability using Cronbach’s alpha, ranging from 0.75 to 0.81 for the subscales and 0.92 for the total scale. Test-retest reliability over a two-week interval was reported as 0.93 (Neff, 2003). In Iran, Khosravi et al. reported Cronbach’s alpha coefficients ranging from 0.79 to 0.85 for the subscales and 0.74 for the total score. Additionally, divergent validity with the Beck Depression and Anxiety Inventories was -0.34 and -0.41 , respectively, and convergent validity with the Rosenberg Self-Esteem Scale was 0.22 (Saeeda et al., 2022). In the present study, internal consistency reliability, as assessed by Cronbach’s alpha, was 0.89 for the total scale. Cronbach’s alpha coefficients for the subscales were as follows: self-kindness = 0.87, self-judgment = 0.81, common humanity = 0.84, and mindfulness = 0.85, indicating satisfactory reliability in the current sample.

2. General Self-Efficacy Scale (GSE-10): The General Self-Efficacy Scale was originally developed by Schwarzer and Jerusalem in 1979 to assess generalized self-efficacy and was revised in 1981. This scale reflects an individual’s optimistic belief about their ability to cope with difficult demands. Individuals with high self-efficacy are better able to manage and solve problems and adapt to challenging situations. The scale consists of 10 items rated on a 4-point Likert scale (1-4), yielding a minimum score of 10 and a maximum of 40. The scale has been used to predict adaptation following life changes and to assess functioning across developmental stages, as well as in clinical and behavior-change research (Schwarzer & Jerusalem, 1995).

In cross-cultural studies involving more than 1,900 participants from Germany, Poland, and South Korea, consistent evidence was found for significant associations between general self-efficacy and socio-cognitive variables, coping strategies, well-being, and health behaviors, supporting the construct validity of the scale. The scale also demonstrated good internal consistency reliability across samples, indicating that the General Self-Efficacy Scale is a reliable and valid instrument for measuring a global sense of self-efficacy (Luszczynska et al., 2005). In Iran, Rajabi evaluated the reliability and validity of the General Self-Efficacy Scale among psychology students at Shahid Chamran University of Ahvaz and Islamic Azad University of Marvdasht in 2016. Cronbach’s alpha coefficients were 0.82 for the total scale, 0.84 for Shahid Chamran University, and 0.80 for Islamic Azad University. Concurrent validity with the Rosenberg Self-Esteem Scale was 0.30 overall (0.20 and 0.23 in the respective samples), all of which were statistically significant (Rajabi, 2016). In the present study, Cronbach’s alpha for the General Self-Efficacy Scale was 0.88, indicating good reliability.

3. Metacognitions Questionnaire (MCQ-30): The Metacognitions Questionnaire (MCQ-30) was developed and validated by Wells and Cartwright-Hatton in 2004. This 30-item self-report instrument assesses individuals’ beliefs about their thinking processes. It was designed to measure several metacognitive components, some of which play a central role in the metacognitive model of psychological disorders. Responses are rated on a 5-point Likert scale ranging from 1 (“do not agree”) to 5 (“strongly agree”).

The scale includes five subscales: positive beliefs about worry, beliefs about uncontrollability and danger of thoughts, cognitive confidence, need to control thoughts, and cognitive self-consciousness. In the original validation study, the five-factor structure was supported through exploratory and confirmatory factor analyses, and both the total scale and subscales demonstrated satisfactory reliability, providing strong evidence for construct validity (Wells & Cartwright-Hatton, 2004). Wells and colleagues reported Cronbach’s alpha coefficients ranging from 0.72 to 0.93 for the subscales, and test-retest reliability over 18–22 days was 0.75 for the total score and 0.59–0.87 for the subscales (Wells & Sembi, 2004). The Persian version of the MCQ-30 was psychometrically evaluated by Shirinzadeh Dastgiri et al., showing excellent internal consistency (Cronbach’s alpha = 0.91) and confirmation of the five-factor structure, supporting construct validity in the Iranian sample (Shirinzadeh Dastgiri et al., 2009). In the present study, Cronbach’s alpha for the Persian version was 0.90, indicating good reliability.

Data Analysis

The present study used a descriptive survey design. Data were collected through an online questionnaire administered via the Porsline platform. To ensure adherence to ethical research principles, participants were provided with a full explanation at the beginning of the questionnaire regarding the study objectives, confidentiality of information, and their voluntary participation. After reviewing this information, participants provided informed consent and completed the questionnaire willingly.

To increase response rate and data quality and to reduce social desirability bias, anonymous self-report measures were used. After completing the sampling process and reaching the required sample size, statistical analyses were conducted. Data analysis was performed using SPSS version 26 and LISREL version 8 at both descriptive and inferential levels.

Development of the structural equation model required careful examination of key assumptions, which in the present study included three main steps: detection of outliers, assessment of skewness and kurtosis, and evaluation of multivariate normality. Pearson correlation coefficients were used to examine relationships among variables. Structural equation modeling was then conducted to analyze direct and indirect relationships and to test the study hypotheses in both standardized and significance models. In the standardized solution, path coefficients and factor loadings (indicating the strength of the relationship between each item and the latent variable) were reported in standardized form, meaning that all variables were transformed into z-scores. In the significance model, the factor loadings were assessed for statistical significance using t-statistics. Finally, model fit was evaluated to assess how well the structural model fit the observed data.

Results

In examining the demographic characteristics of the sample, approximately 78% of the 225 participants in the present study had been married, whereas 22% had never been married. The mean age of the participants was 47.28 years ($SD = 9$), ranging from 26 to 73 years. Table 1 presents the mean, standard deviation, minimum, and maximum scores of the main study variables.

Table 1
Descriptive Statistics of the Study Variables

Variable	Mean	Standard Deviation	Minimum Score	Maximum Score
Self-Kindness	16.73	3.69	6	25
Self-Judgment	15.22	3.26	7	23
Common Humanity	12.81	2.75	6	20
Isolation	13.43	2.92	6	20
Mindfulness	13.29	2.43	6	20
Overidentification	12.21	2.18	6	17
Self-Compassion (Total)	83.70	10.96	53	114
Positive Beliefs about Worry	15.52	4.42	6	27
Negative Beliefs about Uncontrollability & Danger	18.01	4.40	6	30
Cognitive Confidence	17.02	4.68	6	29
Beliefs about Need to Control Thoughts	18.98	3.88	9	29
Cognitive Self-Consciousness	23.48	3.55	13	33
Metacognition (Total)	93.01	14.11	52	141
Self-Efficacy	28.83	4.49	15	38

In the present study, the Mahalanobis distance was used to detect outliers. The maximum Mahalanobis distance obtained was 12.881, which did not exceed the critical value for 2 degrees of freedom; therefore, none of the participants were identified as multivariate outliers.

Multivariate normality is a necessary assumption for parameter estimation in structural equation modeling. In this study, multivariate normality was examined using Mardia's coefficient. The z-value of Mardia's coefficient was 2.32, indicating that the null hypothesis of multivariate normality was supported at the 95% confidence level. Given the sample size ($N = 225$), maximum likelihood estimation was considered reliable.

Structural Equation Model

Regarding the goodness-of-fit indices of the structural model, the chi-square value (χ^2) was 108.43 with 64 degrees of freedom (df). The χ^2/df ratio was 1.69, well below the recommended threshold of 3, indicating an acceptable model fit. The results presented in Table 2 show that the overall goodness-of-fit indices of the structural model were within acceptable ranges. The results of the overall model fit indices in Table 2 indicate that the structural model demonstrated an adequate fit; therefore, the research hypotheses were tested based on the confirmed structural model.

Table 2
Overall Fit Indices of the Structural Model

Index	Calculated Value	Acceptable Threshold	Fit Evaluation
Root Mean Square Error of Approximation (RMSEA)	0.062	Less than 0.08	Excellent
Goodness of Fit Index (GFI)	0.90	0.90 and above	Excellent
Adjusted Goodness of Fit Index (AGFI)	0.88	0.90 and above	Good
Normed Fit Index (NFI)	0.92	0.90 and above	Excellent
Non-Normed Fit Index (NNFI)	0.91	0.90 and above	Excellent
Comparative Fit Index (CFI)	0.93	0.90 and above	Excellent
Incremental Fit Index (IFI)	0.90	0.90 and above	Excellent
Standardized Root Mean Square Residual (SRMR)	0.029	Less than 0.05	Excellent

The standardized path coefficients and t-values (critical ratios) for the structural model predicting self-efficacy in middle-aged single women are presented in Table 3. The findings reported in Table 3 indicate that the factor loadings were within acceptable levels and that the critical ratios were greater than 2.58; therefore, the path coefficients were statistically significant at the 99% confidence level.

Based on the confirmed structural model, the results of hypothesis testing are presented in Table 4. The findings indicated that self-compassion had a direct and significant effect on metacognition ($p < 0.01$). Since no indirect path was specified for this relationship, the total effect equaled the direct effect. Therefore, the first hypothesis was supported.

Table 3
Standardized Factor Loads and Significant Values of the Structural Model

Main Scale	Components	Factor Loading	Critical Ratio (t)	Significance
Self-Compassion	Self-Kindness	0.33	4.17	$p < 0.01$
	Self-Judgment	0.35	4.45	$p < 0.01$
	Common Humanity	0.41	5.39	$p < 0.01$
	Isolation	0.40	5.26	$p < 0.01$
	Mindfulness	0.44	5.98	$p < 0.01$
	Over-Identification	0.49	6.70	$p < 0.01$
Metacognition	Positive Beliefs About Worry	0.57	7.36	$p < 0.01$
	Beliefs About Uncontrollability and Danger of Thoughts	0.61	7.91	$p < 0.01$
	Cognitive Confidence	0.56	7.22	$p < 0.01$
	Beliefs About the Need to Control Thoughts	0.66	8.78	$p < 0.01$
	Cognitive Self-Consciousness	0.70	9.40	$p < 0.01$
Self-Efficacy	Self-Efficacy	0.89	15.96	$p < 0.01$

The findings presented in Table 4 also indicated that self-compassion had a direct and significant effect on self-efficacy ($p < 0.01$). No indirect effect was reported for this path; therefore, the total effect was equal to the direct effect, and the second hypothesis was supported. According to Table 4, metacognition had a direct and significant effect on self-efficacy ($p < 0.01$). As no indirect path was specified in this relationship, the total effect was equal to the direct effect. Therefore, the third hypothesis was supported. The results of the structural model showed that self-compassion, in addition to its direct effect on self-efficacy ($p < 0.01$), also had a significant indirect effect on self-efficacy through metacognition ($p < 0.01$). The total effect of self-compassion on self-efficacy was reported as 0.57. Given that both the direct and indirect effects were significant simultaneously, the mediating role of metacognition was confirmed as partial mediation. Therefore, the fourth hypothesis of the present study was also supported.

Table 4
Estimates of Direct and Indirect Effect Coefficients

Hypothesis	Relationship	Direct Effect	Indirect Effect	Total Effect	Standard Error	Critical Ratio (t)	Significance
A	Self-Compassion → Metacognition	0.39	–	0.39	0.03	5.18	$p < 0.01$
B	Self-Compassion → Self-Efficacy	0.33	–	0.33	0.04	4.29	$p < 0.01$
C	Metacognition → Self-Efficacy	0.62	–	0.62	0.07	8.47	$p < 0.01$
D	Self-Compassion → Metacognition → Self-Efficacy	0.33	0.24	0.57	0.04	14.25	$p < 0.01$

Discussion and Conclusion

Middle-aged single women, as a growing segment of the population, face unique psychological and social challenges that distinguish them from other age and demographic groups. Therefore, examining and identifying factors influencing the psychological well-being and psycho-social functioning of this group is of considerable importance in psychological research and can contribute to the development of supportive and therapeutic interventions.

The present study's analysis indicated that self-compassion has a direct, positive effect on metacognition among middle-aged single women. Self-compassion, as a psychological construct, comprises three main components: self-kindness, recognition of common humanity, and mindfulness (Neff, 2003). These components, particularly mindfulness, are closely related to metacognition. By reducing self-criticism and enhancing self-acceptance, self-compassion enables middle-aged women to engage in cognitive analysis and reconstruction rather than ruminating or becoming entangled in negative thought patterns, which often impede optimal metacognitive functioning. This finding aligns with prior studies, such as Germer and Neff, which demonstrated that self-compassion can improve mindfulness and emotional regulation—two components directly associated with metacognition (Germer & Neff, 2013). Empirical evidence also supports the relationship between these cognitive processes and self-compassion. For instance, Allen et al. found that higher levels of compassion significantly predicted better performance on theory-of-mind tasks in a healthy adult sample (Allen et al., 2017). Emotional intelligence, which encompasses the ability to recognize and regulate one's own and others' emotions, has also been shown to be strongly associated with higher self-compassion in

adolescent (Castilho et al., 2017) and nursing samples (Heffernan et al., 2010). The present study's findings are consistent with other research showing that mindfulness practice enhances self-compassion (Campos et al., 2016; L'Estrange et al., 2016; Neff & Pommier, 2013). Independent studies have also identified self-compassion as a mediator between mindfulness and well-being (Evans et al., 2018; Hollis-Walker & Colosimo, 2011). Overall, these findings indicate established relationships between self-compassion and constructs such as mindfulness, cognitive insight, and metacognition.

The second hypothesis, also confirmed in this study, showed that self-compassion has a direct, positive effect on self-efficacy among middle-aged single women. By reducing self-criticism and increasing self-acceptance, self-compassion can decrease feelings of failure or inadequacy, which directly impact self-efficacy. For example, a middle-aged woman who learns to be kinder to herself and to view past failures as part of the human experience is more likely to develop greater confidence in her ability to handle future challenges. Furthermore, the mindfulness component of self-compassion enables individuals to evaluate their abilities more consciously and avoid negative thought patterns that might undermine self-efficacy. This is particularly important for middle-aged single women, who may have faced more complex life experiences. In other words, self-compassion enhances mindfulness, helping individuals focus on internal resources and experience greater competence and self-efficacy (Hollis-Walker & Colosimo, 2011).

The third confirmed hypothesis indicated that metacognition has a direct and positive effect on self-efficacy among middle-aged single women. Metacognition, defined as "thinking about thinking," consists of two primary components: metacognitive knowledge and metacognitive regulation (Flavell, 1979). This construct helps individuals become aware of and manage their cognitive processes. On the other hand, self-efficacy refers to an individual's belief in their ability to perform tasks and achieve goals. The relationship between these constructs is justifiable, as metacognitive awareness and regulation enable individuals to better evaluate their cognitive and emotional resources, thereby strengthening their belief in their own abilities (Bandura, 1997). These findings are consistent with previous research, such as Schraw and Moshman, who reported that metacognitive abilities positively relate to self-efficacy in performing complex tasks (Schraw & Moshman, 1995). Moreover, Coutinho found that students with higher metacognitive awareness reported greater self-efficacy in learning and problem-solving (Coutinho, 2008). Although these studies were primarily conducted in educational contexts, the results can be generalized to broader life contexts, particularly for middle-aged single women, as this age group typically possesses cognitive maturity that may enhance their metacognitive abilities.

Finally, the present study's analysis revealed that self-compassion has a significant indirect effect on self-efficacy through metacognition. By reducing self-criticism and increasing mindfulness, self-compassion allows individuals to more consciously evaluate their thoughts and cognitive processes (Wakelin et al., 2022), thereby enhancing metacognition. Metacognitive awareness and regulation, in turn, facilitate the identification and reconstruction of maladaptive thought patterns (e.g., negative beliefs about personal abilities), ultimately strengthening self-efficacy. For example, a middle-aged woman who learns to respond to failures with kindness rather than self-blame may, through enhanced metacognitive monitoring, realize that her abilities exceed previous assumptions, thereby positively influencing her self-efficacy. This finding aligns with previous research, such as Germer and Neff, demonstrating that self-compassion can improve resilience and perceived competence by enhancing mindfulness, a component closely linked to metacognition (Germer & Neff, 2013). Studies by Coutinho and Neuman also indicate that metacognition can mediate the relationship between emotional factors (e.g., self-compassion) and cognitive outcomes (e.g., self-efficacy) (Coutinho & Neuman, 2008). Middle-aged single women may encounter social pressures, such as stereotypes related to singlehood or gender roles, which can affect self-efficacy. Self-compassion, by providing an emotional buffer and enhancing metacognition, may help them manage these pressures and develop more positive beliefs about their abilities. This is consistent with the findings of Zessin et al., which showed that self-compassion can improve self-efficacy and mental health through cognitive and emotional pathways, including metacognition (Zessin et al., 2015). Overall, this study's results indicate that self-compassion can enhance self-efficacy in middle-aged single women, both directly and indirectly through improvements in adaptive metacognitive processes. These findings align with the existing literature on the role of self-compassion in psychological adaptation (Neff, 2011) and suggest that focusing on metacognition can be an effective intervention strategy to increase self-efficacy. Accordingly, strengthening self-compassion and metacognition can be an effective strategy in psychological interventions designed to empower middle-aged single women and enhance their self-efficacy. For example, mindfulness- and self-compassion-based training programs could be developed and evaluated for their direct and mediated effects on self-efficacy.

One limitation of the present study is the homogeneity of the sample, which limits the generalizability of the findings to a specific population and fails to account for cultural, gender, or regional diversity. To enhance generalizability, future research should include more diverse samples, such as married middle-aged women, women from different cultural or geographical contexts, or middle-aged men. Additionally, future studies should incorporate qualitative data, such as semi-structured interviews, to further develop and deepen understanding of the experiences of middle-aged single women regarding self-compassion, metacognition, and self-efficacy. Moreover, it is suggested that the findings of this study be applied in institutions such as national retirement organizations and other centers serving middle-aged populations. As these centers attract large numbers of middle-aged individuals, training programs focused on enhancing self-compassion could improve self-efficacy in this age group.

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