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Comparative Effectiveness of Transactional Analysis Group Therapy and Protection Motivation Theory on Health-Promoting Lifestyles in Middle-Aged Women

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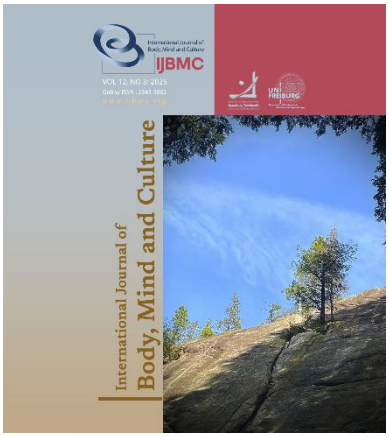

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ABSTRACT

Objective: This study compared the effectiveness of Transactional Analysis (TA) group therapy and Protection Motivation Theory (PMT)-based intervention on improving health-promoting lifestyle behaviors in this population.

Methods and Materials: A quasi-experimental design with pre-test, post-test, and three-month follow-up was conducted among 47 middle-aged women in Tehran. Participants were randomly assigned to one of three groups: TA (8 sessions), PMT (6 sessions), or a control group. The Health-Promoting Lifestyle Profile (HPLP) was used to assess outcomes. Data were analyzed using repeated-measures ANOVA and Bonferroni post hoc tests.

Findings: Both interventions resulted in significant improvements in health-promoting behaviors compared to the control group ($p < 0.05$). The TA group exhibited greater gains, particularly in stress management, interpersonal support, and self-actualization. These improvements were maintained at follow-up.

Conclusion: Transactional Analysis group therapy was more effective than PMT-based intervention in enhancing key aspects of a health-promoting lifestyle among middle-aged women. TA's focus on communication and self-awareness makes it a promising approach for lifestyle interventions targeting this population.

Keywords: Middle Aged, Female, Motivation, Transactional Analysis, Healthy Lifestyle.

Introduction

Women are the cornerstone of family health and social development. The success, survival, and advancement of any society depend on the well-being and vitality of its women. Women play critical roles and hold important responsibilities both within the family and in society, and their physical and psychological health are fundamental prerequisites for effectively fulfilling these roles (Beebwa et al., 2021). Women's

health is recognized as a key indicator of development by the United Nations (Hawkins et al., 2022). Middle adulthood is considered a pivotal period in the lifespan, especially for women, as it is often accompanied by various physical, psychological, emotional, familial, social, and spiritual changes that can significantly affect their mental structure and quality of life (Moreira et al., 2022). According to Kayo and Kao (2022), middle-aged women tend to adopt less healthy and more inactive lifestyles compared to younger women. These lifestyle shifts, combined with the prevalence of unhealthy behaviors in this age group, can compromise their physical and psychological health, underscoring the need for interventions that target lifestyle improvement during middle adulthood (Roca-Ventura et al., 2024).

Scientific evidence suggests that individual lifestyle choices and behavior patterns play a critical role in determining one's health and longevity. This is especially relevant given the epidemiological transition and the increasing prevalence of chronic and non-communicable diseases (Malatskey et al., 2022). A core component of lifestyle that directly impacts health is engagement in health-promoting behaviors (Snelling, 2023). A health-promoting lifestyle refers to a set of positive behaviors, including healthy eating, regular physical activity, and quality sleep, as well as the avoidance of unhealthy habits such as poor diet, alcohol consumption, and smoking (Suksatan et al., 2022). According to Walker (1990), a health-promoting lifestyle is "a multidimensional pattern of self-initiated perceptions and actions that serve to maintain and enhance the level of health and self-actualization." Evidence suggests that adopting such a lifestyle is crucial for disease prevention and enhancing both physical and psychological well-being. For example, research has shown that a healthy lifestyle can improve mental health in older adults, prevent depression, and is significantly related to lower risks of cognitive decline, memory loss, and depression symptoms associated with behaviors such as smoking, obesity, and poor sleep (Aihara et al., 2011). Similarly, Fortner et al. (2000) found that poor health is associated with heightened death anxiety in the elderly. Hence, improving health in older adults can be an effective strategy for reducing death-related anxiety (Bhandari & Paswan, 2021).

Studies have shown that the lifestyle and mental health status of Iranian women are not optimal, and it is projected that by 2025, the average age of the population will increase and the burden of non-communicable diseases among women will rise significantly (Mohsenian et al., 2022; Shahabi et al., 2021). These findings underscore the urgent need to develop effective interventions that promote healthy behaviors among women. One promising approach for enhancing personal and interpersonal functioning, especially in middle-aged women, is Transactional Analysis (TA) training. Transactional Analysis is a theory that focuses on interpersonal communication, life events, and social interactions, offering practical strategies for resolving interpersonal problems (Berne, 1958, 1996). The core idea behind TA is that a significant portion of human life is spent in interpersonal exchanges (Chigangaidze & Chinyenze, 2022; Haynes, 2022). Berne (1958) proposed that personality is organized into three ego states—Parent, Adult, and Child—from which individuals communicate. TA group therapy helps individuals become aware of their ego states and understand how dysfunctional "crossed" transactions can harm well-being, as opposed to "complementary" transactions that foster healthy interactions (Cornell, 2022).

On the other hand, the Protection Motivation Theory (PMT) has emerged as one of the most effective models for predicting preventive behaviors, gaining attention in recent health behavior research (Marikyan & Papagiannidis, 2023). This model emphasizes the motivational process and the development of coping strategies. It explains behavioral intention through two cognitive mediating processes: threat appraisal (encompassing perceived severity, vulnerability, and rewards associated with maladaptive behavior) and coping appraisal (encompassing self-efficacy, response efficacy, and perceived response costs) (Norman et al., 2015). Fear is conceptualized as a mediating factor between perceived vulnerability and threat appraisal (Kim et al., 2022). Protection motivation—equated with behavioral intention—acts as an intermediary between threat/coping appraisal and actual protective behavior (Mou et al., 2022). To activate protection motivation, the perceived severity and vulnerability of unhealthy behavior must outweigh the perceived rewards. In contrast, the perceived efficacy of protective actions must exceed the perceived costs of engaging in them (Acar & Kıcali, 2022).

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A review of past studies reveals that TA interventions have been effective in enhancing interpersonal relationships, self-awareness, reducing depression and stress, and improving quality of life (Lapworth & Sills, 2011; Stewart, 2007). Research by Wes & Van Ryn (2021, 2024) and Wiedowson (2018) confirmed the effectiveness of TA in promoting quality of life and health-enhancing behaviors (Vos & van Rijn, 2021, 2024; Widdowson, 2018). Similarly, Mazetti (2020) and Kark (2016) highlighted the role of TA in stress and weight management (Kark, 2016; Mazzetti, 2020). Sepahpour (2022) and Goulding (2014) emphasized the contribution of TA to personal responsibility and self-actualization (Goulding, 2014; Sepahpour, 2022). Studies by Carter & Dalla (2006) also reported improvements in mental health and interpersonal communication through TA (Carter & Dalla, 2006). Additionally, Hosseini et al. (2021) and Chamroonsawasdi et al. (2021) found that TA can positively influence attitudes and intentions related to healthy eating and physical activity (Chamroonsawasdi et al., 2021). Morovati-Sharifabad et al. (2021) and Mirkarimi et al. (2017) demonstrated the utility of PMT in promoting physical activity and improving physiological indices in individuals with Type 2 diabetes (Morowatisharifabad et al., 2021). Likewise, Khazayan et al. (2021) reported the model's effectiveness in encouraging preventive behaviors among adolescents (Khazaeian et al., 2021). Sharifi et al. (2022) confirmed the positive effects of PMT-based interventions on improving preventive behaviors related to fatty liver disease in women (Sharifi et al., 2022).

Despite existing research, a significant gap remains: most previous studies have examined the effectiveness of TA and PMT independently in promoting health behaviors. However, few have directly compared the two approaches, especially in middle-aged women. Prior research has also tended to focus on specific health behaviors such as nutrition or physical activity, neglecting other important dimensions of a health-promoting lifestyle—such as stress management, responsibility, and self-awareness—that warrant comprehensive investigation. Furthermore, most studies have focused on adolescents or clinical populations, whereas middle-aged women—who experience unique physical, psychological, and social transitions—have received less scholarly attention.

This study seeks to fill that gap by comparing the effects of Transactional Analysis group therapy and Protection Motivation Theory-based training on promoting health-enhancing lifestyle behaviors in middle-aged women. TA emphasizes interpersonal and intrapersonal development, while PMT focuses on behavioral intentions and perceived threats and benefits. The contrast between their psychological and motivational emphases, combined with their complementary strengths in group interventions, makes them ideal for comparative analysis. Given the distinct challenges faced by middle-aged women, these two approaches offer promising avenues for enhancing their well-being and lifestyle. Accordingly, the present study aimed to answer the following research question: Is there a significant difference between the effectiveness of Transactional Analysis group therapy and Protection Motivation Theory-based training on the health-promoting lifestyle of middle-aged women?

Methods and Materials

Study Design and Participants

This study was conducted in a natural setting and employed a quasi-experimental, pretest-posttest-follow-up design with a control group. The statistical population consisted of all women aged 40 to 60 residing in Tehran during the 2022–2023 period. Participants were recruited through online advertisements posted on social media, inviting them to participate in the study at the Homa Counseling and Psychotherapy Center. A convenience sampling method was employed. Among those who responded and met the inclusion criteria, 60 participants were selected for the study.

According to Delavar (2019), for a quasi-experimental design, a minimum of 20 participants per group is recommended, taking into account potential attrition. Accordingly, 60 women aged 40 to 60 were randomly assigned to three groups: (1) Transactional Analysis (TA) group therapy, (2) Protection Motivation Theory (PMT)-based intervention, and (3) a control group. The TA group received eight 90-minute sessions of group counseling based on Berne's Transactional Analysis model (1958), while the PMT group participated in six 90-minute sessions based on Rogers' Protection Motivation Theory (1975). The control group remained on a waiting list. All three groups completed the Health-

Promoting Lifestyle Profile (Walker et al., 1995) during the pretest, posttest, and follow-up phases.

Inclusion criteria were as follows: (1) female gender, (2) age range between 40 and 60 years, (3) minimum literacy to complete self-report questionnaires, (4) availability to participate in therapy sessions and complete all questionnaires, and (5) providing informed and voluntary consent. Exclusion criteria included: (1) absence from more than two sessions, (2) failure to complete assigned homework, (3) incomplete responses to pretest, posttest, or follow-up questionnaires, (4) participation in any psychotherapy program during the past six months, and (5) presence of severe psychiatric conditions or substance use.

Instruments

Health-Promoting Lifestyle Profile (HPLP): The HPLP was developed by Walker et al. (1995) and is a 52-item self-report questionnaire measuring health-promoting lifestyle behaviors that reflect proactive and self-directed efforts to improve physical, psychological, and social well-being. The scale includes six subscales: Nutrition (Items 1–11), Physical Activity (Items 12–24), Health Responsibility (Items 25–32), Stress Management (Items 33–38), Interpersonal Support (Items 39–46), and Self-Actualization (Items 47–54). Responses are rated on a 4-point Likert scale ranging from "never" (1) to "always" (4). Total scores range from 54 to 216, with higher scores indicating a more health-promoting lifestyle. Walker et al. (1997) reported a Cronbach's alpha of 0.94 for the overall scale. Subscale reliability coefficients were 0.86 for health responsibility, 0.85 for physical activity, 0.80 for nutrition, 0.86 for spiritual growth, 0.87 for interpersonal relations, and 0.79 for stress management. Test-retest reliability over a three-week period yielded a coefficient of 0.89. Mohammadi-Zeidi et al. (2011) validated the Persian version and found acceptable psychometric properties, with Cronbach's alphas ranging from 0.64 to 0.91 for the subscales, and 0.82 for the total scale. The six-factor structure was confirmed through confirmatory factor analysis (Mohammadi Zeidi et al., 2011).

Intervention

After obtaining ethical approval from Islamic Azad University, Karaj Branch, and coordinating with the Homa Counseling Center, advertisements were posted in online forums targeting women aged 40–60 in Tehran. Eligible volunteers were screened based on the inclusion criteria. Sixty participants were randomly assigned to three groups: TA (n = 14), PMT (n = 16), and control (n = 17). These figures represent the final sample after accounting for participant attrition. Sessions were held in the Homa Counseling Center, a location chosen for its accessibility and suitability for therapeutic interventions. The session times were scheduled consistently to maximize attendance.

TA Group Session Content:

1: Introduction of group goals, rules, and member orientation.

2: Overview of Transactional Analysis theory and key terminology.

3: Explanation and practical exercises on the Parent ego state.

4: Group discussion and practice of the Child ego state.

5: Explanation and application of the Adult ego state and how to recognize ego states in others.

6: Practice of ego states; introduction of contamination and exclusion; discussion of life scripts.

7. Analysis of complementary and cross-transactional dynamics; relational dynamics.

8: Discussion of healthy communication and maintaining Adult ego state; posttest administration.

PMT-Based Session Content

1: Education on health, dimensions of well-being, risky behaviors, healthy habits, and self-care.

2: Motivational needs assessment, stress and anxiety management, relaxation techniques.

3: Application of PMT to increase perceived threat and change unhealthy lifestyle attitudes.

4: Enhancing self-efficacy through peer modeling based on Bandura's theory.

5: Increasing response efficacy via symbolic modeling (video-based learning).

6. Discussion of perceived costs, motivational interviewing, and post-test administration.

Data Analysis

Data were analyzed using both descriptive (mean, standard deviation) and inferential statistics: a repeated-measures ANOVA was used to assess the within- and between-group differences over time. SPSS version 26 was employed for all statistical analyses.

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Findings and Results

A total of 47 participants completed the study, divided into three groups: the Transactional Analysis (TA) group therapy group (n = 14), the Protection Motivation Theory (PMT) intervention group (n = 16), and the control group (n = 17). The mean and standard deviation (SD) of participants' age were 49.71 ± 5.95 years in the TA group, 47.25 ± 4.78 years in the PMT group, and 49.29 ± 5.30 years in the control group. Regarding marital status, the TA group included one single participant, 11 married participants, one divorced participant, and one widowed participant. In the PMT group, 3 were single and 13 were married. In the control group, two individuals were single, 13 were married, and two were divorced. In terms of educational attainment, among the TA group, 2 participants had less than a high school diploma, 7 held a high school diploma, and 5 had higher education. In the PMT group, 1 had less than a diploma, 8 had a diploma, and 7 had higher education. In the control group, 3 had less than a diploma, 6 had a diploma, and 8 had higher education.

Table 1

Means and Standard Deviations of Health-Promoting Lifestyle Components Across Time

Component	Group	Pre-test (M ± SD)	Post-test (M ± SD)	Follow-up (M ± SD)
Nutrition	TA	20.28 ± 5.52	26.21 ± 4.85	27.14 ± 4.97
	PMT	21.06 ± 4.81	29.62 ± 5.50	31.37 ± 6.10
	Control	19.59 ± 4.11	20.17 ± 3.83	19.82 ± 4.21
Physical Activity	TA	25.93 ± 6.71	39.64 ± 5.58	37.57 ± 5.90
	PMT	27.68 ± 6.84	33.56 ± 6.80	33.50 ± 7.45
	Control	25.23 ± 6.33	25.00 ± 5.64	24.82 ± 4.86
Health Responsibility	TA	13.14 ± 3.52	19.07 ± 3.75	19.71 ± 2.89
	PMT	12.75 ± 3.21	17.68 ± 3.34	16.75 ± 2.82
	Control	12.41 ± 3.20	13.06 ± 3.11	12.35 ± 3.31
Stress Management	TA	8.93 ± 2.33	14.50 ± 2.68	14.57 ± 2.95
	PMT	8.50 ± 2.16	11.63 ± 2.31	12.13 ± 2.25
	Control	9.41 ± 2.15	8.65 ± 1.87	8.59 ± 2.40
Interpersonal Support	TA	13.50 ± 2.17	21.64 ± 4.34	22.57 ± 4.48
	PMT	14.94 ± 2.77	18.59 ± 3.20	18.87 ± 3.26
	Control	15.18 ± 2.43	15.12 ± 2.85	15.82 ± 3.11
Self-Actualization	TA	18.07 ± 3.15	23.57 ± 4.56	22.57 ± 3.60
	PMT	17.37 ± 3.09	20.75 ± 3.34	19.68 ± 3.05
	Control	17.76 ± 2.84	16.41 ± 3.08	16.23 ± 2.59
Total Score	TA	99.85 ± 12.02	144.64 ± 14.87	144.14 ± 14.01
	PMT	102.31 ± 8.97	131.87 ± 11.51	132.31 ± 10.36
	Control	99.60 ± 13.00	98.41 ± 9.92	97.70 ± 10.19

As shown in Table 1, both experimental groups showed improvements in all lifestyle components and total scores in the post-test and follow-up stages. In contrast, the control group showed no significant change. Tests for normality (Shapiro–Wilk) revealed non-normal distributions for the nutrition variable in the PMT group during the post-test (p = 0.047) and stress management in the TA group during follow-up (p = 0.043). However, due to the robustness of repeated-measures ANOVA and similar sample sizes across groups, the assumptions were deemed acceptable. Levene's test confirmed homogeneity of error variances across groups and time. Box's M and Mauchly's sphericity tests (Table 2) indicated partial violations, particularly for the nutrition variable, for which Greenhouse-Geisser correction was applied.

Table 2

Box's M and Mauchly's Tests of Assumptions

Variable	M.Box (p)	Mauchly's χ^2 (p)
Nutrition	0.244	0.470
Physical Activity	0.039	0.001*
Responsibility	0.966	0.363
Stress Management	0.122	0.483

Interpersonal Support	0.592	0.319
Self-Actualization	0.148	0.197
Total Score	0.114	0.078

Multivariate tests using Wilks' Lambda showed significant effects of group, time, and group × time interaction on all dependent variables (Table 3).

Table 3

Multivariate Analysis (Wilks' Lambda)

Variable	F	p	Partial η^2
Nutrition	5.12	0.001	0.192
Physical Activity	3.81	0.007	0.151
Responsibility	4.79	0.001	0.183
Stress Management	8.94	0.001	0.294
Interpersonal Support	8.66	0.001	0.287
Self-Actualization	4.78	0.002	0.182
Total Score	15.44	0.001	0.418

Table 4

Repeated Measures ANOVA (Group, Time, and Interaction Effects)

Variable	Group Effect F(p)	Time Effect F(p)	Group × Time F(p)
Nutrition	21.39 (0.001)	34.54 (0.001)	6.21 (0.001)
Physical Activity	25.54 (0.001)	14.47 (0.001)	5.87 (0.001)
Responsibility	17.63 (0.001)	31.05 (0.001)	6.39 (0.001)
Stress Management	20.55 (0.001)	40.85 (0.001)	12.92 (0.001)
Interpersonal Support	18.09 (0.001)	49.51 (0.001)	8.23 (0.001)
Self-Actualization	16.45 (0.001)	9.04 (0.004)	5.88 (0.001)
Total Score	65.26 (0.001)	107.49 (0.001)	28.30 (0.001)

Bonferroni pairwise comparisons revealed that the differences between the pre-test and post-test, as well as the pre-test and follow-up, were statistically significant ($p < 0.001$) for all variables. In contrast, the differences between the post-test and follow-up were not significant, indicating the stability of treatment effects over time. Furthermore, comparison between TA and PMT groups showed that the TA group achieved significantly higher improvements in stress management ($p = 0.007$), interpersonal support ($p = 0.031$), self-actualization ($p = 0.037$), and total lifestyle score ($p = 0.046$). These findings suggest that both interventions are effective in promoting a health-promoting lifestyle among middle-aged women. However, Transactional Analysis group therapy appears to be more effective in enhancing key components such as stress management, interpersonal relationships, and self-actualization.

Discussion and Conclusion

This study aimed to compare the effectiveness of Transactional Analysis (TA) group therapy and Protection Motivation Theory (PMT)-based intervention on promoting a health-enhancing lifestyle among middle-aged women (aged 40–60). The results indicated that TA group therapy was more effective than the PMT-based approach in fostering a health-promoting lifestyle in this population.

A review of previous studies revealed a lack of direct comparisons between TA and PMT in this context. While each approach has been individually studied across various domains, limited research has simultaneously evaluated both in relation to lifestyle promotion. TA has been widely recognized as an effective method in enhancing psychological well-being and healthy behavior. Studies suggest that TA can significantly improve interpersonal relationships and self-awareness, thereby contributing positively to both mental and physical health. For example, the conceptual model by Vos and van Rijn (2021) supports the role of TA in fostering interpersonal support and self-actualization,

although it emphasizes social aspects (Vos & van Rijn, 2021). Voss and van Rijn (2024) further highlight the effectiveness of TA in reducing depression and improving quality of life, which are closely linked to health-promoting behaviors (Vos & Van Rijn, 2024). Mazzetti (2020) demonstrated the utility of TA in stress management during public health crises, such as COVID-19 (Mazzetti, 2020). Kark (2016) found that participants in TA programs maintained long-term weight management (Kark, 2016), and Sepahpour (2022) showed improvement in life quality through TA (Sepahpour, 2022). Carter and Dalla (2006) emphasized the psychological health benefits of TA-based interventions (Carter & Dalla, 2006).

On the other hand, PMT has limitations that align with the findings of the present study. Rajendran and Shenbagaraman (2017) argued that PMT does not encompass all determinants of health behavior change (Rajendran & Shenbagaraman, 2017). Similarly, Ruiter (2016) noted that individuals may experience heightened anxiety when exposed to health-related threats, which could undermine behavioral change (Ruiter et al., 2014). Research by Khomkham et al. (2024) and Yao et al. (2021) also suggested potential limitations in the effectiveness of PMT (Khomkham et al., 2024; Yao et al., 2021).

TA focuses on both intra- and interpersonal change. It helps individuals become aware of their ego states, analyze social transactions, and identify recurring behavioral and cognitive patterns that impact their lives. For middle-aged women who face various physical and emotional challenges, TA group therapy can effectively support a healthier lifestyle (Leporati & Sills, 2011). A key mechanism in TA is the enhancement of the "ego states"—Parent, Adult, and Child—which influence daily behavior and thought. Women under social or family pressure may revert to dysfunctional Child states. TA helps them reinforce their Adult state, enabling logical and constructive decisions in everyday life (Lapworth & Sills, 2011). Another critical component is the resolution of psychological “games,” which are repetitive, unconscious interaction patterns that lead to dissatisfaction. TA teaches individuals to identify and interrupt these patterns, improving both mental and relational health (Erskine, 2015).

Furthermore, TA helps uncover and revise life scripts—unconscious behavioral blueprints developed in childhood. For middle-aged women, these scripts may lead to unhealthy behaviors. TA encourages script reformation toward healthier choices, supporting lifestyle improvements (Widdowson, 2018). Various studies support the effectiveness of TA in enhancing the quality of life and interpersonal functioning, which are crucial aspects of a health-promoting lifestyle. For instance, McLeod (2013) documented the success of TA in improving the quality of life for a woman with MS (McLeod, 2013). Leach (1998) showed that TA contributed to healthier eating and lifestyle habits among overweight women (Leach, 1998). These findings are aligned with the hypothesis of the present study.

Coulidge and Coulidge (2002) highlighted the theoretical foundation of TA and its benefits in facilitating the counseling process and improving interpersonal relationships. Improved communication has a positive impact on psychological health (Colledge & Colledge, 2002). Piccinino (2023) emphasized the role of TA group therapy in reducing stress, increasing self-awareness, and fostering self-acceptance (Piccinino, 2023). Morris et al. (2018) explored patient experiences with dietary counseling and concluded that relational and consultative styles significantly enhance health (Morris et al., 2018).

While PMT targets behavioral change by emphasizing fear and threat appraisal, it may not fully support lifestyle improvement. PMT’s mechanisms are based on individuals evaluating the severity and probability of threats, coping abilities, and perceived response costs. Although this model can initiate behavioral change, it may result in anxiety and less sustainable outcomes if not balanced with positive motivational elements. Rogers (1975) introduced PMT as a framework for fear-based behavior change, showing that fear can be a powerful motivator but may also provoke maladaptive responses (Rogers, 1975). Boer and Seydel (1996) noted that while PMT supports some health behavior changes, its impact on emotional and social dimensions may be limited (Boer & Seydel, 1996). Kim et al. (2022) found that hope and perceived benefits enhance the effectiveness of PMT (Kim et al., 2022). Tannenbaum et al. (2015) emphasized the need to combine fear with constructive strategies (Tannenbaum et al., 2015). Ruiter et al. (2014) cautioned that fear without actionable solutions may hinder improvements in health behavior (Ruiter et al., 2014). These findings collectively support

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the superior effectiveness of TA in promoting sustained lifestyle changes and holistic health.

Overall, TA group therapy offers a supportive environment that encourages middle-aged women—who often face hormonal, emotional, and social stressors—to adopt healthier behaviors. TA recognizes three functional ego states (Parent, Adult, Child) and allows participants to explore their emotional responses and decision-making processes. By identifying and modifying dysfunctional ego states and behavior patterns, women can replace negative habits with more constructive ones.

This study had several limitations that should be noted. Some participants had difficulty understanding the questionnaire items. The self-report nature of the instruments may have led to social desirability bias. The cross-sectional design limited the evaluation of long-term intervention effects. Confounding variables such as family support and stress levels were not controlled. Additionally, prior exposure to similar therapies and the study's limited geographic scope (Tehran) may reduce generalizability.

Future studies should incorporate structured training to reduce bias, utilize alternative tools such as interviews or observations to enhance data accuracy, and incorporate environmental and psychological moderators into the analysis. Practical recommendations include organizing workshops, individual counseling sessions, and support groups to promote lifestyle and mental health improvements for middle-aged women.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Declaration of Helsinki, which provides guidelines for ethical research involving human participants. Ethical considerations in this study included the fact that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

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