Original Article

Effects of Happiness on Psychological Capital in Middle-aged Women: A Randomized Controlled Trial

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Abstract

Aims: In middle age, women's psychological capital decreases. Happiness is one of the possible solutions to this problem. This study was designed to investigate the effect of happiness on the psychological capital of middle-aged women. **Materials and Methods:** The present study is a clinical trial study in which 60 middle-aged women participated through continuous sampling. The samples were divided into control and intervention groups by block randomization. The experimental group received group happiness training for 8 sessions of 90 min over 4 weeks. The control group did not receive any intervention. Psychological capital scores were measured at the beginning, end, and 4 weeks after the end of the study. The psychological capital questionnaire of McGee *et al*. and the background data questionnaire was used to collect information. Data were analyzed using SPSS software version 16. **Results:** The mean score of psychological capital at the beginning of the study in the two groups of intervention (100.615 ± 6.616) and control (104.9 ± 5.921) was not statistically significant. At the end of the intervention in the experimental group (146.154 ± 9.362) and the control group (109.700 ± 6.869) and 4 weeks after the intervention of the experimental group (129.423 ± 9.153) and the control group (110.700 ± 6.670), a statistically significant difference was observed ($P < 0.0001$). The difference between the scores of the two groups at the end and 4 weeks after the intervention in all dimensions of psychological capital (self-efficacy, hope, optimism, and resilience) was statistically significant. **Conclusions:** Health-care professionals can use group happiness training to increase the psychological capital of middle-aged women.

Keywords: Happiness, mental health, middle-aged women, psychological capital

Introduction

Middle adulthood encompassing the ages of 40–65 years is the largest and an important period in adult life.[1] Middle-aged individuals face numerous consequences as a result of their psychophysical and social changes.[2] The changes and complications caused by aging at this stage of life are more frequent in women than in men. Menopause and loss of fertility power constitutes the most critical issue faced by middle-aged women.[3] Menopause can pave the way for many psychological problems and reduce psychological capital.[4] As an indicator of positive psychology, psychological capital is characterized by features such as one's belief in their ability to succeed, perseverance in pursuing goals, creating positive evidence about oneself, and tolerating problems.[5] Psychological capital also affects attitudes, feelings, perceptions, behaviors, and mental health.[6,7] The components of psychological capital include hopefulness, resilience, optimism, and self-efficacy.[5]

Kolaei *et al*.[8] in Tehran, Iran, Jafari and Hesampour[9] in Kashan, Iran, Karami *et al*.[10] in Kermanshah, Iran, and Solhi *et al*.[11] in Chalus, Iran, reported unfavorable status of psychological capital and its components in middle-aged women.

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The strategies adopted to promote psychological capital in middle age include improving social capital,[12] yoga,[13] teaching positive thinking skills,[14] acceptance and commitment therapy,[15] promoting spiritual health, and mindfulness.[16] Happiness also appears effective in this regard and encompasses different meanings, including instant pleasure, long-term pleasure, and enjoying the whole life.[17] Research suggests happiness significantly affects mental health and yields proper behaviors and improved social relationships and interrelationships by affecting the components of social health.[18,19]

Given the contradictory results of the studies conducted on the effects of happiness on different dimensions of psychological capital[20-22] and their focus on adolescence[21] and old-age[20] rather than on middle-age as the vulnerable period, this cost-effective and side effect-free therapeutic method was used to conduct the present study and determine the effects of happiness on psychological capital in middle-aged women in Kashan, Iran.

Materials and Methods

This clinical trial was conducted between June and November 2020. The study population comprised middle-aged women presenting to comprehensive health centers in Kashan. The sample size calculated as 26 per group using the following equation and based on a test power of 80% and a confidence interval of 95% was ultimately determined as 30 per group given a dropout rate of 15%.[23]

$$n = \frac{\left(z_{1-\alpha/2} + z_{1-\beta}\right)^2 (\sigma_1^2 + \sigma_2^2)}{(\mu_1 - \mu_2)^2}$$

The inclusion criteria comprised willingness to participate in the study, an age of 40–65 years, residence in Kashan, Iranian nationality, ability to speak and hear, ability to communicate in Persian, absence of self-reported psychological disorders and mental retardation, receiving a score of below 112 out of 26-156 from the Psychological Capital Questionnaire developed by McGee *et al*.,[24,25] being physically able to attend all the sessions and no history of acute stresses in previous six months such as loss of loved ones and serious disorders in themselves or relatives. The exclusion criteria consisted of withdrawal from the study, being absent from more than two sessions, unavailability during the follow-up of psychological capital and facing acute stresses such as loss of loved ones and serious disorders in themselves or relatives during the study.

Sampling was then performed continuously in Moslem-ebn-Aghil and Imam Reza comprehensive urban health centers. The candidates who received a score of below 112 from the psychological capital questionnaire were included in the study.

Block randomization was used to assign the subjects to two groups. The blocks were divided into two groups based on a list extracted from www.sealedenvelope.com. Each group of blocks (3 blocks of 6 and 4) was randomly selected from one center. After identifying the group members using random allocation, the control group received routine health services for 4 weeks. A group happiness program was implemented in the intervention group in selected centers.

Two measurements was used in this study; 1-A 15-item demographic questionnaire comprising; age, spouse's age, marital status, occupation, spouse's occupation, level of education, spouse's education, number of female and male children, economic status, family structure (Who does she live with?), having known physical diseases, religious beliefs and family support status. The content validity of this instrument was confirmed by six faculty members of Kashan University of Medical Sciences, Kashan, Iran. 2-The 26-item Psychological Capital Questionnaire (McGee *et al*., 2011) were scored on a 6-point Likert scale ranging from 1 (completely disagree) to 6 (completely agree) for each item. The total score was 26–156, with higher scores denoting higher psychological capital levels.[24] Golparvar *et al*. confirmed the validity of this tool in Iran. They also confirmed the reliability of its subscales by calculating a Cronbach's alpha of 0.91 for self-efficacy, 0.89 for hope, 0.83 for resilience and 0.70 for optimism.[25] The present study also calculated a Cronbach's alpha of 0.63 for the whole instrument.

The intervention group participated in eight 90-minute sessions held twice a week at least every 2 days. The first author (master student of psychiatric nursing trained in happiness) designed this program based on Fordyce's protocol.[22] Every session began with discussing the activities and assignments of the previous session for 20 min. Happiness skills were then taught for 20 min, methods of using these skills in daily life were discussed for 40 min and assignments of the following session were specified during the final 10 min. Explanations were provided about follow-up (after one month) in the eighth session. The McGee psychological capital questionnaire was completed by the middle-aged women in the intervention group at the beginning of the first session, the end of the final session and 4 weeks after completing the program [zero, 1 and 2 point in Figure 1]. The questionnaire was completed simultaneously in the control group.

The data were analysed in SPSS-16 (SPSS Inc., IBM, USA) by blind analyser. Categorical variables were investigated in the two groups using the Chi-squared test and the Fishers exact test if necessary. Between-group analysis of the normally-distributed quantitative variables was performed using the independent *t*-test and that of the nonnormal data using the nonparametric Mann–Whitney U-test. Between-group and within-group analyses of psychological capital and its dimensions were also performed using repeated-measures ANOVA (In Between-group comparison, the variables of number of children, economic status and level of education were considered as Covariate.). Given the significant differences between the two groups in terms of number of children, economic status and education as

covariates, ANCOVA was performed to compare the two groups in terms of psychological capital and its dimensions.

The normality of the quantitative data was investigated using kurtosis and skewness taking ± 3 as normally distributed. $P < 0.05$ was set as the level of statistical significance in all the tests. The data were respectively analysed based on per-protocol and intention-to-treat (ITT) designs. Given the withdrawal in the 1st and 2nd weeks, replacement with baseline was performed in the ITT stage.

The approval of research was received from the research council (No: 98118; Registration: 1311/10/29/P) and Ethics Committee of Kashan University of Medical Sciences, Kashan, Iran (IR. KAUMS. NUHEPM. REC.1398.041). The present study was registered in the Iranian Registry of Clinical Trials (IRCT20100211003329N4). The participants were briefed on the study objectives and procedures, assured of the confidentiality of their data and their right to withdraw at their own discretion and finally signed written informed consent forms.

Results

Out of the 432 middle-aged women, 231 were ineligible and 159 were unwilling to participate in the study. This study was ultimately conducted in the intervention and control groups of 30 subjects each [Figure 2].

Statistically-significant differences were observed between the two groups in terms of economic status, level of education and number of children. No significant differences were, however, observed in terms of the other categorical variables and the mean score of psychological capital [Table 1]. Significant interactions were also observed between the time and the intervention (F = 57.085, $P < 0.0001$) [Figure 1].

Within-group analysis showed the significant effect of time in the intervention group (F = 287.100, $P < 0.0001$).

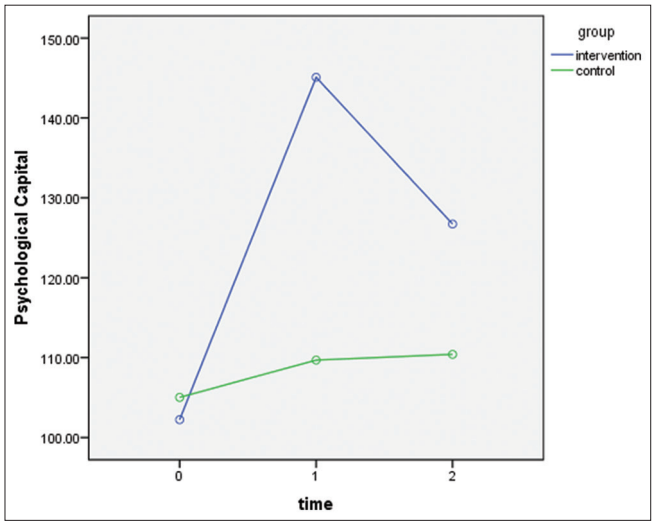

Figure 1: Effect of interactions between the study duration and group happiness on psychological capital

Significant differences were also observed in the total score of psychological capital between the beginning and end of the intervention ($P < 0.0001$), beginning of and 4 weeks after the intervention ($P < 0.0001$) and between the end of the intervention and 4 weeks afterwards ($P < 0.0001$). In the control group, the effect of time was significant during the study (F = 19.605, $P < 0.0001$) [Table 2].

Repeated-measures ANOVA was performed to investigate the effects of interactions the time and the intervention on different dimensions of psychological capital, i.e., self-efficacy, hope, optimism and resilience. Greenhouse and Geisser found these interactions to significantly affect self-efficacy (F = 12.800, $P < 0.0001$), hope (F = 12.008, $P < 0.0001$), optimism (F = 22.494, $P < 0.0001$) and resilience (F = 19.716, $P < 0.0001$). In the control group, the effect of time on the dimensions of; self-efficacy (F = 4.885, $P = 0.011$), hope (F = 8.74, $P < 0.0001$), optimism (F = 4.250, $P = 0.019$) and resilience (F = 3.961, $P = 0.023$) was significant. The ITT -based analysis supported all the findings of the per-protocol analysis.

Discussion

The present study was conducted in 2020 to determine the effects of happiness on psychological capital in middle-aged women in Kashan, Iran. The significant differences observed in the total mean score of psychological capital in the middle-aged women between the intervention and control groups at the end of and 4 weeks after the intervention demonstrated the effect of happiness on psychological capital. The ITT -based analysis also showed similar findings based on the per-protocol analysis.

These findings were consistent with those reported by some studies.[26-28] Happiness increased psychological capital by improving social health, behaviour, social relationships and interactions with others, purposefulness, satisfaction with life, self-esteem and quality of life.[18,29] The results also showed that in the control group there is a statistically significant difference between the total psychological capital score in the three time periods. In explanation the significance of the

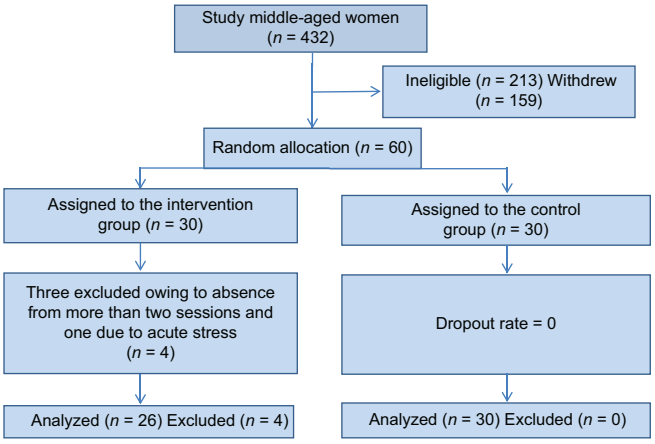

Figure 2: Sampling process

Table 1: Frequency distribution of demographic and personal information by group

Variable	Group (n=8; 30.8), frequency (%)		Test type and results (P)
	Intervention (n=26)	Control (n=30)	
Level of education			
Illiterate	0	3 (10)	0.024*
Primary school	14 (53.8)	13 (43.3)	
Junior high school	8 (30.8)	2 (6.7)	
High school diploma	2 (7.7)	8 (26.7)	
University	2 (7.7)	4 (13.2)	
Marital status			
Single	0	2 (6.7)	0.584*
Married	24 (92.3)	25 (83.3)	
Widowed	2 (7.7)	3 (10)	
Spouse's education level			
Control (n=25)			
Intervention (n=24)			
Illiterate	3 (12.5)	2 (8)	0.767*
Primary school	7 (29.2)	8 (32)	
Junior high school	4 (16.7)	7 (28)	
High school diploma	7 (29.2)	4 (16)	
University	3 (12.5)	4 (16)	
Occupation			
Retired	1 (3.8)	0	0.146*
Self-employed	1 (3.8)	5 (16.7)	
Housewife	23 (88.5)	21 (70)	
Employee	1 (3.8)	4 (13.3)	
Spouse's occupation			
Control (n=25)			
n=24 intervention			
Retired	11 (45.8)	9 (36)	0.056*
Self-employed	4 (16.7)	10 (40)	
Employee	2 (8.3)	1 (4)	
Farmer	0	3 (12)	
Manual worker	7 (29.2)	2 (8)	
Economic status			
Poor	1 (3.8)	4 (13.3)	0.025*
Moderate	22 (84.6)	15 (50)	
Good	3 (11.5)	11 (36.7)	
Family structure			
Living with spouse	5 (19.2)	3 (10)	0.754*
Living with children	1 (3.8)	3 (10)	
Living with spouse and children	18 (69.2)	21 (70)	
Living along	2 (7.7)	2 (6.7)	
Living with other relatives	0	1 (3.3)	
Level of family support			
Zero	2 (7.7)	3 (10)	0.078*
Low	2 (7.7)	0	
Moderate	11 (42.3)	5 (16.7)	
High	8 (38.8)	14 (46.7)	
Very high	3 (11.5)	8 (26.7)	
Having known physical diseases			
No	7 (26.9)	13 (43.3)	0.201**
Yes	19 (73.1)	17 (56.7)	
Religious beliefs			
Moderate	4 (15.4)	2 (6.7)	0.296*
High	11 (42.3)	9 (30)	
Very high	11 (42.3)	19 (63.3)	

Contd...

Table 1: Contd...

Variable	Group (n=8; 30.8), frequency (%)		Test type and results (P)
	Intervention (n=26)	Control (n=30)	
Variable	**Mean±SD**		**Test type and results**
	Intervention	**Control**	
Age (years)	50.962±6.999	50.967±7.398	0.998***
Spouse's age (years)	55.417±7.295	50.240±6.912	0.565***
Number of children	3.12±1.143	2.333±1.446	0.031***
Number of daughters	1.692±1.087	1.367±1.129	0.287***
Number of sons	1.423±0.945	0.967±0.809	0.057***
Total score of psychological capital at the beginning of the study (26-126)	100.615±6.616	104.900±5.921	0.241****
Score of self-efficacy (7-42)	27.692±2.895	29.367±3.068	0.709****
Score of hope (7-42)	26.269±2.864	26.533±3.550	0.430****
Score of optimism (6-36)	23.962±3.105	25.933±3.403	0.123****
Score of resilience (6-36)	23.038±1.536	23.067±3.279	0.674****

*Chi-squared/exact tests, **Chi-squared test, ***Independent *t*-test, ****ANCOVA. SD: Standard deviation, ANCOVA: Analysis of covariance

Table 2: Group-wise total score of psychological capital in the middle-aged participants on three occasions, Kashan, 2020

Total score of psychological capital (26-156)			Group, mean±SD		Test type and result		
			Control (n=30)	Intervention (n=30)	Interactions between study duration and group		Between-group analysis (P)
					Mauchly's test	Greenhouse-geisser test	
Beginning of the study (T1)			104.900±5.921	100.267±8.204	χ^2=14.250	F=26.437	0.336
4 weeks after beginning the study (end of the intervention) (T2)			141.200±15.606	109.700±6.869	P=0.001	P<0.0001	<0.0001
8 weeks after beginning the study (4 weeks after completing the intervention) (T3)			126.700±11.182	110.700±6.670			<0.0001
Test type and result							
The effect of time			F=19.605	F=287.100			
			P<0.0001	P<0.0001			
Within-group analysis	T1 and T2 difference	Bonferroni correction	P<0.0001	P<0.0001			
	T1 and T3 difference		P<0.0001	P<0.0001			
	T3 and T2 difference		P<0.0001	P=0.924			

*Repeated-measures ANOVA, **ANCOVA. SD: Standard deviation, ANCOVA: Analysis of covariance

effect of time in the control group, we can refer to sampling in covid-19 epidemic conditions. In addition to increasing stress, the covid-19 epidemic has faced the world with extraordinary crises and challenges and changes in life, which in addition to great stress and its consequences on physical and mental health, such as "social distance," "shelter in place" or staying at home and eventually it led to social isolation.[30] Social isolation,[31] poor quality of interpersonal relationships, and feelings of exclusion from society following the Corona epidemic can alleviate depression, anxiety, stress, and ultimately a decrease in psychological capital. Over time, by increasing awareness of methods of prevention, treatment and adaptation to the conditions of the people to some extent reduces anxiety and stress, and naturally the state of mental health and psychological capital can be improved.[32]

The happiness intervention was found to improve self-efficacy. The ITT -based analysis was similar to the findings based on the per-protocol analysis in all dimensions of psychological capital. Similarly, a study by Azarnia *e al*. showed the positive effect of happiness on beliefs in self-efficacy. As a source of optimistic trust in one's abilities, happiness promotes interactions between individuals and their environment.[21] Life management with beliefs in self-efficacy develops realistic expectations and positive thoughts about oneself and life events, whereas a lack of trust and confidence in one's abilities can create negative emotions.[33]

In the control group, the effect of time was significant and with the passage of time, the self-efficacy score of psychological capital improved. In critical situations of Corona epidemic, individual and social structures of life are disturbed, people feel that their control over the flow of life is reduced, and this situation leads to feelings of insecurity, increased anxiety and decreased self-efficacy,[34] But over time in social crises, negative factors such as anxiety have led to positive factors such as solidarity and social participation that positively affect mental health and increase self-efficacy.[35]

The present study found happiness to increase hope in the middle-aged women, which is consistent with the results of some studies.[20,36] Happiness develops positive and happy attitudes to life, positive behaviours and positive relationships with others and thus promotes life expectancy through substituting positive emotions for negative ones.[36,37]

In the control group, the effect of time was significant and with passing of time, the psychological capital score increased in the hope dimension. Coronavirus's critical condition may have threatened the mental health of people in the community and reduced life expectancy due to declining social relationships, job and financial problems, fear of illness and death,[38] But over time, critical situations give rise to new meanings in people's social lives that have either not existed before or have faded very little. In these circumstances, even the severance of social ties is considered a social action with a completely positive value that can increase happiness and life expectancy.[35]

The present findings suggested the effect of the happiness intervention on optimism in the middle-aged women. Similarly, Ahadi *et al*. reported relationships between happiness and optimism. The positive attitudes to events developed by happiness-induced changes in cognitive and emotional structures affect perception of the future.[22]

In the control group, the effect of time was significant and over time, the psychological capital score of the control group improved in dimension of optimism. During Covid-19 quarantine, support systems disintegrate, and social isolation can make individuals vulnerable to acute stress reactions, increasing negative emotions and sensitivity to social hazards, and decreasing positive emotions and optimism in the community.[31,39] Experts and pundits also believe that the psychological distress of the coronavirus pandemic may also disappear without intervention.[40]

This study found the happiness intervention to improve resilience in the middle-aged women, which is consistent with the finding obtained by Hashemi and Taheri in Chaharmahal and Bakhtiari Province, Iran.[41] Happiness improves emotion control skills such as resilience and tolerance to distress by reinforcing cognitive coping processes. Highly-resilient individuals maintain their psychological health in stressful and adverse situations.[42,43]

In terms of psychological capital resilience, the effect of time was significant in the control group, and with passing time, the resilience capital score improved. The emergence of covid-19 as an individual and social crisis and its rapid spread due to reduced social support in the early epidemic had negative effects on psychological hardiness.[44,45] But personal evolution that occur following social crises can lead to increased personal power or a sense of inner power which strengthens the sense of independence, self-confidence, positive thinking, problem-solving ability and resilience.[46]

Exchange information between the two groups outside the comprehensive health centers was out of researchers' control and was a limitation of the present research and the ITT analysis was its strength.

Conclusions

The present study found the happiness intervention to positively affect psychological capital and its dimensions, including self-efficacy, hope, optimism and resilience, in middle-aged women. It is recommended that healthcare providers, psychiatric nurses and mental health experts learn this method to improve psychological capital in middle-aged women and lower the burden of psychological disorders in this high-risk group.

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Conflicts of interest

There are no conflicts of interest.

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