

Effect of a 16-week Pilates exercise program on the ego resiliency and depression in elderly women

Su Yeon Roh*

Department of Exercise Rehabilitation and Welfare, College of Health Science, Gachon University, Incheon, Korea

This study aims to examine the effect of a 16-week Pilates exercise program on the ego resiliency and depression in elderly women. Before participating in Pilates exercise programs, researcher explained the purpose and the intention of the research to elderly women who were willing to participate in this research. A total of 148 elderly women agreed to participate in the program and they filled in ego resiliency and depression questionnaires. Then, the elderly participated in the 16-week Pilates exercise program and completed the same questionnaires afterwards. Collected data was analyzed by the SPSS ver. 20.0 program and results of paired *t*-test were as follows; there were statistically significant differences in all subvariables of the ego resiliency such as self-confidence ($t=7.770, P<0.001$), communication efficiency ($t=2.690,$

$P<0.01$), optimistic trait ($t=1.996, P<0.05$), and anger management ($t=4.525, P<0.001$) after elderly women participated in the 16-week Pilates exercise program, there was a statistically significant difference in depression of elderly women who participated in the 16-week Pilates exercise program ($t=-6.506, P<0.001$) which was statistically lower than before their participation in the program. Consequently, participating in the Pilates exercise program can help improve the ego-resiliency and alleviate depression of the elderly women.

Keywords: 16-Week Pilates exercise program, Elderly women, Ego resiliency, Depression

INTRODUCTION

According to an Organization for Economic Co-operation and Development report, the average life expectancy of Korean women is about 85 years old while the average of their male counterpart is 78 years old. It means women are likely to outlive men by over 7 years (Jeoung, 2015; Lee, 2015). The ballooning average life expectancy of women suggests they are relatively healthier than men, but it also means that they will have to endure more stresses and major changes in their lives in their old age. For example, women who usually outlive their male counterparts are exposed to more uncertainties, such as separation from their spouses by death, mourning the death of their colleagues, or being afflicted with age-related diseases.

Should they fail to adapt or respond to such environmental changes, they would experience various psychological symptoms

of maladjustment, such as anxiety or depression, or, in some serious cases, they might be tempted to commit suicide. Therefore, whether or not they would live a rich and happy life in their old age largely depends on how they could effectively control internal and external stresses from such difficult environments (Mehta et al., 2008; Smith, 2009).

While studying this perspective, it was discovered that ego resiliency is a very important concept for women in their old age. Wagnild (2003) defined ego resiliency as a positive psychological faculty that enables one to respond to different types of stress. Specifically, Felten and Hall (2001), Lamond et al. (2008), Resnick (2008), and Wagnild and Young (1990) observed that the elderly with a high ego resiliency (a) would maintain balanced views on their lives; (b) have a clear goal for their lives; (c) possess strong perseverance against ordeals; (d) demonstrate excellent capability to go through a particular difficulty; and (e) exhibit

*Corresponding author: Su Yeon Roh  <http://orcid.org/0000-0001-5573-5870>
Department of Exercise Rehabilitation and Welfare, College of Health Science,
Gachon University, 191, Hambangmoe-ro, Yeonsu-gu, Incheon 21936, Korea
Tel: +82-32-820-4254, Fax: +82-32-820-4449, E-mail: rsyopilates@naver.com
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strong self-confidence. Wagnild (2003) argued that the elderly with a high ego resiliency may experience relatively minimal depressive thoughts since they could skillfully control internal and external stresses, thereby enjoying productive elderly life. Thus, it signifies that the improvement of ego resiliency is most critical to reducing depressive thoughts that are emerging as one of the most serious social issues in their old age.

There are various methods to improve ego resiliency and reduce depressive thoughts, the most critical concept in old age, but the importance of diverse physical activities has been stressed recently (Brown et al., 2005; Childs and de Wit, 2014; Penedo and Dahn, 2005; Scully et al., 1998; Stathopoulos et al., 2006; Strawbridge et al., 2002). Specifically, Childs and de Wit (2014) reported that regular exercise contributed to strengthening the emotional resiliency of adults, while Brown et al. (2005) and Silveira et al. (2013) both reported that the more frequently one participated in regular physical activities, such as aerobic or muscular exercises, the less one would experience depressive thoughts. There have been little studies on the influence of low intensity physical activities, such as Pilates, which helps people use small, seldom-used muscles without moving their bodies actively and provides psychological stability through activities such as meditation on ego resiliency and depression of elderly women.

Therefore, this study aims to examine the effect of a 16-week Pilates exercise program on the ego resiliency and depression in elderly women. The specific research questions of this study are as shown: (a) Is there difference in the ego resiliency between before and after participation in the 16-week Pilates exercise program of elderly women? (b) Is there difference in the depression between before and after their participation in the 16-week Pilates exercise program?

MATERIALS AND METHODS

Research participants

For this research, a total of 150 female women aged over 60, which is defined as the elderly according to the Elderly Welfare Act in Korea, were sampled from Pilates programs run by a health and fitness center of Gachon University and a senior welfare center managed by Inchoen city. The participants were briefed on the content and the purpose of the research, and signed a consent form stating that they would participate in the research before the test began. Two of them were excluded from the test after stating that they would not participate in the test for personal reasons. Therefore, a total of 148 participants (66.3 ± 4.29) completed a

Table 1. The general characteristics of research participants

Characteristic	No. (%)
Age (yr)	
60–65	77 (52.0)
66–81	71 (48.0)
Education	
Middle school	48 (32.4)
High school	75 (50.7)
Beyond undergraduate level	25 (16.9)
Monthly allowance	
< KRW 300,000	21 (14.2)
KRW 300,000–400,000	34 (23.0)
KRW 400,000–500,000	54 (36.5)
> KRW 500,000	39 (26.4)

KRW, Korean won (the currency of the South Korea).

16-week intervention program for this research. The general characteristics of research participants are as shown in Table 1.

Research tool

Questionnaires were used to examine the effect of a 16-week Pilates exercise program on their ego resiliency and depression in elderly women.

Ego resiliency

The ego resiliency was measured by using 5-point Likert scale that developed by Klohnen (1996). The questionnaire on the ego resiliency test section was composed of questions on self-confidence (5 questions), communication efficiency (5 questions), optimistic trait (5 questions), and anger management (5 questions). The assessment is done by selecting from a Likert scale: “strongly agree (5 points) to strongly disagree (1 point)”, while the higher the overall reaction point is, the greater the ego resiliency is. The reliability was Cronbach $\alpha = 0.827$ – 0.880 which was reliable.

Depression

The Geriatric Depression Scale-Short Form, which was developed by Sheikh and Yesavage (1986), was used to measure depression. The responses to all items were made by the 5 Likert scale: “strongly agree (5 points) to strongly disagree (1 point)”. The reliability was shown as Cronbach $\alpha = 0.924$ which was very reliable.

Test procedure and Pilates program

This research is designed to examine the effect of the Pilates exercise program on ego resiliency and depression in elderly women. The research was performed for a period of 16 weeks in the health

Table 2. Pilates exercise program

Program	First program with mat (1st-8th weeks)	Second program with bands (9th–16th weeks)	Intensity	Frequency
Warming up (5 min)	Feel weight on feet	Breathing	6–8	3 times//week
	Knee bands, squat, rotations, side bends, roll downs, Breathing	Standing arm work band in hands Standing arm work from behind		
Main program (40 min)	Abdominal curls	Double leg stretch	6–8	3 times//week
	Baby swan	Hundred		
	Hip circles	Roll up		
	Hundred	Rolling like a ball		
	Pelvic clock	Saw		
	Pregnant cat	Side leg work		
	Roll up preparation	Single leg circles		
	Rolling like a ball	Single leg stretch		
	Side leg series	Spine stretch forward		
	Single leg kicks	Spine stretch side		
	Single leg stretch	Standing arm work-biceps curls		
	Small leg circles	Standing arm work-Deltoid lift		
	Spine stretch forward	Standing arm work-Overhead press		
	Spine stretch side	Standing arm work-Triceps press		
Cool down (5 min)	Toe taps	Swan	6–8	3 times//week
Cool down (5 min)	Hamstring stretch	Adductor stretch		
	Piriformis stretch	Abductor stretch		
	Quadriceps stretch	Hamstring stretch		

and fitness center of Gachon University and in the gym of a senior welfare center located in Inchoen city. The Pilates classes were led by 4 professional Pilates instructors (two instructor in each center respectively), while participants were advised to refrain from performing any other physical activity than the 16-week Pilates exercise program.

Before the commencement of the program, all participants were briefed on the purpose and the intention of the research, submitted signed consent forms and they filled in ego resiliency and depression questionnaires. The posttest was performed after the completion of the 16-week Pilates exercise program in accordance with the same manner as in the preliminary test.

In this research, the Pilates exercise program consisted of three sessions per week for a period of 16 weeks. Each session was again composed of a 5-min warm-up, a 40-min main program, and a 5-min cool-down. For the warming up and cooling down routines, static stretching was performed to relax muscles, while for the main program, Pilates moves were performed in sync with matching tunes. The main program of the Pilates class was divided into 6 to 8 subsessions in accordance with the ratings of perceived exertion (Kaesler et al., 2007; Pilates, 2001; Roh, 2016). The Pilates activity was composed mainly of two activities: 8-week Pilates mat exercises followed by 8-week band exercises.

The detailed program contents are shown in Table 2.

Research procedures and data analysis

The collected data were inputted to the computer and were analyzed by the IBM SPSS Statistics ver. 20.0 (IBM Co., Armonk, NY, USA). A descriptive analysis and reliability analysis were conducted to show general characteristics of participants and to verify reliability of the questionnaires respectively. The paired *t*-test was also conducted to analyze the differences between the pre and post-test. The level of significance was set as 0.05.

RESULTS

Differences in ego resiliency after the 16-week Pilates exercise program of elderly women

To analyze the difference in the ego resiliency of elderly women who participated in the 16-week Pilates exercise program, paired *t*-test was used. The results are shown in Table 3.

As shown in Table 3, there was a statistically significant difference in self-confidence, a subvariable of ego resiliency ($t=7.770$, $P<0.001$), which showed a dramatic increase in the posttest (4.16 ± 0.57) than in the pretest (3.57 ± 0.74). There was also a statistically significant difference in communication efficiency

Table 3. Difference in the ego resiliency between the pre- and posttest

Variable	Pre	Post	<i>t</i>	<i>P</i> -value
Self-confidence	3.57±0.74	4.16±0.57	7.709	0.000***
Communication efficiency	3.37±0.58	3.55±0.54	2.690	0.008**
Optimistic trait	3.45±0.73	3.61±0.64	1.996	0.048*
Anger management	3.13±0.83	3.53±0.68	4.525	0.000***

Values are presented as mean ± standard deviation.

P*<0.05. *P*<0.01. ****P*<0.001.

Table 4. Difference in depression between the pre and posttest

Variable	Pre	Post	<i>t</i>	<i>P</i> -value
Depression	2.86±0.52	2.50±0.46	-6.506	<0.001***

Values are presented as mean ± standard deviation.

****P*<0.001.

(*t* = 2.690, *P* < 0.01), with a steady increase in the posttest (3.55 ± 0.54) than in the preliminary test (3.37 ± 0.58). There was a statistically significant difference in optimistic trait (*t* = 1.996, *P* < 0.05), showing an increase in the posttest (3.61 ± 0.64) than in the preliminary test (3.45 ± 0.73). There was a statistically significant difference in anger management (*t* = 4.525, *P* < 0.001) with a vastly increase in the posttest (3.53 ± 0.68) than in the preliminary test (3.13 ± 0.83).

Differences in depression after the 16-week Pilates exercise program of elderly women

As shown in Table 4, there was a statistically significant difference in depression of elderly women who participated in the 16-week Pilates exercise program (*t* = -6.506, *P* < 0.001). More specifically, depression of elderly women dramatically decreased in the post test (2.50 ± 0.46) than in the preliminary test (2.86 ± 0.52).

DISCUSSION

This study examined the effect of a 16-week Pilates exercise program on their ego resiliency and depressions in elderly women. This chapter will be dedicated to an in-depth discussion of the results.

An analysis of the difference in ego resiliency before and after participation in the 16-week Pilates program of elderly women, the primary participant of this study, shows that there are statistically significant differences. Self-confidence, communication efficiency, optimistic trait, and anger management, all of the subvariable consisting of the ego resiliency of elderly women who participated in the 16-week Pilates exercise program, have been improved, compared to their condition before the participation in the Pilates exercise program. To sum it up, these elderly women

responded better to impending challenges with confidence, and communicated with other people more positively than they did before their participation in the program. Furthermore, their capability to respond to a situation in an optimistic light and their ability to control anger improved after their participation in the program, suggesting that such changes are stemming from the unique characteristics of Pilates, namely, that Pilates can contribute to improve emotional competence as well as physical capability unlike other exercises, and such objective of Pilates has improved the self-confidence, communication efficiency, optimistic trait, and anger management of the participants, all of which are elements of ego resiliency (Campos de Oliveira et al., 2015).

Second, the difference in depression of elderly women before and after their participation in the 16-week Pilates program was indeed confirmed. The perceived geriatric depression of the participants dropped after their participation in the 16-week Pilates program, suggesting that Pilates contributes to lowering geriatric depression frequently observed among the elderly by decreasing stress levels stemming from their own state of health or other external factors. Such an outcome points out that Pilates, which is defined as a slow exercise, provides a psychologically positive and calming effect. In the same vein, Mokhtari et al. (2013) reported that a 12-week Pilates activity contributes to reducing geriatric depression among the elderly, confirming the conclusion of this study.

It should be noted that the physiological and emotional roles inherent in Pilates exercises are critical in raising the ego resiliency of elderly women and in alleviating depression. Therefore, this study would be a key data in supporting the importance of Pilates among elderly women who are in need of physical and psychological attention.

This study would contribute to an extent to resolving diverse potential issues that are happening at the national level by surveying the effectiveness of the Pilates program on numerous issues that could occur to female elders who are enjoying relatively longer life expectancies.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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