

Physical self-concept and life satisfaction among middle-aged and senior population participating in table tennis

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Abstract: The purpose was to explore the impact of participation in table tennis on physical self-concept and life satisfaction of middle-aged and senior citizens. 211 participants (99 males and 112 females, over 40 years old) from metropolitan area and contestants from the 2009 Taiwan Evergreen Table Tennis Championship were surveyed. All participants were administered the physical self-concept inventory and the life satisfaction inventory. Results showed that: 1. table tennis participants have a significantly higher life satisfaction and physical self-concept than non-exercisers; 2. a significantly positive relationship was found between table tennis participation and overall physical self-concept; 3. no significant differences were found in life satisfaction with regard to participants of different gender and age; 4. a significant difference was found in physical self-concept among participants according to gender while no significant difference was found in physical self-concept according to age.

Key Words: physical activity, self-concept, life satisfaction, aging

1. INTRODUCTION

With the development of human civilization, public health and medical technology, human mortality rate has gradually declined and the average life span has increased. However, due to a change in social values, birthrate is also gradually declining, which speeds up the coming of aging society. Therefore, population aging has become a global trend and is raising concern in all sectors of the society. In the field of gerontology, scholars are endeavoring to discover the factors relevant to the life satisfaction of the elderly in order to assist them in adapting to their late life. Consequently, the primary research question of this study was to investigate whether participation in table tennis can affect the life satisfaction of the elderly.

Moreover, many studies have indicated that establishing a habit of regular exercise and improving physical fitness are important strategies for improving the health status of the elderly, slowing down the aging process as well as preventing and alleviating chronic illness [1]. Although the relationship between physical self-concept and level of participation in sports or exercise has been investigated in children and adolescents in Taiwan, there are only few studies concerning the middle-aged and the elderly. Therefore, the second research question of this study was to further understand the relationship between table tennis participation in the elderly and their physical self-concept.

In studies concerning sports and social psychology, age and gender are important variables. For example, many studies on physical self-concept and life satisfaction also found that age and gender have a significant effect on physical self-concept. However, no consistent conclusions regarding the relationship between the gender and life satisfaction of the elderly have been reached [2-3]. Therefore, the third research question of this study was to investigate whether age

and gender moderate the relationship between middle-aged table tennis participants and their physical self-concept and life satisfaction. We expected that table tennis participants would score higher in the scales of life satisfaction and physical self-concept than that of non-exercisers, and age and gender might moderate these relationships.

2. METHOD

2.1 Subjects

This study used purposeful sampling to conduct a questionnaire survey on male and female middle-aged and elderly members of the population who are vendors and consumers in the traditional market, as well as the male and female contestants aged 40 years and above from the 2009 Taiwan Evergreen Table Tennis Championship. A total of 250 questionnaires were distributed. After 39 invalid questionnaires were excluded, there were a total of 211 valid questionnaires, with a return rate of 84%.

2.2 Research tools

2.2.1 Basic information

The basic information gathered gender, date of birth, participation/non-participation in fitness programs, average number of weekly exercise (less than 1, 1, 2, 3, 4, 5, and above), average duration of exercise (less than 30 minutes, 30 minutes to 1 hour, 1 to 2 hours, 2 to 3 hours, and more than 3 hours), intensity of physical activity (mild exercise: exerciser can speak and sing loudly; adequate exercise: exerciser can speak and sing; moderate exercise: exerciser can speak normally but fails to sing; somewhat strenuous exercise: exerciser can neither speak nor sing; extremely strenuous exercise: exerciser breathes heavily and finds it a bit difficult to breathe) [4].

2.2.2 Physical self-concept scale

The scale developed by Liou [5] included six dimensions in physical self-concept (i.e., physical self-perception, exercise performance, figure, health, flexibility, endurance, and strength). The main purpose of using this scale was to understand the physical self-concept of middle-aged and elderly people in Taiwan. Cronbach's α coefficients, ranging from 0.78~0.86, revealing the reliability of the scale, and factor loadings for all of questions were greater than 0.60, revealing the scale's high validity. The total variance explained was 66.1%.

2.2.3 Life satisfaction scale

The scale developed by Wang [6] included two factors: (1) Life anxiety: the subject's subjective assessment on his/her life and his/her level of life anxiety; and (2) Current satisfaction: the subject's assessment on his/her current status, subjective opinion on life, and level of satisfaction with current status. The internal consistency of the scale as assessed by Cronbach's α was 0.62 for life anxiety and 0.69 for current satisfaction, revealing an acceptable reliability of the scale. After Varimax rotation was performed, the total variance explained was 46.1%, revealing an acceptable factor validity of the scale.

2.2.4 Data processing and statistical analysis

Independent samples t-tests were used to analyze the difference in life satisfaction between the middle-aged and elderly table tennis participants and non-exercisers, and for the difference in physical self-concept between the different groups.

The Spearman rank-order correlation coefficient was used to analyze the correlation between table tennis participation and physical self-concept. An independent-samples t-test was used to analyze whether gender and age affect the life satisfaction and physical self-concept of the middle-aged and the elderly participating in table tennis. The level of significance was set as $p = 0.05$.

3. RESULTS and DISCUSSION

3.1 The difference in life satisfaction between table tennis participants and non-exercisers

Compared to non-exercisers, table tennis participants exhibited lower life anxiety, higher current satisfaction, and higher life satisfaction ($p < 0.001$). Although the cross-sectional nature of the current study precluded its causal inference, it is possible that exercise enables the middle-aged and the elderly to maintain good quality of life, improve psychological health, and reduce pressure, muscle tension, self-anxiety, and depression, which in turn has a positive effect on life satisfaction, sense of happiness, and quality of life.

3.2 The difference in physical self-concept between table tennis participants and non-exercisers

There was a significant difference in physical self-concept between the middle-aged and elderly table tennis participants and the non-exercisers ($p < 0.001$). The differences were highlighted in six aspects, namely: exercise performance ($p < 0.001$), figure ($p < 0.001$), health ($p < 0.001$), flexibility ($p < 0.001$), endurance ($p < 0.001$), and strength ($p < 0.001$), as shown in Table 1. As opposed to the middle-aged and the elderly who did not participate in table tennis, those who participated had a higher physical self-concept and were more satisfied with their exercise performance, health, and figures.

Table 1. The physical self-concept between table tennis participants and non-exercisers.

Variable	Group	Number	Mean	SD	t-value	p-value
physical self-concept	non-exercisers	102	2.18	0.38	-17.61*	.000
	table tennis	109	3.35	0.55		
exercise performance	non-exercisers	102	2.07	0.39	-22.26*	.000
	table tennis	109	3.66	0.61		
figure	non-exercisers	102	2.34	0.51	-11.13*	.000
	table tennis	109	3.40	0.81		
health	non-exercisers	102	2.37	0.62	-13.39*	.000
	table tennis	109	3.54	0.64		
flexibility	non-exercisers	102	2.26	0.43	-10.83*	.000
	table tennis	109	3.19	0.74		
endurance	non-exercisers	102	1.86	0.44	-12.62*	.000
	table tennis	109	2.86	0.67		
strength	non-exercisers	102	2.21	0.50	-13.40*	.000
	table tennis	109	3.25	0.61		

* $p < 0.05$

3.3 The relationship between table tennis participants and physical self-concept in the middle-aged and elderly

The Spearman rank-order correlation coefficient was used to analyze the relationship between physical self-concept and table tennis participation in middle-aged and elderly subjects. The results indicated that there was a significantly positive correlation between participation in table tennis and physical self-concept ($p = 0.02$) for the middle-aged and the elderly. Regarding the 6 subscales of physical self-concept, there was a significantly positive correlation between participation in table tennis and exercise performance ($p = 0.02$), figure ($p = 0.02$), endurance ($p = 0.03$), and strength ($p = 0.03$) of the middle-aged and the elderly. This is consistent with the findings of Fox [7]. Thus, encouraging middle-aged and elderly individuals to participate in fitness programs such as table tennis and to increase their frequency of exercise could be beneficial to their physical self-concept.

3.4 Comparison of the effect of gender and age on life satisfaction in middle-aged and the elderly table tennis participants

The results of the t-test indicated that gender did not significantly affect the overall score of the life satisfaction scale ($p = 0.41$) and the subscale of current satisfaction ($p = 0.19$) in the middle-aged and elderly

table tennis participants, although gender significantly affected the subscale of life anxiety ($p = 0.01$). Therefore, it may be inferred that gender doesn't have much effect on the life satisfaction of the middle-aged and elderly table tennis participants.

Regarding the response of different age groups and their response to life satisfaction, the middle-aged and elderly participants were divided into two groups; there were 54 subjects aged 40-59 and 55 subjects aged 60-79. As shown in Table 2, the results of the t-test indicated that age did not significantly affect the overall score of life satisfaction ($p = 0.28$), the subscale of current satisfaction ($p = 0.28$), or the subscale of life anxiety ($p = 0.43$) of the middle-aged and elderly table tennis participants. It can be inferred that age did not significantly affect the life satisfaction of middle-aged and elderly table tennis participants, which is inconsistent with the hypothesis.

However, age significantly affected the life satisfaction of the middle-aged and the elderly who did not participate in a fitness program ($p = 0.02$). Age affected life anxiety ($p = 0.00$) but had no effect on current satisfaction ($p = 0.89$). Thus, it can be inferred that a decrease in life satisfaction results in those who do not regularly exercise and reduces participation in economic and social activities with their increase in age, as well as resulting in the increase of life anxiety.

Table 2. Life satisfaction for different ages

Variable	Age	Number	Mean	SD	t-value	p-value
life satisfaction	40-59	54	3.96	0.48	1.08	.28
	60-79	55	3.88	0.30		
life anxiety	40-59	54	2.04	0.57	-0.77	.43
	60-79	55	2.12	0.48		
current satisfaction	40-59	54	3.97	0.51	1.06	.28
	60-79	55	3.88	0.35		

* $p < 0.05$

3.5 Comparison of gender and age effects on physical self-concept in middle-aged and elderly table tennis participants

The male subjects had a higher physical self-concept than the female subjects. In the 6 subscales, except for flexibility, the performance of the male subjects was higher than in the females. As shown in Table 3, gender significantly affected the physical self-concept, figure, endurance, and strength of the middle-aged and the elderly participants. In addition, there were significant differences in figure, endurance, and strength between male and female subjects.

As for the comparison of different age groups and their response to physical self-concept, the participants were divided into two groups: 54 subjects aged 40-59 and 55 subjects aged 60-79. The results of the t-test indicated that age did not significantly affect the physical self-concept of the participants ($p = 0.18$). For the 6 subscales, age did not significantly affect exercise performance ($p = 0.64$), figure ($p = 0.71$), health ($p = 0.21$), endurance ($p = 0.21$), or strength ($p = 0.26$), but age significantly affected flexibility ($p = 0.02$). It could thus be inferred that age did not affect the physical

self-concept of the middle-aged and elderly participants, which is also inconsistent with the hypothesis.

Table 3. The effects of gender on physical self-concept of the middle-aged and elderly participants (n=109)

Variables	Gender	Number	Mean	SD	T value	P value
Physical self-concept	M	53	3.46	0.47	1.96	.05
	F	56	3.25	0.61		
Exercise performance	M	53	3.66	0.51	0.15	.87
	F	56	3.65	0.69		
Figure	M	53	3.56	0.74	2.01	.04
	F	56	3.25	0.86		
Health	M	53	3.64	0.54	1.58	.11
	F	56	3.45	0.72		
Flexibility	M	53	3.18	0.65	-0.0	.98
	F	56	3.19	0.83		
Endurance	M	53	3.09	0.53	3.67	.00
	F	56	2.64	0.72		
Strength	M	53	3.44	0.45	3.29	.00
	F	56	3.07	0.69		

* $p < 0.05$

3.6 Practical suggestions

3.6.1 Fitness education programs should be promoted as early as possible

The results indicated that the life satisfaction of the middle-aged and the elderly table tennis participants was quite high and their physical self-concept could be improved. Improvement in physical self-concept increased an individual's self-confidence and also indirectly increased the level of participation in table tennis, which indicates a mutually beneficial relationship. Exercise participation extended with progress in life development. Table tennis is beneficial to the middle-aged and the elderly. From the perspective of continuum theory, a satisfactory senior life cannot be achieved unless the elderly already begin to maintain their habits or custom when middle aged. However, with an increase in age, it is difficult to begin participating in a new activity, or to replace the activity originally involved in with a new one. Table tennis includes the comprehensive development of intelligence and physical ability. It is hoped that table tennis may cultivate students' habit of regular exercise with the support of schools. It is necessary to cultivate citizens' skills and exercise habits as early as possible, in order to attract the middle-aged and elderly to participate in table tennis, increase their physical self-concept and life satisfaction, and allow them to view table tennis as a part of senior life.

3.6.2 To combine civil groups and relevant units to promote the participation of fitness program by the middle-aged and the elderly

Recent studies have indicated that regular exercise can effectively prevent and alleviate the occurrence of chronic diseases, increase physical health, increase physical fitness, and increase positive emotions. In order to strengthen citizens' knowledge and understanding about the positive effects of exercise on mental and physical health, it is necessary to provide middle-aged and elderly individuals with accurate exercise methods and options, and to encourage them to engage in regular fitness programs. The elderly continuously participate in fitness programs to improve

their physical fitness, adaptation to life, and level of physical activity when they perceive that exercise is beneficial to mental health. Therefore, it is important to combine civil groups with relevant units to provide the middle-aged and the elderly with diversified community exercise-related information and opportunities, to increase the visibility of information concerning the benefits of exercise, and to use mass media to promote physical health-related knowledge. As long as the habit of regular exercise is cultivated, they are less likely to suffer from chronic illness in the rest of their lives, and their quality of life may be further improved.

4. CONCLUSION

The middle-aged and the elderly table tennis participants exhibited higher life satisfaction and better physical self-concepts. These results indicate that participating in table tennis may benefit the psychological well-being of elderly individuals. As such, the development of table tennis programs for senior population in particular should be encouraged.

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