

Effect of swimming exercise in old age on hopelessness and depression levels

Hande Baba Kaya

Department of Physical Education and Sports Education, Faculty of Sport Sciences, Düzce University Düzce, Turkey.

ABSTRACT

The aim of this study is to analyze the effects of 12 weeks swimming exercise on the levels of hopelessness and depression in women aged over 55. This study is constructed by considering the period of hopelessness emerging as a part of self-integrity seen as the last step of psychosocial development theory; the levels of hopelessness and depression levels of 40 women were included. The Beck Depression and Hopelessness Scale were used to determine the level of hopelessness and depression of the participants. Participants with high were divided into two groups by random assignment method, while one group was given swimming exercise for 12 weeks, no application was made to the other group. Swimming exercise was applied to the experimental group for 12 weeks 3 days a week. The data of the research were evaluated in SPSS 22 package program. In order to determine whether the difference between the two related samples is significant, the t-test was used for the analysis of the data. When analyzing the results, significant reduction in depression and hopelessness levels of women over 55 was observed after 12 weeks of swimming exercise.

Keywords: Swimming exercise, depression, hopelessness, old age.

E-mail: handebabakaya@duzce.edu.tr.

INTRODUCTION

Erikson, one of the psychoanalytic theorists, talks about the psychological effects of social processes in the development process. Advocating that development continues from birth to death, Erikson argues that a single part of life is never more important or critical than any other part of life. Erikson says that in each period of human development there is a certain problem of its own. There is a psychosocial crisis in every period of life. Erikson divides life into eight developmental periods, the last period of human life, in which the participants call hopelessness against self-integrity, is the last period of psychosocial development and is composed of people in the period of maturity. During this period, people look back and evaluate the choices they made, review their successes and failures. In this review process, if a person reaches the conclusion that his/her life is full of successes and has spent a meaningful life, the result is a sense of self-integrity, but if the person is unhappy with the choices he/she made, the feeling of hopelessness emerges as a result of thinking that his/her life is wasted and it is too late for everything (Ulusoy, 2006; Burger,

2006).

Hope is the expectation to achieve future goals (Rideout and Montemuro, 1986; Tiryaki, 2020). Hopelessness is the lack of prospects for the future (Melges 1969). Underneath the emergence of these two opposite states of emotions lies the belief that expectations for life will come true. This is exactly what happens during the period of hopelessness against self-integrity, which Erikson calls the period of maturity, which is over 55 years old. The person experiences a feeling of hopelessness with a sense of unhappiness that is given by the inability to fulfil their expectations for life. Most often hopelessness is also considered a sign of depression (Melges, 1969; Dilbaz and Seber, 1993). Depression is characterized by inability to enjoy activities in life and state of unhappiness, hopelessness for the future, decrease in energy and concentration, over-sleep and loss of self-care skills (APA, 2013). In many studies conducted in people in maturity, mental problems including dementia, depression, alcohol abuse and suicide attempts have come to the fore (Beğler and

Yavuzer, 2012). The depression experienced in this age period leads to social isolation and a decrease in quality of life (Eker and Noyan, 2004).

Swimming exercise affects the psychological development of a person as well as physiological development (Sönmez, 2020). Swimming is a sport against water resistance, so it is a sport in which all body muscles are used. Therefore, it has significant positive effects on muscle strength and overall resistance. Swimming is a fairly good form of exercise for the elderly (Wong et al., 2011). Swimming exercise reduces stress, increases one's self-confidence and gives a feeling of relaxation. It is also known that swimming in the elderly has a soothing and calming effect (Sofi et al. 2011). According to the results of studies on both humans and animals, there are studies that claim physical exercise supports the cognitive functions in a positive sense (Yau et al., 2016), as well as emotional (Kolb, 2003) and behavioural responses (Budde, 2016). In this sense, the aim of this study is to provide a decrease in the level of hopelessness and depression with swimming exercise for women aged 55 and above.

METHODOLOGY

In this study, screening and experimental research patterns reflecting the assumptions of post-positivist philosophy based on quantitative methods were used. The scanning pattern allows quantitative or numerical description of the trend, attitudes or views across a universe through studies on a sample selected from within a universe, so that the researcher makes inference about the sample. In this study, the purpose of the use of screening patterns is that the levels of hopelessness and depression of the participants were determined by this method. This method is an advantageous method in terms of rapid data collection, economy, and also determining the characteristics of a large universe by using a small number of individuals (Creswell, 2016). In the experimental phase of the study, the results of the sample defined can be generalized to the universe, but the main purpose of the experimental pattern is to test of the effects of the operation or intervention on the outcome by controlling the factors that might affect the results of the experiment. The way to control the external factors is to assign participants to random groups by the researcher. One of the groups was included in experimental processing, while the other was not included so that the researcher could determine whether the impact on the result is caused by external factors or experimental processing. In this study, pretest-posttest pattern with control groups was used, which is known as real experimental pattern as part of experimental operations. This is a traditional pattern that includes participants in groups created by random assignment pattern. Each group is given pretest-posttest, but experimental processing is performed only to

experimental groups (Creswell, 2016).

Study group

The study group consists of 40 women over 55 years of age. Participants who scored higher from the Beck Depression Scale and Beck Hopelessness Scale out of 184 people wishing to participate in the study announced through social media were included in the study. The study was limited to the Ereğli district of Zonguldak province on grounds of feasibility of the experimental study. A private swimming pool was rented for 1 hour 3 days a week by the researcher and swimming practice were made for 12 weeks. The group of 40 participants was divided into two groups by random assignment method, 20 people experimental group and a control group of 20 people. Upon completion of the applications, final measurements were taken. Pretest-posttest measurements were encoded to the computer via a code directive prepared by the researcher. SPSS 22 package programs were utilized in encoding and analysis. The data obtained are interpreted within the framework of critical perspective and scientific knowledge.

Data collection tools

Personal information form

In this form, participants were asked about personal information such as income levels, socioeconomic levels they perceive, educational status, employment and with whom they live.

Beck hopelessness scale

The Beck Hopelessness Scale (BHS) was developed by Beck et al. The validity and reliability study in Turkish was conducted by Durak and Palabıyıköğlü (1994). The scale consists of 20 items. The lowest score from the scale is "0" and the highest score is "20". According to the scores from the Beck Hopelessness Scale, the total score of 0-3 is normal, the total score of 4-8 is mild hopelessness level, 9-14 is average level of hopelessness and 15 and above is defined as the intense level of hopelessness.

BECK depression inventory

BECK depression inventory (BDI) was created by Beck et al. (1979). Turkish adaptation of the inventory was done by Hisli (1988). BDI consists of 21 items. Each item is scored between 0 and 3. The highest score that can be obtained from the inventory is 63 (Savasir and Şahin, 1997). High score indicates an excess of the severity of depression. The cutting score of the scale was

determined as 13 in social studies and 21 in clinical trials (Beck and Beamesderfer, 1974). The average cutting score is 17 and the score of over 17 is 90% accurately reveals the presence of depression at the level that would make treatment necessary (Hisli, 1988). BDI is evaluated based on total score; according to this, 0-9 refer to "no depression", 10-16 to "mild depression", 17-29 to "moderate depression" and 30-63 indicates "severe depression" (Kılınç and Torun, 2011).

Data analysis

In order to determine the tests to be used in the analysis of the data collected within the scope of the study, it was examined whether the scores of the experimental and control group participants from the Beck Depression Scale and Beck Hopelessness Scale meet the necessary prerequisites in order to determine the suitability for the use of parametric tests. The skewness and kurtosis

values of the pretest and posttest scores were examined and shown in Tables 1 and 2.

In Tables 1 and 2, the skewness and kurtosis values of the scales used in the research is less than 50 people (Buyukozturk, 2014: 42) and for this reason they were examined by Shapiro-Wilk test. The skewness and kurtosis values of scales and sub-scales are found to be among the values of +2.0 and -2.0, which is accepted for the social sciences (George and Mallery, 2010). In this sense, the use of parametric tests was found appropriate in the research. In order to determine whether the difference between the two related samples is significant, the T-Test was used for the analysis of the data of the research.

In addition, frequency, percentage and average analysis were utilized in the analysis of the demographic information of the participants. Statistical analysis was calculated through SPSS 22 (Statistical Package for Social Sciences) package program, and error margin in the statistical analysis was taken as $p < .05$.

Table 1. Shapiro-Wilk normality test results applied to points from beck depression scale pre-test and post-test measurements of control and experimental groups.

Groups	Measurement	n	W	Skewness	Kurtosis	p
Control group	Pre-test	20	.897	-.055	-1.601	.036
	Post-test	20	.924	-.778	.000	.118
Experimental group	Pre-test	20	.968	.445	-.086	.711
	Post-test	20	.948	.048	-1.101	.338

Table 2. Shapiro-Wilk normality test results applied to points from Beck hopelessness scale pre-test and post-test measurements of control and experimental groups.

Groups	Measurement	n	W	Skewness	Kurtosis	p
Control group	Pre-test	20	.858	-.620	-.873	.007
	Post-test	20	.704	-1.121	-.281	.000
Experimental group	Pre-test	20	.863	.004	-1.511	.009
	Post-test	20	.959	.135	-.511	.522

FINDINGS

Descriptive statistics of experimental and control groups

As shown in Table 3, when descriptive data of the income level variable is examined, 50.0% of participants in the control group are at 0-2000 TL level ($n = 10$) and 50.0% 2001-4000 TL ($n = 10$). In the experimental group, 20.0% of the participants have income levels of 0-2000tl ($n = 4$), 60.0% 2001-4000tl ($n = 12$) and 20.0% 4001tl and more ($n = 4$).

As shown in Table 4, analyzing descriptive data of the perceived income level variable; 60.0% of the participants in the control group perceive their income levels as good ($n = 12$) and 40.0% moderate ($n = 8$). In the experiment group, 35.0% of the participants perceive their income levels as good ($n = 7$), 5.0% moderate ($n = 1$) and 60.0% bad ($n = 12$).

As shown in Table 5, when descriptive data on the perceived education status variable, it is seen that 45.0% of the participants in the control group graduated from primary school ($n = 9$) and 55.0% from high school ($n = 11$). In the experimental group, 30.0% of the participants

Table 3. Descriptive statistical data on income level variable of experiment and control groups.

Income level		Control	Experiment
0-2000 TL	Frequency	10	4
	Percent	50.0%	20.0%
2001-4000 TL	Frequency	10	12
	Percent	50.0%	60.0%
4001 TL and more	Frequency	0	4
	Percent	0.0%	20.0%
Total	Frequency	20	20
	Percent	100.0%	100.0%

Table 4. Descriptive statistical data on perceived income level variable of experiment and control groups.

Perceived Income level		Control	Experiment
Good	Frequency	12	7
	Percent	60.0%	35.0%
Average	Frequency	8	1
	Percent	40.0%	5.0%
Bad	Frequency	0	12
	Percent	0.0%	60.0%
Total	Frequency	20	20
	Percent	100.0%	100.0%

Table 5. Descriptive statistical data on education status variable of experiment and control groups.

Education status		Control	Experiment
Elementary school	Frequency	9	6
	Percent	45.0%	30.0%
High school	Frequency	11	14
	Percent	55.0%	70.0%
Total	Frequency	20	20
	Percent	100.0%	100.0%

graduated from primary school (n = 6) and 70.0% from high school (n = 14).

As shown in Table 6, when descriptive data of the perceived employment state variable is examined; 60.0% of the participants in the control group are employed (n = 12) and 40.0% are unemployed (n = 8). In the experimental group, 35.0% are employed (n = 7) and

65.0% are unemployed (n = 13).

As shown in Table 7, analyzing descriptive data about who the participants live with; 60.0% of the participants in the control group live with spouse (n = 12), 35.0% alone (n = 7), 5.0% live with children (n = 1). In the experimental group, 30.0% live with their spouse (n = 6), 30.0% alone (n = 6) and 40.0% with their children (n = 8).

Table 6. Descriptive statistical data on employment status variable of experiment and control groups.

Employment status		Control	Experiment
Employed	Frequency	12	7
	Percent	60.0%	35.0%
Unemployed	Frequency	8	13
	Percent	40.0%	65.0%
Total	Frequency	20	20
	Percent	100.0%	100.0%

Table 7. Descriptive statistical data on whom experiment and control groups live with.

With whom they live		Control	Experiment
With spouse	Frequency	12	6
	Percent	60.0%	30.0%
Alone	Frequency	7	6
	Percent	35.0%	30.0%
With children	Frequency	1	8
	Percent	5.0%	40.0%
Total	Frequency	20	20
	Percent	100.0%	100.0%

Table 8. T-test results for pre-test and post-test scores of Beck depression measurements of participants in the control and experiment groups.

Groups	Measurement	n	X	S	sd	t	p
Control group	Pre-test	20	44.55	6.57	19	1.96	.064
	Post-test	20	40.75	10.42			
Experimental group	Pre-test	20	45.30	5.77	19	15.10	.000
	Post-test	20	35.10	4.29			

Findings related to research experiments

In this section, the findings of statistical analysis applied to test the experiments for the purpose of the research are included. The aim of the research is to analyze the effects of swimming exercise on levels of depression and hopelessness. In accordance with this purpose, as a result of the application in groups determined unbiased within the scope of the experimental study, pre-test and post-test of control and experimental groups to test the effectiveness of the application scores are shown with tables examined by t-test analysis for related samples.

When examining Table 8, it was found that there was a significant decrease in depression levels of individuals

participating in swimming exercise, $t(19) = 15.10$, $p < .01$ decreased from $X = 45.30$ to $X = 35.10$ after swimming exercise. This finding indicates that swimming exercise has a significant effect on reducing depression levels in women over 55 years of age.

When examining Table 8, there is no significant difference between pre-test and post-test values of depression levels of the control group with whom no application is performed.

When examining Table 9, it was found that there was a significant decrease in the level of hopelessness of individuals participating in swimming exercise, $t(19) = 15.59$, $p < .01$ points decreased to $X = 9.20$ after swimming exercise, while the average is $X = 18.10$. This

Table 9. T-test results for pre-test and post-test scores of Beck hopelessness measurements of participants in control and experiment group.

Groups	Measurement	n	X	S	sd	t	p
Control group	Pre-test	20	18.60	1.39	19	1.83	.083
	Post-test	20	19.20	1.15			
Experimental group	Pre-test	20	18.10	1.55	19	15.59	.000
	Post-test	20	9.20	2.76			

finding indicates that swimming exercise has a significant impact on reducing depression levels in women over 55 years of high hopelessness.

When examining Table 9, there is no significant difference between the pre-test and post-test values of the hopelessness levels of the control group with whom no application is performed.

DISCUSSION AND CONCLUSION

Analysis of the data shows a significant decrease in the levels of depression and hopelessness of individuals participating in the swimming exercise, however no practice is performed in the control group and there was no significant change in levels of hopelessness and depression. In this sense, swimming exercise in women with high levels of hopelessness and depression over 55 years of age can be said to have a significant impact on reducing the levels of hopelessness and depression. Although exercise is both cost-effective and has significant effects in terms of physical health, it is not particularly considered in the treatment of depression that women widely experience. It is known that exercise removes psychological negativity and has positive effects on psychological health by increasing the level of dopamine and serotonin hormones (Özdemir and Uysal, 2018). Studies show that 12 weeks of exercise reduces the symptoms of depression in women of advanced age (Radloff, 1997); Liu et al. (2018) in their study applied a swimming program for 4 weeks to rats who underwent chronic mild stress protocol for 7 weeks. It is noted that the resulting depressive behaviors are reversed with the help of swimming. Kim et al. (2014) in their study on women during menopause noted that moderate physical activity leads to a decrease in psychosocial symptoms. Physically inactive women, compared to active women, show increased levels of depression and anxiety, decreased well-being, memory concentration problems. It has also been reported that physically active women have a better quality of life (Mansikkamaki et al., 2015). Dugan et al. (2015) noted in a study with women aged 42 to 52 years that as the severity of physical activity increased, depressive symptoms decreased over time. Mokhtaria et al. (2013) stated a 19.8% decrease in depressive symptoms with a 12-week exercise program.

Stojanovska et al. published a review based on 80 studies in 2014, and in this they concluded that positive correlation is indicated between physical activity and clinical depression, regardless of gender, age and health status. After discontinuation of the use of antidepressant drugs, depression scores were lower compared to the sedentary group. The results of participants engaged in regular physical activity showed a better mood, self-esteem, high psychological well-being as a result of reduced anxiety and stress (Stojanovska et al., 2014). Despite the evidence of research on the benefits of exercise, the vast majority of the elderly population are sedentary (Brown et al., 2005). Decreased mobility with the progression of age brings many negative effects. One of the leading psychological problems that come with the sedentary life is hopelessness. Gür et al. (2017) stated that physical activity reduces the level of hopelessness in their study. Savaşan et al. (2013) reported that the score of physical activity decreases as hopelessness increases. Similarly, Taliaferro et al. (2009) stated that people engaged in physical activity showed lower symptoms of hopelessness and depression than those who are not.

In conclusion, it is seen that the findings of other studies from the related literature are in parallel with the findings of this study. In this sense, taking findings of this study into consideration, it can be concluded that swimming exercise, has a positive effect on decreasing hopelessness and depression levels in women over the age of 55 who are in hopelessness of self-integrity according to Ericson and it can be said that exercise in old age will bring substantial benefits for people both physically and psychologically.

REFERENCES

- Beck, A. T., and Beamesderfer, A. (1974). Assessment of depression: the depression inventory. In *Psychological measurements in psychopharmacology* (Vol. 7, pp. 151-169). Karger Publishers.
- Beck, A. T., Rush, A. J., Shaw, B. F., and Emery, G. (1979). *Cognitive therapy of depression*. Guilford Press, New York.
- Beğer, T., and Yavuzer, H. (2012). Yaşlılık ve Yaşlılık Epidemiyolojisi. *Klinik Gelişim*, 25(3): 1-3.
- Brown, D. R., Yore, M. M., Ham, S. A., and Macera, C. A. (2005). Physical activity among adults ≥50 years with and without disabilities, BRFSS 2001. *Medicine and Science in Sports and Exercise*, 37(4): 620-629.
- Budde, H., Wegner, M., Soya, H., Voelcker-Rehage, C., and McMorris, T. (2016). *Neuroscience of exercise: Neuroplasticity and its*

- behavioral consequences. *Neural Plasticity*, 2016: 3643879.
- Burger, J. M. (2006).** Kişilik. *Kaknüs Yayınları*. s. 163-168
- Buyukozturk, S. (2014).** Sosyal bilimler için veri analizi el kitabı: İstatistik, araştırma deseni, SPSS uygulamaları ve yorum [Handbook of data analysis for social sciences: Statistics, research design, SPSS applications and interpretation]. Ankara: Pegem Akademi.
- Creswell, W. J. (2016).** Araştırma Deseni. (Çev: S.B. Demir). Ankara: Eğiten Kitap Yayım Evi.
- Dilbaz, N., and Seber, G. (1993).** Umutsuzluk kavramı: Depresyon ve intiharda önemi.
- Dugan, S. A., Bromberger, J. T., Segawa, E., Avery, E., and Sternfeld, B. (2015).** Association between physical activity and depressive symptoms: midlife women in SWAN. *Medicine and Science in Sports and Exercise*, 47(2): 335-342.
- Durak, A., and Palabıykoğlu, R. (1994).** Beck Umutsuzluk Ölçeği Geçerlilik Çalışması. *Kriz Dergisi*, 2(2): 311-319.
- Eker, E., and Noyan, A. (2004).** Yaşlıda Depresyon ve Tedavisi. *Klinik Psikiyatri*, 2: 75-83.
- George, D., and Mallery, M. (2010).** SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update (10th ed.) Boston: Pearson
- Gür, Y., Gencay, S., and Demir, A. (2017).** İşitme Engelli Bireylerin Fiziksel Aktivite ve Umutsuzluk Düzeyleri. *Uluslararası Hakemli Ekonomi Yönetimi Araştırmaları Dergisi*, 2492, 61-73.
- Hisli, N. (1988).** One study on Beck Depression Inventory. *Journal of Psychology*, 6: 118-122.
- Kılınc, S., and Torun, F. (2011).** Türkiye’de Klinikte Kullanılan Depresyon Değerlendirme Ölçekleri. *Dirim Tıp Gazetesi*, 86(1): 39-47.
- Kim, M. J., Cho, J., Ahn, Y., Yim, G., Park, H. Y. (2014).** Association between physical activity and menopausal symptoms in premenopausal women. *BMC women’s health*, 14(1): 122.
- Kolb, B., Gibb, R., and Robinson, T. E. (2003).** Brain plasticity and Behavior. *American Psychological Society*, 12(1): 1-5.
- Liu, W., Xue, X., Xia, J., Liu, J., and Qi, Z. (2018).** Swimming exercise reverses CUMS-induced changes in depression like behaviors and hippocampal plasticity-related proteins. *Journal of Affective Disorders*, 227: 126-135.
- Mansikkamaki, K., Raitanen, J., Malila, N., Sarkeala, T., Männistö, S., Fredman, J., Heinävaara, S., and Luoto, R. (2015).** Physical activity and menopause-related quality of life a population-based crosssectional study. *Maturitas*, 80(1): 69-74.
- Melges, F. T. (1969).** Types of hopelessness in psychological process. *Archives of General Psychiatry*, 20: 690-699.
- Mokhtari, M., Nezakatalhossaini, M., and Esfarjani, F. (2013).** The effect of 12-week pilates exercises on depression and balance associated with falling in the elderly. *Procedia-Social and Behavioral Sciences*, 70: 1714-1723.
- Özdemir, Ö. Ç., and Uysal, M. F. (2018).** Postmenopozal Dönemde Pilates Egzersizlerinin Yaşam Kalitesi ve Depresyon Üzerine Etkisi.
- Radloff, L. S. (1977).** The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1: 385-401.
- Rideout, E., and Montemuro, M. (1986)** Hope, morale and adaptation in patient with chronic heart failure. *Journal of Advanced Nursing*, 11: 429-438.
- Savaşan, A., Ayten, M., and Ergene, O. (2013).** Koroner Arter Hastalarında Sağlıklı Yaşam Biçimi Davranışları ve Umutsuzluk. *Journal of Psychiatric Nursing/Psikiyatri Hemşireleri Dernegi*, 4(1). Doi: 10.5505/phd.2013.07279.
- Savasır, I., and Sahin, N.H., (Eds.), (1997).** Assessment in cognitive and behavioural therapies; scales that used frequently. *Turkish Psychologist Association*, Ankara.
- Sofi, F., Valecchi, D., Bacci, D., Abbate, R., Gensini, G. F., Casini, A., and Macchi, C. (2011).** Physical activity and risk of cognitive decline: a meta-analysis of prospective studies. *Journal of Internal Medicine*, 269: 107-117.
- Sönmez, H.O., Becer, E., Gülen, Ö., and Madak, E. (2020).** 4 Haftalık Serbest Stil Yüzme Eğitiminde Beceri Öğreniminin Kaygı Düzeyi Üzerine Etkisi. *Social Mentality and Researcher Thinkers Journal*. Doi: <http://dx.doi.org/10.31576/smryj.442>.
- Stojanovska, L., Apostolopoulos, V., Polman, R., and Borkoles, E. (2014).** To exercise, or, not to exercise, during menopause and beyond. *Maturitas*, 77(4): 318-323.
- Taliaferro, L. A., Rienzo, B. A., Pigg, R. M., Miller, M. D., and Dodd, V. J. (2009).** Associations between physical activity and reduced rates of hopelessness, depression, and suicidal behavior among college students. *Journal of American College Health*, 57(4): 427-436.
- Tiryaki, K. (2020).** Analysis of the perceptions of national rowing athletes' hopelessness and self-esteem levels. *African Educational Research Journal*, 8(2), 305-313.
- Ulusoy, A. (2006).** Gelisim ve Öğrenme. Ankara: Ani Yayıncılık. s. 93-95.
- Wong, A. M., Chou, S. W., Huang, S. C., Lan, C., Chen, H. C., Hong, W. H., Chen, C. P. C., and Pei, Y. C. (2011).** Does different exercise have the same effect of health promotion for the elderly? Comparison of training-specific effect of Tai Chi and swimming on motor control. *Archives of Gerontology and Geriatrics*, 53: 133-137.
- Yau, S. Y., Li, A., Sun, X., Fontaine, C. J., Christie, B. R., and So, K. F. (2016).** Potential Biomarkers for Physical Exercise - Induced Brain Health. In: Wang M, editor. *Role of Biomarkers in Medicine*. UK, London: IntechOpen. p.169-91.

Citation: Kaya, H. B. (2020). Effect of swimming exercise in old age on hopelessness and depression levels. *African Educational Research Journal*, 8(2): S353-S359.
