ÖZGÜN ARAŞTIRMA ORIGINAL RESEARCH

Med J SDU / SDÜ Tıp Fak Derg ▶ 2022:29(3):446-453 doi: 10.17343/sdutfd.1131445

THE EFFECT OF STRUCTURED EXERCISE PROGRAM ON LIFE AND SLEEP QUALITY IN PATIENTS WITH SCHIZOPHRENIA

ŞİZOFRENİ HASTALARINDA YAPILANDIRILMIŞ EGZERSİZ PROGRAMININ YAŞAM VE UYKU KALİTESİNE ETKİSİ

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Cite this article as: Korkmaz Aslan T, Ekinci M. The Effect of Structured Exercise Program on Life and Sleep Quality in Patients with Schizophrenia. Med J SDU 2022; 29(3): 446-453.

Öz

Amaç

Bu çalışmanın amacı, şizofreni hastalarında yapılandırılmış egzersiz programının yaşam kalitesi ve uyku üzerine etkisini araştırmaktır.

Gereç ve Yöntem

Bu çalışma, davranış bilimleri ve halk sağlığı alanında kesitsel tarzda hazırlanmıştır. Örneklem büyüklüğü basit rasgele örnekleme yöntemi ile belirlenmiş olup, 30'u araştırma, 31'i kontrol grubu olmak üzere toplam 61 hasta çalışmaya dâhil edilmiştir. Deneklere demografik bilgileri içeren Pittsburg Uyku Kalitesi İndeksi (PSQI) ve Dünya Sağlık Örgütü Yaşam Kalitesi ölçekleri uygulandı. Veriler Mayıs 2015 ile Eylül 2016 arasında üç dönemde (1., 6. ve 12. haftalar) toplanmıştır. Verilerin analizi SPSS 20.0 (IBM Inc, Chicago, IL, ABD) programı ile gerçekleştirilmiş olup, Student t-testi, ANOVA ve tekrarlı ölçümlü ANOVA testleri kullanılmıştır.

Bulgular

Yaşam kalitesi ve uyku kalitesi indeksleri kontrol grubunda anlamlı farklılık göstermezken, çalışma grubunun egzersiz sonrası yaşam kalitesi puanları anlamlı olarak arttı ve uyku kalitesi puanları anlamlı olarak azaldı. Ayrıca üç aylık sürenin sonucunda çalışma ve kontrol grupları arasında uyku kalitesi puanları arasında anlamlı bir fark bulunmuştur.

Sonuç

Şizofreni hastalarına uygulanan yapılandırılmış egzersizin yaşam ve uyku kalitesini artırdığı belirlendi. Psikiyatri hemşireliğinde tedavinin etkinliğini artırmak için egzersizin tamamlayıcı bir yöntem olarak kullanılması önerilmektedir.

Anahtar Kelimeler: Egzersiz, Hemşirelik, Şizofreni, Uyku kalitesi, Yaşam kalitesi

Abstract

Objective

The aim of this study is to investigate the effect of the structured exercise program on the quality of life and sleep in patients with schizophrenia.

Material and Method

This study was designed as a cross-sectional study in behavioral sciences and public health. The sample size was determined by random sampling method,

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Müracaat tarihi/Application Date: 15.06.2022 • Kabul tarihi/Accepted Date: 24.08.2022
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and a total of 61 patients, 30 for the study and 31 for the control group, were enrolled in the study. The Pittsburg Sleep Quality Index (PSQI) and World Health Organization Quality of Life (WHOQOL-BRIEF-TR) scales with demographical information were applied to the subjects. The data was collected in three periods (1st, 6th, and 12th weeks) between May 2015 and September 2016. The analysis of the data was performed by SPSS 20.0 (IBM Inc, Chicago, IL, USA) program using Student t-test, ANOVA, and repeated measure ANOVA.

Results
While the quality of life and sleep quality indices did not differ significantly in the control group, the post-exercise quality scores of life of the study group increased significantly, and the quality of sleep scores decreased significantly. In addition, a significant difference was found between the sleep quality scores of the study and control groups as a result of the three-month period.

Conclusion
It has been determined that structured exercise applied to patients with schizophrenia increases the quality of life and sleep. It is recommended to use exercise as a complementary method to increase the effectiveness of treatment in psychiatric nursing.

Keywords: Exercise, Nursing, Schizophrenia, Sleep quality, Quality of life

Introduction

Schizophrenia is a disease that continues with deterioration, recovery, and repetition in the aspects of thought, perception, and affection (1). Although there are important symptoms in all aspects of functionality in schizophrenia, there is no certain biomarker to help for diagnosis. Disability usually occurs in schizophrenia. The sick individual shows a deterioration in his daily life, work, and social relations or functions. All treatments for schizophrenia are carried out in order to relieve the acute symptoms of patients, improve their quality of life and functionality, and bring the patient back to the community (2). The annual incidence rate of schizophrenia is given between 10 and 54 per 100,000 (3, 4) In Turkey, it can be stated that nearly 1-2 million people were affected by schizophrenia (4). Schizophrenia causes problems such as lack of self-care, loss of social skills, deterioration of physical health, stigma, economic difficulties, inability to use individual powers, reduced opportunities for self-development and poor living conditions. Therefore it can reduce the quality of life of sick individuals and cause various problems after discharge (5, 6).

It is expressed that the sleep alterations related to schizophrenia were known since Kraepelin and cause sleep disorders at the rate of 30-80% depending on the intensity of psychotic symptoms (7). There are many studies in the literature showing the relationship between sleep disorders and decreased quality of life, increased cognitive disorders, and hospitalization (8-12).

It is among the duties of the psychiatric nurse to develop behaviors of a healthy lifestyle (exercise, diet, smoking stop) for physical problems that may arise in psychiatric patients (13). In those struggling with schizophrenia, drug therapy is mainly used. However, the structured exercise program together with other therapies may be a novel, inexpensive, effective, and easy-to-apply method, in which the families are also involved, for schizophrenic patients. It is a supportive treatment that can significantly affect the prognosis of the disease in a TRSM (Community Mental Health Center), both in the clinical setting and after discharge. This study was conducted to reveal the effect of the structured exercise program applied to schizophrenia patients treated in the TRSM on the quality of life and sleep.

Material and Method

The population of the study consisted of schizophrenia patients (N≈120) who regularly attend the activities of the TRSM, which is affiliated with an Education and Research Hospital, and receive outpatient treatment. A study and control group was formed by a simple random sampling method among the schizophrenia patients who met the inclusion criteria and participated voluntarily following the power analysis of two proportions with 85% power. The study was initiated by obtaining ethical approval from the Ethics Committee of the Faculty of Health Sciences of Atatürk University (02/17/2015 and No: 98/3) and written consent from the relevant institution. Then, a total of 61 patients with schizophrenia, 30 study, and 31 control groups, were selected randomly and subjected to a structured exercise program between May 2015 and September 2016. The volunteer participants were asked to sign the informed consent form. Data are subject to third-party restrictions. This

study was conducted following the ethical principles of medical research and publication, as outlined by Helsinki Declaration.

The inclusion criteria for the study were determined as having a diagnosis of schizophrenia according to DSM-V diagnostic criteria at least 1 year ago, being open to communication and collaboration, and participating voluntarily in the study. The patients with cognitive disorder, language problems at a level preventing psychiatric interview, acute exacerbation period, having dementia and/or another organic mental disorder diagnosis, having mental retardation determined by clinical interview, and refusing to participate in the study were excluded from the study. The dataset consisted of the "Personal Information Form" and two scales of "WHO- Quality of Life" and "Pittsburgh Sleep Quality Index" applied to the study and control groups. The applications of the scales were performed with the face-to-face interview technique and repeated at the 6th and 12th weeks. No interventional procedures were performed on these patients and informed consent was signed.

The Personal Information Form consists of 11 questions and includes socio-demographic information. WHOQOL-BRIEF-TR consists of 26 items selected from the WHOQOL-100 scale as a result of pilot studies conducted in 15 centers worldwide. The adaptation of the scale to the Turkish language was carried out by conducting validity and reliability (Cronbach's alpha = 0.70) studies.13 Four items are coded reversed since they contain negative statements. The Pittsburgh Sleep Quality Index was developed by Buysse et al. in 1989 to evaluate sleep quality in psychiatric practices and clinical research (Cronbach's alpha = 0.80) (14).

A preparatory session was held first with schizophrenia patients in the study group. Necessary information about the exercise program implemented for 12 weeks was given and assured that the tests were not an exam. The exercise program consists of 40 minutes of practice sessions consisting of 5 minutes of warm-up, 10 minutes of stretching, 10 minutes of strengthening, 10 minutes of limber up, and 5 minutes of cooling along 12 weeks. For control groups, the exercise program was not applied and only test forms were filled for pretest, 6th, and 12th weeks.

Statistical Analyses

The data were analyzed by SPSS 22.0 (IBM Inc, Chicago, IL, USA). The descriptive statistics were presented as mean ± SD and frequency (percentage). The normality of the scale scores was checked by the Shapiro-Wilk test. In the comparison of independent groups, Student t-test and ANOVA, and Repeated Measure ANOVA were used for pre and post-measurements of the exercise period of times. As a post-hoc analysis, Tukey HSD was preferred for pairwise comparisons. P<0.05 value was considered as statistically significant results for 5% Type-I error.

Results

In the study group, 46.7% of the patients were women and 38.7% of the patients were women in the control group (p=0.712). Most of the patients were single (85.3%). The majority of patients (90.1%) in both groups graduated from primary school. It was determined that almost all of the patients have no job and live in the city center. It was found that 67.7% of the patients in the control group stayed in the nuclear family, 12.9% in the extended family, and 19.4% in the nursing home, whereas 46.7% of the patients in the study group were in the nuclear family, 10% in the extended family and 43.3% in the nursing home (p=0.128). The rate of individuals with other mental diseases in the families of schizophrenia patients was 19.4% in the control group and 23.3% in the study group. It was determined that the duration of attendance to the TRSM was between 1-6 months for half of the patients and between 6-12 months for the other half. It was also determined that the majority of the patients (>90%) used their medications regularly (Table 1).

The average age of the patients in the control group was 36.19 ± 9.84 years, and for the patients in the study group was 39.70 ± 9.96 years. The mean duration of the disease was higher (20.87 ± 8.51 years) in the study group than in the control group (17.77 ± 9.75 years), but not significantly (p=0.415).

Quality of life scale scores was compared between the measurement time periods and the groups. It was determined that there was no significant difference (p=0.242) between the quality of life for three periods in the control group. However, there was a significant difference (p=0.032) in the quality of life of the patients in the study group. It was shown that the quality of life increased significantly over time. The scores of physical health, mental health, and social life subscales for patients in the control group were not found different significantly. But, the environmental area score (63.98±9.56 points) was significantly higher after 3 months exercise program (p=0.001) for the control group. In the study group, all subscale scores were significantly different and lower in the pre-exercise program (p=0.001 at least).

Table 1 The demographical characteristics of patients in both groups

Properties	Control (n=31)		Study (n=30)		P
	n	%	n	%	
Gender					
Female	12	38.7	14	46.7	.712
Male	19	61.3	16	53.3	
Marital status					
Married	7	22.6	2	6.7	.142
Single / Widowed	24	77.4	28	93.3	
Education Level					
Primary	23	74.2	22	73.3	.269
High School	4	12.9	7	23.4	
College / University	4	12.9	1	3.3	
Working Status					
Work	1	3.2	1	3.3	1.000
Not Work	30	96.8	29	96.7	
Place of Residence					
Province	30	96.8	30	100.0	N/A
County	1	3.2	-	-	
Family type					
Nuclear family Extended family Nursing Home	21 4 6	67.7 12.9 19.4	14 3 13	46.7 10.0 43.3	.128
Mental diseases in the family					
Yes No	6 25	19.4 80.6	7 23	23.3 76.7	.947
Duration of TRSM					
1-6 Months 7-12 Months	20 11	64.5 35.5	15 15	50.0 50.0	.375
Using Medications Regularly					
Yes No	28 3	90.3 9.7	29 1	96.7 3.3	.612

There was no significant difference between the study and control group values of the overall life quality scores. In the physical health subscale, the score of the study group was significantly higher after three months period (p=0.004). For the mental health subscale, there was no significant difference between the study and control groups (p>0.05). Although the scores of social area for the pre-exercise period did not differ significantly, there was a significant difference between the groups both for the 6th and 12th measurement periods (p=0.008 and p=0.019 respectively. The environmental area score was significantly lower in the study group for all three measurement periods (all p<0.01).

The mean sleep quality score of the patients in the control group was found to be 6.16±2.11 before exercise, 6.16 ± 2.13 after 45 days after exercise, and

Table 2 Comparison of Quality of Life in patients between the Study and control Groups pre and post exercise periods

WHOQOL-BRIEF	Before exercise [a]	After 45 days [b]	After Three months [c]		
	Mean±SD			P	Post-hoc
General Quality of Life					
Control	56.05±16.42	56.45±16.42	57.26±15.74	.242	a=b=c
Study	55.83±13.02	57.92±12.92	59.58±12.58	**.032***	a<b<c
P	.955	.701	.527		
Subscales					
1. Physical Health					
Control	55.41±11.40	57.03±10.16	57.03±10.16	.109	a=b=c
Study	55.36±10.52	61.55±9.64	64.40±8.77	**< .001***	a<b<c
P	.984	.080	**.004****		
2. Mental Health					
Control	54.97±12.97	56.45±12.68	55.78±12.81	.120	a=b=c
Study	51.67±11.82	59.17±13.19	60.97±12.26	**< .001***	a<b<c
P	.303	.416	.111		
3. Social					
Control	50.94±14.90	50.94±14.90	50.54±15.09	.622	a=b=c
Study	53.19±17.36	62.08±16.72	60.42±16.77	**.001***	a<b=c
P	.588	**.008****	**.019****		
4. Environmental					
Control	63.98±9.56	65.23±7.34	66.58±7.40	**.001***	a=b<c
Study	55.65±8.89	59.26±7.97	59.81±6.99	**.001***	a<b=c
P	**.001****	**.003****	**.001****		
PUKI					
Control	6.16±2.11	6.16±2.13	6.13±2.36	.959	a=b=c
Study	6.47±2.53	5.40±1.92	3.63±1.16	**< .001***	a>b>c
P	.610	.149	**< .001****		

*: significant at 0.05 levet according to Repeated measure ANOVA,
**: significant at 0.05 level according to independent sample Student t-test,
a,b,c: denote the Tukey HSD post-hoc test results

6.13 ± 2.36 after three months. It was determined that there was no significant difference (p =0.959) between the total sleep quality score average obtained from three measurements of the patients in the control group. The mean sleep quality score of the patients in the study group was 6.47±2.53 before exercise, 5.40 ± 1.92 after 45 days after exercise, and 3.63 ± 1.16 after three months. It was determined that there was a significant difference (p <.001) between the total sleep quality scores for three measurements. It was determined that the average total sleep quality score gradually decreased. In addition, in the 12-week period, the sleep quality index of the study group was found to be significantly higher (p <.001) compared to the control group. There were seven subscales of PSQI. Among the subscales, subjective sleep quality, sleep latency, sleep disturbance, and daytime dysfunction subscales had a significant difference

between the exercise periods (all p<0.001). The sleep duration, sleep efficiency and use of sleep medication components of PSQI did not differ between the exercise periods. Furthermore, the components of subjective sleep quality, sleep latency, and sleep disturbance were found significantly lower in the study group for 3 months period after exercise (Table 2).

Discussion

The view that quality of life is an important indicator of the functionality of patients with schizophrenia has begun to increase gradually. Improving the quality of life has become an important goal of schizophrenia treatment (15). As well as the use of drugs, a patient should be supported by various psychological and social experiments to gain a better quality of life (16). Some studies indicate that regular exercise benefits psychiatric disorders (17). Positive effects of community mental health centers on improving the quality of life of patients have been observed (18).

In a case & control study, the patients with schizophrenia received aerobic exercise 3 days a week for 10 weeks, and it was observed that there was a significant decrease in symptoms in the exercise group. Besides, there was a significant increase in patients' quality of life. Accordingly, it has been stated that low - medium level aerobic exercises will be very useful in reducing symptoms and increasing the quality of life (19). Studies have reported that exercise increases social abilities and decreases depression and psychotic symptoms in patients with schizophrenia (20).

In this study, in accordance with the literature, it was observed that the increase in general quality of life was due to the positive effect of exercise, and patients felt better. Moreover, there was no change in the quality of life of patients in the control group as physical health, while a positive increase was observed in the patients in the study group since the exercise was effective.

It was stated that, in a study, psychotic people increase their capacity for physical activity, maintain weight control due to continuous physical exercise, and thus increase their self-esteem. These positive changes are reflected in every area of the individual's life. Açıl (2006) performed a 10-week physical exercise program in a study with schizophrenia patients and found that exercise contributed positively, especially in physical and mental areas in terms of quality of life (21). It can be said that the result of this study conformed with the studies in the literature.

Although there was no change in the control patients on the mental health, there was a positive increase in the study patients after the exercise program was completed. In some studies, it was stated that physical activity contributes positively to the spiritual field, improves the psychological quality of life in patients with schizophrenia, increases the mental health scores by 16%, and affects the increased quality of healthy life (22). This study claims that a positive change can be seen in the patients of the study group who enjoyed life during exercise activities, felt happier, and appeared cheerful since they don't feel alone.

In a similar study conducted in the Community Mental Health Center, it was found that the provided activities increased significantly the quality of life, general and social functionality, and reduced disability (23). It was also stated that the patients with chronic mental illness, who participated in a psychosocial rehabilitation program, have less active symptoms of discomfort and disability, higher insight into disease and treatment, and better social and family functionality (24, 25). The study showed that the structured exercise program increased socialization. Therefore, regular exercise is important for schizophrenia patients in terms of social life.

In this study, it was determined that both the control and study groups had a significantly higher quality of life in the environmental field. It is stated that the events such as group work, and spending time together in the exercise program affect this situation. The reason for the increase in the environmental area in both groups can be explained by the patients' follow-up to TRSM. In the study group, the level of quality of life in the physical, mental, social, and environmental areas increased significantly after exercise, while there was no increase in the control group except for the environmental area. It can be said that this difference between the study and the control group is caused by the planned and regular exercise of the patients in the study group. The positive effects of the structured exercise program started to be realized on the 45th day and continued in the third month. It can be said that this result confirms the hypothesis of the research.

Although sleep problems are a common problem in patients with schizophrenia, they can also affect the treatment process and direct the prognosis of the disease (8, 11). Serious and persistent sleep problems are common in patients with schizophrenia. In schizophrenia, an excessive amount of dopamine in the brain, high anxiety, and side effects of drugs are factors that lead to sleep problems. Improving

sleep quality in patients with schizophrenia generally reduces their psychiatric symptoms. (26). For these reasons, psychiatric nurses who evaluate the patient in all aspects should determine the sleep pattern of the patients and the factors affecting them and should take the necessary precautions to improve the quality of sleep. 8-11 In a study on schizophrenia, the symptoms of patients, quality of life, and sleep were measured and those who could not sleep well were found to have a low quality of life. In addition, it was observed that they were more depressed and those who could not sleep well were exposed to the side effects of medications more than those who slept well (27). In another study, it was observed that depression levels decreased and sleep quality levels increased as a result of a 10-week exercise program. In particular, it has been reported that moderate-paced exercise affects sleep quality in the early evening (28). In a study on subjects with insomnia and hypersomnia, it was observed that exercise improves sleep quality, provides sleep continuity, and decreases the frequency of waking up at midnight (29) O'Connor (30) stated in his epidemiological study that exercise started to sleep and regular physical activity was effective in increasing sleep quality and eliminating sleepiness during the day. In some recent studies with small groups, it was reported that the mechanisms of the exercise have excellent results in patients with schizophrenia, and future studies with large samples were suggested (31 - 33).

While the total sleep quality of the patients in the control group did not change for three months, the total sleep quality score of the patients in the study group decreased significantly during three months. A lower sleep score on the whole scale and subscales indicates an increase in sleep quality. In addition, in patients in the study group, subjective sleep quality, sleep disturbance, and daytime dysfunction were shown to show a significant decrease in the three-month post-exercise period compared to pre-exercise. In the study group, the patients with increased subjective sleep quality, sleep latency (easier to fall asleep), and decreased sleep disturbances, cause an increase in sleep quality by decreasing in daytime dysfunction scores. This study, also, shows that the total sleep quality and sleep latency of patients with schizophrenia in the study is gradually increasing especially after the 45th day compared to the control group. Therefore, the long duration of the exercise is important. A significant difference in total sleep quality scores, as well as subjective sleep quality, sleep disturbance, and daytime dysfunction emerge after the third month of the exercise program between the study and control groups.

There are some limitations to the study which are the completion time the study and the low sample size. Because the follow-up of the patients for their regular participation in the exercises during three months and gathering the information in three different periods had some difficulties.

It can be concluded that a structured exercise program is a supportive option that can significantly affect the course of the disease in TRSM as a new, inexpensive, effective, and easy-to-apply method for patients with schizophrenia. When structured exercise is added to classical treatment methods, it is known that patients will have a positive effect on the quality of life and sleep. Therefore, psychiatric nurses should regularly carry out exercise programs and support the patients, to reduce the symptoms of illness, improve life and sleep quality, and improve health for individuals diagnosed with schizophrenia with other care practices. In addition, it is recommended that psychiatric nurses should take the responsibility for directing schizophrenia patients to exercise practice, monitoring sleep patterns of schizophrenia patients at certain intervals, and receive an education on improving sleep quality and drug administration.

Acknowledgment
We would like to thank the responsible of the Community Mental Health Center (TRSM).

Conflict of Interest Statement
The authors have no conflicts of interest to declare.

Ethical Approval
This study was conducted following the ethical principles of medical research and publication, as outlined by Helsinki Declaration. The study was initiated by obtaining ethical approval from the Ethics Committee of the Faculty of Health Sciences of Atatürk University (02/17/2015 and No: 98/3).

Consent to Participate and Publish
Written informed consent to participate and publish was obtained from all individual participants included in the study.

Funding
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Availability of Data and Materials
Data is subject to third-party restrictions.

Authors Contributions

TKA: Conception; Design; Materials; Data collection/ Processing; Analysis and interpretation; Literature review; Writing.

ME: Conception; Supervision; Analysis and interpretation; Literature review; Critical review.

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