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Original Article

Results of the physical rehabilitation of patients with pulmonary tuberculosis

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Abstract:
The purpose of research - to substantiate the effectiveness of the impact of the proposed integrated program of physical rehabilitation of patients with pulmonary tuberculosis in a hospital. Materials and methods. The study involved 68 patients diagnosed with newly diagnosed pulmonary tuberculosis, with the absence of bacteria. It held Questioning; sample Stange, sample Genchi; computer spirometry, electrocardiography; used in a test Ukrainian version of the questionnaire of the World Health Organization quality of life. Results. In the study group significantly improved lung function, hypoxic samples the state of the cardiorespiratory system and the quality of their lives. Conclusion. The efficacy of a comprehensive program of physical rehabilitation with the use of therapeutic physical training, massage therapy, physiotherapy (UHF-therapy), hydrotherapy, manipulative interventions and educational programs to improve lung function, functional state of the cardiorespiratory system and the quality of life of patients with pulmonary tuberculosis hospital.
Key words: pulmonary tuberculosis; physical rehabilitation; respiratory function; cardiorespiratory system; the quality of life.

Introduction

Triathlon Tuberculosis is currently one of the most important medical and social problems not only in Ukraine but all over the world. Since 1995, Ukraine registered epidemic of tuberculosis, which is constantly progressing and acquiring alarming proportions [17, 21, 22].

Tuberculosis behaving aggressively affecting mainly young and middle-aged adults, resulting in a temporary and permanent disability and increased primary disability from this pathology, requires long complex treatment and rehabilitation of patients, pre-defines the negative social and economic consequences of [5, 16, 19, 20].

The lungs are most commonly affecting tuberculosis. Given the variety of forms of pulmonary tuberculosis, especially its flow in the available literature almost found systematic data on complex combination of means and methods of physical rehabilitation at regenerative treatment of this patient population, there is no reasonable physical rehabilitation program and description of their impact on the functional, physical condition and quality of life of patients [8, 12, 18].

Available research mainly relates sanatorium treatment of patients with pulmonary tuberculosis, physiotherapy applications [1, 2, 3, 4, 14]. There are some studies in which the application describes a method of therapeutic physical training and therapeutic massage in rehabilitation of patients with pulmonary tuberculosis [6, 7, 15].

All this proves and updates the topic of the proposed research, points to the need and the importance of implementing a comprehensive program of physical rehabilitation in the medical rehabilitation process of patients with pulmonary tuberculosis.

The purpose of research - to substantiate the effectiveness of the impact of the proposed integrated program of physical rehabilitation of patients with pulmonary tuberculosis in a hospital.

Materials and methods.

The studies were conducted based on phthisiotherapeutic department number 3 Rivne territorial medical association "Phthisiatria". The study involved 68 patients diagnosed with newly diagnosed pulmonary tuberculosis, with the absence of bacteria (BK-), of which there were 40 (58.82%) men and 28 (41.18%) women. The average age of the patients was 29,38 ± 1,18 years. Method of randomization, patients were divided into control and basic groups of 34 people in each of them - 20 men and 14 women. Patients of the control group (CG) were treated according to the protocol and rehabilitation by the usual method. The main group (MG) on the clinical form and age was identical to the control group where patients were treated according to the protocol and

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engaged on a comprehensive program of physical rehabilitation. Sex, age, severity of the pathological process were similar in both groups.

A comprehensive program of physical rehabilitation included: morning hygienic gymnastics (MHG), therapeutic gymnastics (TH), therapeutic massage, physiotherapy (UHF-therapy), hydrotherapy, manipulation intervention and educational programs.

We used the following research methods were used: analysis and compilation of scientific-methodical and professional literature; sociological methods (study of medical records, interviewing, questionnaires); pedagogical (pedagogical experiment, pedagogical supervision); Clinical (visual inspection, Stange sample, Genchi sample), and functional diagnostics tool (radiography, computer spirometry, electrocardiography), methods of mathematical statistics. To determine the effectiveness of physical rehabilitation carried out in accordance with international valuation standards of quality of life, we have been used Proven Ukrainian version of the questionnaire of quality of life of the World Health Organization (WHOQOL-100), designed to assess the quality of life of the adult population of Ukraine's population [13].

Results

Recommended us a comprehensive physical rehabilitation program designed to suit the pathogenesis, clinical picture of the disease, forms of tubercular process, the severity of the patient's condition, the level of physical fitness, motor abilities and quality of life, was aimed at the most complete restoration of health, normalization of the breathing apparatus and the disturbed functions of the organism, health improvement, restoration of motor activity and the patient's health, held against the backdrop of psychoemotional unloading.

We algorithms of physical rehabilitation process in accordance with medical-recovery period was designed, which provide for rehabilitation examination, keeping the main clinical forms of the disease, to establish the basic functional state violations, determining rehabilitation tasks and individual means of physical rehabilitation [12].

Evaluation of the effectiveness of treatment with the use of the proposed complex physical rehabilitation program conducted on a range of clinical and radiographic indices: the disappearance of symptoms of intoxication, a complete clinical well-being of the patients, no radiographic evidence of tuberculous inflammation, restoring the full function of the respiratory and cardiovascular systems, changes in lung function, improving level of physical health and quality of life of patients.

Application of a complex program of physical rehabilitation of patients' exhaust facilitated rapid normalization of the functional state of the respiratory system to the appropriate level (Table 1). This is evidenced by significantly higher than in patients with CG, values FVC, FEV1, PEF, normalization of tidal volume, respiratory rate and FEF ($p < 0.05$). If at the beginning of the study the average FVC in CG patients were at the level of 58,15 ± 1,68% (male) and 56,40 ± 1,97% (female) in the exhaust gas - 56,88 ± 1,43% and 55.35 ± 2.19%, respectively, the end of the study parameters became CG patients at 65,12 ± 1,56% (male) and 62,93 ± 1,71% (female) patients MG - 76,05 ± 1,39% and 75.33 ± 2.02%, respectively.

Table 1. Indicators of respiratory function in patients with pulmonary tuberculosis in both groups at the beginning and end of the study

Indicators respiratory function	Men CG (n = 20)		Men MG (N = 20)		Women CG (N = 14)		Women MG (N = 14)	
	at the beginning	in the end	at the beginning	in the end*	at the beginning	in the end	at the beginning	in the end*
FVC (% on proper)	58.15 ± 1.68	65.12 ± 1.56	56.88 ± 1.43	76.05 ± 1.39	56.40 ± 1.97	62.93 ± 1.71	55.35 ± 2.19	75.33 ± 2.02
FEV1 (% of proper)	54.36 ± 1.76	60.55 ± 1.59	55.80 ± 1.81	68.50 ± 1.85	52.14 ± 1.84	57.10 ± 1.67	52.98 ± 2.06	65.39 ± 2.09
PEF (% of proper)	55.68 ± 2.12	58.89 ± 1.93	56.04 ± 2.08	65.28 ± 1.73	52.23 ± 1.94	54.62 ± 1.82	51.22 ± 2.31	60.07 ± 2.21
TV (l)	0.48 ± 0.17	0.49 ± 0.14	0.47 ± 0.13	0.53 ± 0.12	0.46 ± 0.14	0.47 ± 0.14	0.47 ± 0.14	0.52 ± 0.14
BF (1 / min)	20.62 ± 0.66	18.89 ± 0.52	21.08 ± 0.87	16.35 ± 0.58	21.46 ± 1.07	19.43 ± 0.78	21.71 ± 1.18	15.50 ± 0.64
FEF (n)	10.96 ± 0.60	9.75 ± 0.57	11.03 ± 0.72	8.67 ± 0.47	11.15 ± 0.72	10.09 ± 0.45	11.05 ± 0.81	8.97 ± 0.55
FEF 25 (% of proper)	48.60 ± 2.01	52.68 ± 1.90	48.87 ± 2.22	66.72 ± 1.92	45.57 ± 1.72	48.82 ± 1.52	44.39 ± 2.04	56.95 ± 2.12
FEF 50 (% of proper)	52.81 ± 2.08	56.24 ± 1.95	51.17 ± 2.37	63.88 ± 2.25	49.73 ± 2.09	51.74 ± 1.87	49.04 ± 2.27	60.00 ± 1.82
FEF 75 (% of proper)	57.16 ± 2.45	59.41 ± 2.36	56.06 ± 2.68	69.87 ± 2.74	54.29 ± 2.19	56.54 ± 2.10	55.66 ± 2.89	67.43 ± 2.57

Note: * The differences between the study likely ($p \leq 0,05$) in all parameters to the main group

It was established that the total volume at the exhaust patients increased relative to the CG patients at 4.00% in men and by 5.00% in women ($p < 0.05$), resulting in an increase in the target exhaust VC.

Comparison of the initial and final values of the indicators of BF revealed that patients exhaust respiration rate at the end of the study was significantly lower (16,35 ± 0,58 per minute versus 18,89 ± 0,52 per minute for men and 15,50 ± 0 64 min vs. 19.43 ± 0.78 per minute in women ($p < 0.05$) than that of CG patients.

The analysis parameters respiratory minute volume revealed that the start of the study were patients with CG 10.96 ± 0.60 l (male) and 11,15 ± 0,72 (female) patients exhaust 11,03 ± 0 72 and 11.05 ± 0.81 respectively; end of the study - 9.75 ± 0.57 and 10.09 ± 0.45 and 8.67 ± 0.47 and 8.97 ± 0.55, respectively ($p<0.05$). Thus, the application of a comprehensive program of physical rehabilitation of patients with pulmonary tuberculosis normalization of the MOU took place by reducing the frequency of breathing, which is not observed in the group of patients treated by the standard program.

Statistically significant improvement in lung function in patients with the exhaust end of the study indicate a more pronounced positive effect of the proposed rehabilitation program than patients CG [9].

In order to objectively assess the results of the traditional methods of treatment and with the proposed comprehensive physical rehabilitation program, we assessed the respiratory and cardiovascular systems of patients in both groups at the beginning and end of the study using hypoxic samples Stange and Genchi.

At baseline parameters were reduced in both groups, which is given in Table 2, due to the presence of pathologic process in the lungs. Patients CG at the end of the study the average of the results of Stange sample became 29 for men and 30 for women, according to the results of the sample Genchi - at the level of 15 in men and women, indicating a slight increase in the functionality of the cardiorespiratory system (Table 3).

Table 2. The functional state of the respiratory and cardiovascular systems of patients in both groups in begin study (based on samples Stange and Genchi)

Patients: sex, group		Sample Stange, s	Sample Genchi, s
Men	Control group (n = 20)	28.30 ± 0.65	14.40 ± 0.42
	Main group (n = 20)	27.85 ± 0.57	14.15 ± 0.48
Women	Control group (n = 14)	27.79 ± 0.61	14.36 ± 0.40
	Main group (n = 14)	27.93 ± 0.61	14.21 ± 0.42

Patients MG average hypoxic samples have improved significantly. Thus, the delay time of breath at inhalation was 41 for men and 38 for women, and on the exhale - at the level of 21 in men and women, that is breath-hold value to inhale and exhale in patients MG was significantly greater than in patients CG (Table. 3).

Table 3. Functional condition of the respiratory and cardiovascular systems of patients in both groups at the end of study (based on samples Stange and Genchi)

Patients: sex, group		Sample Stange, s	Sample Genchi, s
Men	Control group (n = 20)	29.77 ± 0.57	15.66 ± 0.47
	More group (n = 20)	41.09 ± 0.45	21.38 ± 0.57
Women	Control group (n = 14)	30.24 ± 0.63	15.32 ± 0.35
	M group (n = 14)	38.05 ± 0.53	21.69 ± 0.54

Increasing the average values of indicators of functional tests in the study group after the pedagogical experiment is due to a specific effect of a complex of rehabilitation measures. Improvement of the functional state of the cardiorespiratory system in the study group shows the positive impact of the proposed program of physical rehabilitation[eleven].

With the help of a questionnaire quality of life of the World Health Organization (WHOQOL-100), which is designed to assess the quality of life of the adult population of Ukraine Ukrainian language (S. Phidenko, 2001), consisting of 100 questions, on 4 questions for each of the 24 subsphers and 4 "global question "to assess the overall quality of life and health, we have estimated the measure subjective well-being of patients in the control (n = 34) and the main group (n = 34), pulmonary tuberculosis and their satisfaction with the conditions of his life at the beginning of the study and after completion.

We have carried out assessment of the six major areas of quality of life: physical function, psychological function, level of independence, social relationships, environment and the spiritual realm, as well as directly determined by respondents' perception of their quality of life and overall health.

Based on the methodology for assessing the overall quality of life for each patient during the study was to determine the output and acquired the quality of life levels to monitor the dynamics of change.

It should be noted that in all patients with pulmonary tuberculosis were significantly reduced as the overall quality of life and health.

During the first two weeks after the diagnosis of pulmonary tuberculosis in men in the control group the overall quality of life and health status were 49,34 ± 0,46 points.

On separate areas of study baseline patients in the control group males were: the scope of the I, or the physical realm - 7,04 ± 0,26; II scope, scope or psychological - 7,67 ± 0,24; III scope or level of independence - 6,40 ± 0,26; scope IV, or social relationships - 7,71 ± 0,28; V scope or environment - 8,22 ± 0,24; VI scope, spirit or scope - 12,30 ± 0,45. Approximately the same low average initial level of overall quality of life and

health in men was the main group - 50,08 ± 0,54. They have separate areas for the study he was: the scope of the I, or the physical realm - 7,02 ± 0,32; II scope, scope or psychological - 7,75 ± 0,28; III scope or level of independence - 6,44 ± 0,30; scope IV, or social relationships - 7,75 ± 0,37; V scope or environment - 8,37 ± 0,30; the scope of the VI, or the spiritual scope - 12,

Analysing the above data, it can be argued that there was a general decline in the quality of life and health of patients due to the impact of the disease on all subscopes life.

Table 4. Overall quality of life and health status of patients with pulmonary tuberculosis in both groups of males

Scopes and Subscopes of quality of life	Control group (n = 20)		Main group (N = 20)	
	before	after	before	after
	$\bar{x}\pm m$	$\bar{x}\pm m$	$\bar{x}\pm m$	$\bar{x}\pm m$
G1. Scope I. Physical realm	7.04 ± 0.26	7.25 ± 0.26	7.02 ± 0.32	8.54 ± 0.30 *
F1. Pain and discomfort	6.35 ± 0.42	6.70 ± 0.40	6.50 ± 0.41	8.10 ± 0.37
F2. Vital activity, energy and fatigue	7.20 ± 0.41	7.35 ± 0.36	7.15 ± 0.42	8.45 ± 0.33
F3. Sleep and rest	7.55 ± 0.48	7.70 ± 0.45	7.40 ± 0.40	9.05 ± 0.41
G2. Scope II. Psychological scope	7.67 ± 0.24	7.89 ± 0.22	7.75 ± 0.28	8.90 ± 0.30 *
F4. Positive feelings	7.25 ± 0.44	7.45 ± 0.36	7.30 ± 0.40	8.65 ± 0.45
F5. Thinking, learning ability, knowledge	8.45 ± 0.36	8.60 ± 0.33	8.60 ± 0.44	9.90 ± 0.45
F6. Self-concept	8.10 ± 0.40	8.55 ± 0.36	8.25 ± 0.41	9.35 ± 0.42
F7. Body image and appearance	7.50 ± 0.47	7.45 ± 0.46	7.60 ± 0.42	8.45 ± 0.41
F8. Negative feelings	7.05 ± 0.41	7.40 ± 0.33	7.00 ± 0.41	8.15 ± 0.40
G3. Scope III. Independence level	6.40 ± 0.26	6.73 ± 0.26	6.44 ± 0.30	7,99 ± 0,26 *
F9. Mobility, the ability to move	7.55 ± 0.41	7.70 ± 0.37	7.60 ± 0.36	8.55 ± 0.33
F10. Performing daily activities	6.30 ± 0.41	6.80 ± 0.41	6.25 ± 0.45	8.95 ± 0.39
F11. Dependency on medicines and treatment	5.85 ± 0.42	6.10 ± 0.40	5.85 ± 0.42	6.30 ± 0.32
F12. The efficiency (ability to work)	5.90 ± 0.41	6.30 ± 0.16	6.05 ± 0.41	8.15 ± 0.40
G4. Scope IV. Social relations	7.71 ± 0.28	7.79 ± 0.06	7.75 ± 0.37	8,95 ± 0,35 *
F13. Personal relationships	7.05 ± 0.41	7.20 ± 0.39	7.00 ± 0.47	8.35 ± 0.47
F14. Social support	7.90 ± 0.41	7.90 ± 0.41	7.95 ± 0.47	8.30 ± 0.40
F15. Sexual activity	8.15 ± 0.40	8.25 ± 0.37	8.30 ± 0.45	10.20 ± 0.49
G5. Scope V. Environment	8.22 ± 0.24	8.32 ± 0.22	8.37 ± 0.30	8.68 ± 0.22
F16. Physical safety and security	7.50 ± 0.42	7.55 ± 0.41	7.40 ± 0.42	7.80 ± 0.36
F17. Home environment	9.30 ± 0.44	9.30 ± 0.44	9.15 ± 0.44	9.40 ± 0.40
F18. Financial resources	6.15 ± 0.49	6.20 ± 0.47	6.15 ± 0.47	6.45 ± 0.41
F19. Medical and social assistance	7.15 ± 0.42	7.45 ± 0.33	7.00 ± 0.41	7.30 ± 0.41
F20. The possibility of obtaining new information and skills	8.40 ± 0.48	8.50 ± 0.48	8.55 ± 0.47	9.75 ± 0.46
F21. Opportunities for recreation / leisure	6.65 ± 0.50	6.70 ± 0.49	6.80 ± 0.42	7.60 ± 0.39
F22. The physical environment	11.85 ± 0.48	11.85 ± 0.48	11.75 ± 0.45	11.95 ± 0.41
F23. Transport	8.75 ± 0.45	9.00 ± 0.40	8.60 ± 0.47	9.20 ± 0.39
G6. Scope VI. The spiritual scope	12.30 ± 0.45	12.30 ± 0.45	12.75 ± 0.44	13.25 ± 0.41 *
F24. Spirituality / religion / personal beliefs	12.30 ± 0.45	12.30 ± 0.45	12.75 ± 0.44	13.25 ± 0.41
G. The overall quality of life and state of health	49.34 ± 0.46	50.28 ± 0.45	50.08 ± 0.54	56,31 ± 0,53 *

Note: * - the difference between the indices was statistically significant ($p < 0.05$)

In patients with pulmonary tuberculosis females in both groups identified low average initial level of overall quality of life and health. For example, in women in the control group it was 49.37 ± 0.56 and 50.22 ± score 0.71 points in women basic group. On separate areas of study baseline in patients in the control group were the following: the scope of the I, or the physical realm - 6,95 ± 0,39; II scope, scope or psychological - 7,63 ± 0,30; III scope or level of independence - 6,50 ± 0,32; scope IV, or social relationships - 7,79 ± 0,35; V scope or environment - 8,25 ± 0,26; VI scope, spirit or scope - 12,25 ± 0 48.

Table 5. Overall quality of life and health status of patients with pulmonary tuberculosis both female groups

Scopes and Subscopes of quality of life	Control group (n = 14)		Main group (n = 14)	
	before	after	before	after
	$\bar{x}\pm m$	$\bar{x}\pm m$	$\bar{x}\pm m$	$\bar{x}\pm m$
G1. Scope I. physical realm	6.95 ± 0.39	7.19 ± 0.26	7.04 ± 0.40	9.00 ± 0.36 *
F1. Pain and discomfort	6.38 ± 0.49	6.75 ± 0.54	6.50 ± 0.50	8.38 ± 0.41
F2. Vital activity energy and fatigue	7.13 ± 0.53	7.38 ± 0.41	7.00 ± 0.50	8.75 ± 0.39
F3. Sleep and rest	7.38 ± 0.49	7.50 ± 0.42	7.63 ± 0.55	9.88 ± 0.57
G2. Scope II. psychological scope	7.63 ± 0.30	7.80 ± 0.28	7.75 ± 0.33	9.33 ± 0.36 *
F4. positive feelings	7.13 ± 0.53	7.25 ± 0.39	7.25 ± 0.48	9.88 ± 0.53
F5. Thinking, learning ability, knowledge	8.50 ± 0.50	8.63 ± 0.49	8.63 ± 0.41	10.13 ± 0.46
F6. self-concept	8.00 ± 0.50	8.38 ± 0.41	8.25 ± 0.48	9.75 ± 0.48

F7. body image and appearance	7.63 ± 0.49	7.75 ± 0.39	7.50 ± 0.56	8.50 ± 0.42
F8. negative feelings	6.88 ± 0.53	7.00 ± 0.42	7.13 ± 0.53	8.38 ± 0.41
G3. Scope III. independence level	6.50 ± 0.32	6.66 ± 0.35	6.47 ± 0.37	8,22 ± 0,39 *
F9. Mobility, the ability to move	7.63 ± 0.41	7.75 ± 0.39	7.50 ± 0.42	9.25 ± 0.48
F10. Performing daily activities	6.38 ± 0.55	6.63 ± 0.49	6.25 ± 0.48	9.00 ± 0.50
F11. Dependency on medicines and treatment	5.88 ± 0.46	6.00 ± 0.50	5.88 ± 0.53	6.50 ± 0.50
F12. The efficiency (ability to work)	6.13 ± 0.53	6.25 ± 0.54	6.25 ± 0.48	8.13 ± 0.53
G4. Scope IV. social relations	7.79 ± 0.35	7.89 ± 0.26	7.73 ± 0.41	8.68 ± 0.36 *
F13. Personal relationships	7.13 ± 0.53	7.25 ± 0.39	7.25 ± 0.58	8.13 ± 0.53
F14. social support	8.00 ± 0.56	8.25 ± 0.48	7.88 ± 0.46	8.38 ± 0.41
F15. sexual activity	8.25 ± 0.48	8.13 ± 0.46	8.00 ± 0.50	9.50 ± 0.42
G5. Scope V.Environment	8.25 ± 0.26	8.28 ± 0.26	8.23 ± 0.33	8.75 ± 0.30
F16. Physical safety and security	7.38 ± 0.41	7.63 ± 0.41	7.50 ± 0.42	8.00 ± 0.42
F17. home environment	9.63 ± 0.49	9.50 ± 0.42	9.38 ± 0.49	9.63 ± 0.49
F18. Financial resources	6.13 ± 0.46	5.88 ± 0.53	5.88 ± 0.46	6.50 ± 0.42
F19. Medical and social assistance	7.13 ± 0.46	7.13 ± 0.46	7.13 ± 0.53	7.25 ± 0.48
F20. The possibility of obtaining new information and skills	8.75 ± 0.48	8.88 ± 0.53	8.63 ± 0.49	9.38 ± 0.41
F21. Opportunities for recreation / leisure	7.00 ± 0.50	7.00 ± 0.50	6.88 ± 0.57	7.75 ± 0.54
F22. The physical environment	11.38 ± 0.59	11.25 ± 0.58	11.63 ± 0.55	12.00 ± 0.50
F23. Transport	8.63 ± 0.49	9.00 ± 0.42	8.88 ± 0.53	9.50 ± 0.50
G6. Scope VI. The spiritual scope	12.25 ± 0.48	12.25 ± 0.48	13.00 ± 0.50	13.38 ± 0.49
F24. Spirituality / religion / personal beliefs	12.25 ± 0.48	12.25 ± 0.48	13.00 ± 0.50	13.38 ± 0.49
G. The overall quality of life and state of health	49.37 ± 0.56	50.07 ± 0.59	50.22 ± 0.71	57,36 ± 0,99 *

Note: * - the difference between the indices was statistically significant (p <0.05)

In the main group of women figures of individual scopes of learning were: area I, or physical realm - 7,04 ± 0,40; II scope, scope or psychological - 7,75 ± 0,33; III scope or level of independence - 6,47 ± 0,37; scope IV, or social relationships - 7,73 ± 0,41; V scope or environment - 8,23 ± 0,33; VI scope, spirit or scope - 13,00 ± 0,50.

Thus, we can conclude that in patients with pulmonary tuberculosis males and females in both groups showed a rather low mean baseline level of overall quality of life and health status, which affected negatively on all subsphers life.

At the end of the study in patients with pulmonary tuberculosis male control group the average level of overall quality of life and health, several rose and amounted 50,28 ± 0,45 points.

However, after analysing the individual subsphers, we can say that statistically significant changes have occurred. On separate areas of study the figures were approximate to the original: the scope of the I, or the physical realm - 7,25 ± 0,26; II scope, scope or psychological - 7,89 ± 0,22; III scope or level of independence - 6,73 ± 0,26; scope IV, or social relationships - 7,79 ± 0,06; V scope or environment - 8,32 ± 0,22; VI scope, spirit or scope - 12,30 ± 0,45.

In male patients the main group at the end of the study the average level of overall quality of life and health status has risen considerably: from 50,08 ± 0,54 and became 56,31 ± 0,53 (p <0.05) points. On separate areas of study parameters were higher and were: area I, or physical scope - with up to 7.02 ± 0.32 8,54 ± 0,30 (p <0.05); II scope, scope or psychological - from 7.75 ± 0.28 to 8,90 ± 0,30 (p <0.05); III scope or level of independence - from 6.44 ± 0.30 to 7,99 ± 0,26 (p <0, 05); IV services or social relationship - with up to 7.75 ± 0.37 8,95 ± 0,35 (p <0.05); V services or the environment - from 8.37 ± 0.30 to 8,68 ± 0,22 (p <0.05); VI scope or spirit scope - from 12.75 ± 0.44 to 13.25 ± 0.41. In this way,

At the end of the study, patients in the control group of females there was a slight increase in the average level of overall quality of life and state of health, which amounted to 50.07 points. Selected indicators of areas of study they were: the scope of the I, or the physical realm - 7,19 ± 0,26 (p <0.05); II scope, scope or psychological - 7,80 ± 0,28; III scope or level of independence - 6,66 ± 0,35; scope IV, or social relationships - 7,89 ± 0,26; V scope or environment - 8,28 ± 0,26; VI scope or spirit scope - December 25 ± 0,48.

On separate areas of study of the general level of quality of life and health status of female patients of the group rose weighty: the scope of the I, or the physical realm - from 7,04 ± 0,40 to 9,00 ± 0,36 (p <0.05); II scope, scope or psychological - from 7.75 ± 0.33 to 9,33 ± 0,36 (p <0.05); III scope or level of independence - from 6.47 ± 0.37 to 8,22 ± 0,39 (p <0.05); IV services or social relationship - with up to 7.73 ± 0.41 8,68 ± 0,36 (p <0.05); V scope or environment - 8,75 ± 0,30; VI scope or spirit scope - from 13.00 ± 0.50 to 13.38 ± 0.49.

Thus, the mean baseline overall quality of life and health status of female patients of the main group increased from 0.71 to 50.22 ± 57,36 ± 0,99 (p <0.05). A significant increase in the overall quality of life and health status of women of the main group took place in all scopes and subsphers quality of life.

the control group at baseline, the highest level of overall quality of life and health in male patients was equal to 51.10, while the lowest - 46.65 points; in the study group - 52.20 and 47.17 respectively.

At the end of the study the highest level of overall quality of life and health status of patients with pulmonary tuberculosis control group male became 51.95 and the lowest - 47.50 points, in the study group - 58.30 and 53.40 respectively.

The highest level of overall quality of life and health status of patients with pulmonary tuberculosis control group of females at the beginning of the study was 52.80, and the lowest - 47.07; the main group - 52.77 and 46.23 respectively.

The highest level of overall quality of life and health status of the control group females at the end of the study was equal to 52.51, while the lowest - 47.00.

In the main group of females indicators rose significantly: the highest score was the 59.21, the lowest - 52.67 [10, 12].

Thus, we have proved the effectiveness of a comprehensive program of rehabilitation treatment using therapeutic physical training, massage therapy, physiotherapy (UHF-therapy), hydrotherapy, manipulative interventions and educational programs to improve lung function, functional condition and adaptive capacity of the cardiorespiratory system and quality of life of patients with pulmonary tuberculosis in a hospital.

Findings

1. As a result of our studies found a statistically significant ($p < 0.05$) increase in lung function in the study group in contrast to the patients in the control group, where significant changes have been identified, in particular: VC is superior to 10.93% in of males and 12.40% in females ($p < 0.05$), tidal volume 4.00% for men and 5.00% in women ($p < 0.05$), FEV1, MODvyd was significantly higher; MOD25 increased performance, MOD50, MOD75; respiratory rate normalized figures, tidal volume and respiratory minute volume.

Significantly improved the average hypoxic samples in the study group. Thus, the delay time of breath at inhalation was 41 for men and 38 for women, and on the exhale - at the level of 21 in men and women, that is breath-hold value to inhale and exhale in the study group was significantly higher than that patients in the control group.

2. Based on the assessment of the overall quality of life in patients with pulmonary tuberculosis male main group at the end of the study the average level of overall quality of life and health status has risen considerably: from 50,08 ± 0,54 and became 56,31 ± 0,53 ($p < 0.05$) score; Men in the control group the average level of overall quality of life and health rose slightly and amounted to 50,28 ± 0,45 points. Accordingly, the mean baseline overall quality of life and health status of female patients of the main group increased from 0.71 to 50.22 ± 57,36 ± 0,99 ($p < 0.05$); Women in the control group there was a slight increase from 49,37 ± 0,56 to 50,07 points. Thus, spending overall quality of life and health status monitoring of patients with pulmonary tuberculosis, we have achieved a higher quality of life of patients of the main group.

Analysing the data of examination of patients with pulmonary tuberculosis control ($n = 34$) and primary ($n = 34$) groups, identified several features: patients of the main groups, who were engaged in the recommended program complex physical rehabilitation previously noted positive dynamics. At the same time, in the subjects of the control group who were engaged by the usual method of physical rehabilitation, these changes occur much slower.

Conflict of interest

The authors state that there is no conflict of interest.

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