

# An influence of physical rehabilitation on living standards of children with chronic heart failure

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**Purpose:** to determine the impact of the developed program of physical rehabilitation on the quality of life of school-age children with chronic heart failure (CHF) I–IIA stages.

**Material & Methods:** analysis, generalization of scientific and methodological literature, Internet, survey method, methods of mathematical statistics. The study was conducted on the basis of the West-Ukrainian specialized children's medical center (Lviv). The experiment involved 34 school-age children with CHF I–IIA stages.

**Result:** the evaluation of the quality of life of school age children with EH with CHF I–IIA stages showed a significant improvement in the four blocks. The physical functioning according to the parents' information had the greatest improvement. Despite the increase in the indicator of the functioning of the child in school, it remains low. Improving emotional and social functioning contributes to the social adaptation of children in society. The positive and negative dynamics of QoL of children of CHF for block indicators is not reliably confirmed.

**Conclusion:** quality of life in children with CHF is an important integral indicator.

**Keywords:** physical rehabilitation, quality of life, children with chronic heart failure.

## Introduction

Given the unsatisfactory prediction of long-term survival of patients with chronic heart failure (CHF), maintaining their acceptable quality of life (QOL) at an acceptable level are important clinical tasks [9]. Decrease of QOL in patients with CHF is associated not only with physical discomfort accompanied by a sustained decrease in functional capacity, is a consequence of the clinical severity of the disease, the severity of subjective symptoms of CHF, low fraction of the ejection of the left ventricle, but also with psychoemotional discomfort, caused by both social maladjustment and mental depression, anxiety, depression associated with the perception of their illness, sleep disturbance, etc. [3].

QOL study in medicine allowed changing the traditional view on the problem of the disease and the patient [2]. Quality of life is considered as a health-related integral characteristic of the physical, psychological and social functioning of a healthy or sick person, based on his subjective perception [1; 2].

Control over the state of health and its treatment is impossible without the definition of QOL, as a criterion for the effectiveness of ongoing treatment and rehabilitation activities in modern medicine [4; 7]. Since the ultimate goal of any therapy is to increase life expectancy and improve its quality, that is why scientists pay significant attention to such research and development of effective methods of physical rehabilitation [8].

Support for quality of life is one of the important components of healthcare worldwide and its research is presented in many works: D. A. Klatchoian and others. (2010), J. Varni (2007, 2013), K. Kobayashi, K. Kamibeppu (2010), E. Pristupa, N. Kurish (2010), Y. Pavlova (2015), and others. Questions about the impact of physical rehabilitation on children's QOL were studied by scientists: N. A. Ivasik (children of school age

with acute broncho-pulmonary diseases, 2016). V. Vitomskaya (children with functional single ventricle of the heart, 2016), etc.

We see it necessary to determine the quality of life of children with CHF as a criterion for the effectiveness of the developed program of physical rehabilitation.

**Relationship of research with scientific programs, plans, themes.** The work is carried out on the theme of research work of Lviv State University of Physical Culture for 2016–2020. "Theoretical and methodical foundations of physical rehabilitation of disabled people with disruption of the musculoskeletal system and respiratory system" (Minutes No. 8 of 19.04.2016).

**Purpose of the study:** to determine the impact of the developed program of physical rehabilitation on the quality of life of school-age children with chronic heart failure (CHF) I–IIA stages.

## Material and Methods of the research

Study was conducted on the basis of the West-Ukrainian specialized children's medical center (Lviv). Experiment involved 34 school-age children with CHF I–II A stages. Distribution of children on experimental (16 children) and control group (18 children) conducted randomly and statistically set them equal effectiveness at the beginning of the experiment ( $p > 0,05$ ). Statistical processing of the results was performed using a nonparametric Mann-Whitney test to estimate the difference between two unrelated samples and the non-parametric Wilcoxon test to estimate the difference between two related samples.

Experimental group (EG) was engaged in the developed program of physical rehabilitation [6], which provided for practical

and theoretical parts. Practical part was aimed at improving both the functional and psycho-emotional state of children, and improving the quality of life and social adaptation. Theoretical studies were aimed at obtaining new knowledge, on the formation of patients' and their parents' attitudes toward self-control, the modification of the motor regime of the day, the way of life, etc.

**Research methods:** analysis, generalization of scientific and methodological literature, Internet, survey method, methods of mathematical statistics.

## Results of the research and their discussion

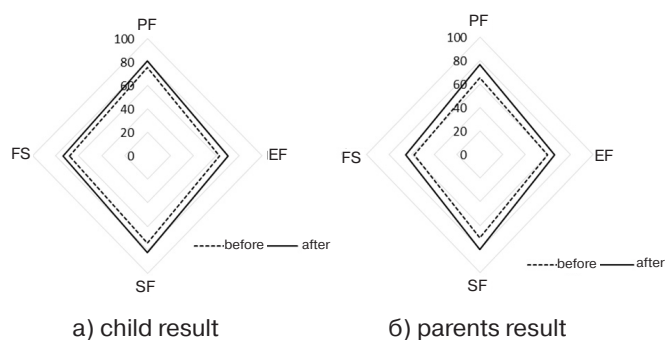
Since QOL is considered a full-fledged criterion of the effectiveness of the therapy, it is equivalent in its significance to clinical criteria (V. V. Selivanov, A. S. Mikhailova in co-workers, 2011). A high level of quality of life is an unconditional criterion for the harmonious functioning of the individual and her psychological health [5].

When considering QOL patients, it is necessary to evaluate the pleasure of those aspects of life that are affected by the disease and its treatment [4]. That is why in our study we used the questionnaire PedsQL 4.0 – Pđiatric Quality of Life Questionnaire that translated into 22 languages and adapted for children and adolescents aged 2 to 18 years [11]. This questionnaire contains questionnaires for children of different age groups (2–4 years, 5–7 years, 8–12 years and 13–18 years) and their parents. School-age children with CHF I–II A of the stages participating in our study responded to 23 questionnaires that were divided into 4 blocks relating to the physical, emotional, social functioning and functioning of the child in school. Similar blocks of questions were also raised by parents in the questionnaire QOL about their child. The results of the questionnaire survey are presented in scores from 0 to 100 both for each block and in general.

Questioning was conducted twice: before the beginning of the experiment and after the lessons on the developed program of physical rehabilitation. Results of the survey on the blocks of information (report) from children and their parents before and after the experiment are presented in Table 1.

As you can see, all the changes that are established in children of the EG have a statistically significant improvement.

Dynamics of indicators (improvement and deterioration), held among children of CG, is not reliably confirmed, as well as information from parents on the QOL of their children. According to the report of the children of the EG, their physical functioning improved by  $6,05 \pm 1,52$  points, and according to their parents – on  $11,33 \pm 4,32$  points. It is the physical functioning according to the parents' information that has the greatest improvement, graphically depicted in Figure 1. This block of the questionnaire indicates how much the state of health limits its physical activity and the performance of various physical activities (self-service, walking, running, carrying weight, etc.).



**Fig. 1. Results of the questionnaire on the quality of life (on the report of children (a) and information from parents (b)):**

PF – physical functioning, EF – emotional functioning, SF – social functioning, FS – functioning in school.

On the emotional and social functioning of EG children, it was they who had more improvement in the children's report, where the increase was  $7,81 \pm 3,23$  points in each block. Parents noted an increase of  $6,25 \pm 1,91$  and  $9,69 \pm 3,11$  points, respectively, of the QOL questionnaire of their child. This indicates an improvement in the social adaptation of children in society, in particular among peers.

However, despite an increase of  $7,5 \pm 2,7$  points on the questionnaire of the parents of children in the EG in the unit of functioning in the school, this indicator remains low. This is due to missing the school for the poor health of the children, visiting the doctor during the lessons, etc.

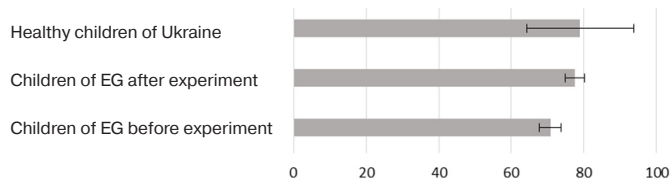
Analyzing the level of QOL (end result), we can observe its

**Table 1**  
Dynamics of indicators of quality of life of children with CHF I-II A stages, points

Indicators	Experimental group (n=16)		Control group (n=18)		
	before	after	before	after	
child report	physical functioning	75,2±2,76	81,25±2,92*	70,83±2,02	72,4±2,28
	emotional functioning	62,81±4,96	70,63±5,14*	67,22±3,06	66,67±3,1
	social functioning	74,38±4,78	82,19±3,62*	78,33±3,13	80,83±2,81
	functioning in school	67,81±3,71	73,75±3,67*	61,67±2,68	65±2,68
	QOL result	70,72±2,98	77,51±2,64**	69,69±1,66	71,38±1,93
parents report	physical functioning	65,43±5,58	76,76±3,87**	63,72±3,24	63,89±2,92
	emotional functioning	60±3,48	66,25±3,55**	58,89±2,9	58,33±2,32
	social functioning	70,63±4,23	80,31±3,97**	71,39±3,72	72,5±3,34
	functioning in school	58,13±4,67	65,65±3,56*	63,06±3,08	63,89±3,17
	QOL result	63,79±3,64	72,83±2,98**	64,19±2,34	64,55±2,06

Note. \* –  $p < 0,05$ , \*\* –  $p < 0,01$  when comparing the final parameters of the experimental group and the control group.

growth by  $6,79 \pm 1,4$  points according to the opinion of the children of EG and by  $9,04 \pm 2,18$  points according to information from parents. It should also be noted that the fathers estimated the QOL of their children with less points both before and after the experiment. According to research by Y. Pavlova (2015) [10], quality of life of healthy Ukrainian schoolchildren is  $78,9 \pm 14$ , points, and in children of the EG after training in the developed program of physical rehabilitation, QOL has grown to  $77,51 \pm 2,64$  points, which is close to the value of healthy peers (Figure 2).



**Fig. 2. Quality of life of healthy children and children EG with CHF**

So, one of the criteria for the effectiveness of the implemented physical rehabilitation program for school-age children with CHF I–IIA stages is the quality of life.

## Conclusions

1. Quality of life in children with CHF is an important integral indicator and an objective criterion of the effectiveness of the therapy.

**Conflict of interests.** The authors declare that no conflict of interest.

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2. Evaluating the quality of life of school-age children with a CHF of I–IIA stages showed a significant improvement in four blocks. Physical functioning in the opinion of children improved from 75,2 to 81,25 points, and according to their parents – from 65,43 to 76,76 points. It is the physical functioning according to the parents' information that has had the greatest improvement. Emotional functioning improved according to the data of the children of the EG and, according to their parents, from 62,81 to 70,63 and from 60 to 66,25, respectively. Social functioning is also a little positive effect on 74,38 to 82,19 points according to the data of the children's EG report and from 70,63 to 80,31 points according to information from parents. This indicates an improvement in the social adaptation of children in society, in particular among peers. Functioning of the child in the school from 67,81 points increased to 73,75 points in the children of the EG, and according to the parents of growth there was from 58,13 to 65,65 points. Despite the increase, this indicator remains low. This is due to missing the school for the poor health of the children, visiting the doctor during the lessons, etc.

3. Positive and negative dynamics of QOL children of CG for block indicators is not reliably confirmed.

**A prospect for further research is** to check the effectiveness of the developed PR program on other criteria, as well as to monitor the dynamics of the quality of life of children with CHF.

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