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Оригинальные исследования

Каніщева О. В., Шоп І. В., Тихонова Т. М., Іманова Н. І., Починська М. В.

Особливості варіабельності артеріального тиску у хворих на артеріальну гіпертензію на тлі різних режимів гіпотензивної терапії

Єгорова М. С., Краснєнков Д. С., Гурьянов В. Г., Кондратюк В. Є.

Дослідження діагностичного значення довжини теломер у пацієнтів із церебральним атеросклерозом

Никоненко О. С., Никоненко А. О., Чмуль К. О., Осауленко В. В.

Оцінювання ступеня кальцинозу коронарних артерій методом МСКТ серця в пацієнтів із порушенням метаболізму вітаміну D і гомоцистеїну

Орленко В. Л., Тронько М. Д.

Клінічні та біохімічні маркери ураження суглобів у хворих на цукровий діабет

Федоренко С. М., Вітомський В. В., Лазарева О. Б., Дорошенко Е. Ю., Вітомська М. В., Онопрієнко І. В.

Якість життя за EQ-5D-5L та особливості її динаміки в пацієнтів ортопедичного профілю амбулаторної програми фізичної терапії

Фищенко Я. В., Рой І. В., Кравчук Л. Д., Жарова І. А.

Метод епидурального адгезіоліза в ліченні нейрокомпрессионного болючого синдрому пояснично-крестцового відділу позвоночника

Швець А. В., Подолян Ю. В., Голінько М. І.

Особливості відновлення функціонального стану військовослужбовців після черепно-мозкової травми, що поєднана з акубаротравмою

Милиця М. М., Стеблянка В. В., Олійник Т. В.

Вплив інсулінорезистентності на перебіг післяопераційного періоду у хворих після накладання товстокишкового анастомозу

Кебало Д. І., Мирошникова Н. П., Шершнева О. П., Пашченко С. Н., Званцева Э. Д.

Діагностика предопухольових захворювань молочної залози

Марушко Ю. В., Злобинець А. С., Гичка С. Г., Гишчак Т. В., Хомич О. В., Гриневич І. В.

Клініко-інструментальні та морфологічні паралелі при поєднанні хронічного гастроудоденіту й первинної артеріальної гіпертензії в дітей

Original research

290

Kanishcheva O. V., Shop I. V., Tykhonova T. M., Imanova N. I., Pochynska M. V.

Some features of blood pressure variability in patients with arterial hypertension in various modes of antihypertensive therapy

296

Yehorova M. S., Krasnienkov D. S., Hurianov V. H., Kondratiuk V. Ye.

Study of the diagnostic significance of telomere length in patients with cerebral atherosclerosis

303

Nykonenko O. S., Nykonenko A. O., Chmul K. O., Osaulenko V. V.

The evaluation of the coronary arteries calcification degree by the method of cardiovascular MSCT in patients with vitamin D and homocysteine metabolism disturbance

309

Orlenko V. L., Tronko M. D.

Clinical and biochemical markers of joint damage in patients with diabetes mellitus

315

Fedorenko S. M., Vitomskiy V. V., Lazarieva O. B., Doroshenko E. Yu., Vitomska M. V., Onopriienko I. V.

Quality of life using the EQ-5D-5L and the features of its dynamics among the orthopedic profile patients in outpatient program of physical therapy

323

Fishchenko Ia. V., Roy I. V., Kravchuk L. D., Zharova I. O.

Method of epidural adhesiolysis in the treatment of neurocompression pain syndrome of the lumbosacral spine

329

Shvets A. V., Podolian Yu. V., Holinko M. I.

Features of functional state restoration among military personnel after traumatic brain injury combined with acubarotrauma

338

Mylytsia M. M., Steblianko V. V., Oliiynk T. V.

Influence of insulin resistance on postoperative period course in patients after colonic anastomosis

344

Kevalo D. I., Miroshnykova N. P., Shershniyova O. P., Pashchenko S. M., Zvantseva E. D.

Diagnosis of precancerous lesions of the breast

350

Marushko Yu. V., Zlobynets A. S., Hychka S. H., Hyshchak T. V., Khomych O. V., Hrynevych I. V.

Clinical, instrumental and morphological parallels in combination of chronic gastroduodenitis and primary hypertension in children

Оригинальные исследования

**Михалюк Є. Л., Сиволап В. В., Гуніна Л. М.,
Потапенко М. С., Аль Д. Каддах**

Асоціація ЕКГ-феноменів ранньої реполяризації і «Т-infantile» з вегетативною регуляцією серцевого ритму в юних спортсменів

Гребенюк Л. В.

Забезпеченість вітаміном D у дітей із назофарингеальними проявами гастроєзофагеальної рефлюксної хвороби

**Горбатюк О. М., Пащенко Ю. В., Момотов А. О.,
Пащенко К. Ю.**

Повторні хірургічні втручання в лікуванні гострого апендициту в дітей

Аряєв М. Л., Усенко Д. В.

Оцінювання та вибір режимів високочастотної осциляції грудної клітки в дітей із позалікарняною пневмонією на основі пульсоксиметрії

Возний О. В., Шумна Т. Є., Лепетченко Є. С.

Дослідження поширеності та інтенсивності карієсу в дітей із бронхіальною астмою

**Афанасьєва І. А., Хайтович М. В., Потаскалова В. С.,
Андрущенко І. В., Євмінов В. В., Куделя І. А.**

Поширеність патології постави в учнів (результати популяційного дослідження з використанням комп'ютеризованої фото-геометричної програми «Постава»)

Громова А. М., Бережна В. А.

Акушерські й антенатальні фактори ризику затримки внутрішньоутробного росту плода (ретроспективний аналіз)

Лінська К. І.

Час реакції респондентів на окремі пункти опитувальника Derogatis як діагностичний маркер депресивних розладів

Обзоры

**Солейко Д. С., Горбатюк О. М., Солейко Н. П.,
Солейко В. В.**

Сучасні принципи діагностики хвороби Крона в дітей

Матейко Г. Б., Веприк Т. В., Горбаль Н. Б.

Лікування пацієнтів із герпетичною інфекцією за принципами доказової медицини

**Кухтенко Г. П., Попова Т. В., Гладух Є. В.,
Кухтенко О. С.**

Порівняльний аналіз карбомерних полімерів для фармацевтичної та косметичної практики

Original research

356

**Mykhaliuk Ye. L., Syvolap V. V., Hunina L. M.,
Potapenko M. S., Al D. Kaddah**

Association of ECG early repolarization phenomena and “T-infantile” with autonomic regulation of the heart rhythm in young athletes

363

Hrebeniuk L. V.

Vitamin D status in children with nasopharyngeal manifestations of gastroesophageal reflux disease

371

**Horbatiuk O. M., Pashchenko Yu. V., Momotov A. O.,
Pashchenko K. Yu.**

Reoperations in the treatment of acute appendicitis in children

378

Aryayev M. L., Usenko D. V.

Evaluation and selection of high-frequency chest wall oscillation modes in children with community-acquired pneumonia based on pulse oximetry

384

Voznyi O. V., Shumna T. Ye., Lepetchenko Ye. S.

Prevalence and intensity study of dental caries in children with bronchial asthma

389

**Afanasieva I. O., Khaitovych M. V., Potaskalova V. S.,
Andrushchenko I. V., Yevminov V. V., Kudelia I. A.**

The prevalence of posture pathology in school-aged children (results of a population-based study with the use of the computerized photo-geometric program “Posture”)

395

Hromova A. M., Berezhna V. A.

Obstetric and antenatal risk factors for intrauterine growth restriction

402

Linska K. I.

Response time of respondents to separate points of the Derogatis questionnaire as a diagnostic marker of depressive disorders

Review

411

**Soleiko D. S., Horbatiuk O. M., Soleiko N. P.,
Soleiko V. V.**

Modern principles of Crohn’s disease diagnosis in children

420

Mateiko H. B., Vepryk T. V., Horbal N. B.

Treatment of patients with herpetic infection on the principles of evidence-based medicine

431

**Kukhtenko H. P., Popova T. V., Gladukh Ie. V.,
Kukhtenko O. S.**

Comparative analysis of carbomer polymers for pharmaceutical and cosmetic practice

Quality of life using the EQ-5D-5L and the features of its dynamics among the orthopedic profile patients in outpatient program of physical therapy

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of the article

Aim. To define the quality of life in outpatients with the orthopedic profile disorders and to study its dynamics during the physical therapy course depending on the disorder localization and psychotype.

Material and methods. The study involved 113 patients enrolled in a course of physical therapy at FESCO Medical Center in 2013–2015. Patients were grouped by the disorder localization and psychotype of the disease. The quality of life assessment was performed using the EQ-5D-5L questionnaire. The course of physical therapy consisted of 12–15 sessions (40–60 minutes; therapeutic physical exercises and mechanotherapy according to a complex ordered by a doctor), physiotherapy (magnetic therapy, electromyostimulation as instructed) and massage (7–8 procedures). The course duration was 5–6 weeks.

Results. Statistically worse initial results were found in patients with lumbar disorders, disorders in the pelvic girdle and the lower extremity on the “mobility”, “pain/discomfort”, and EQ-VAS scales compared with patients who had upper-body disorders. Differences in “anxiety/depression” and EQ-VAS scales were obtained when dividing patients according to a psychotype. In patients with rational disease perception, the analysis of dynamics revealed better changes and final results on the “anxiety/depression” scale compared with the group of irrational psychotypes. The dynamics on other scales also showed benefits in patients with rational disease perception, although no significant.

Conclusions. The data obtained indicate that not only localization but also features of disease perception affect the quality of life and the effectiveness of physical therapy. The prospects for further research are identifying directions to improve the dynamics through the introduction of new physical therapy tools and methods of their use as well as techniques of managing the physical therapy process.

Key words:

physical rehabilitation, therapeutic exercises, activity, patient participation, functioning, musculoskeletal disorders.

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Якість життя за EQ-5D-5L та особливості її динаміки в пацієнтів ортопедичного профілю амбулаторної програми фізичної терапії

С. М. Федоренко, В. В. Вітомський, О. Б. Лазарева, Е. Ю. Дорошенко, М. В. Вітомська, І. В. Оноприєнко

Мета роботи – визначити рівень якості життя в амбулаторних пацієнтів із порушеннями ортопедичного профілю та дослідити її динаміку за курс фізичної терапії залежно від локалізації порушення та психотипу.

Матеріали та методи. У дослідженні взяли участь 113 пацієнтів, котрі надходили на курс фізичної терапії в медичному центрі «ФЕСКО» впродовж 2013–2015 рр. Пацієнтів групували за локалізацією порушення та психотипом ставлення до хвороби. Якість життя оцінювали за опитувальником EQ-5D-5L. Курс фізичної терапії складався з 12–15 занять (40–60 хв; терапевтичні фізичні вправи та механотерапія за комплексом, що призначений лікарем), фізіопроцедур (магнітотерапія, електроміостимуляція за призначенням лікаря) та масажу (7–8 процедур). Тривалість курсу – 5–6 тижнів.

Результати. Виявили статистично гірші початкові результати в пацієнтів із порушеннями в попереку, поясі нижньої кінцівки та самої вільної кінцівки у шкалах «мобільність», «біль/дискомфорт» і ВАШ порівняно з пацієнтами з порушеннями у верхній частині тіла. Під час поділу пацієнтів залежно від психотипу отримали відмінності у шкалах «тривога/депресія» та ВАШ. У пацієнтів із раціональним ставленням до хвороби аналіз показав кращу динаміку та остаточні результати за шкалою «тривога/депресія» порівняно з групою нерациональних психотипів. У динаміці за іншими шкалами також спостерігали перевагу в пацієнтів із раціональним ставленням до хвороби, але вони не були вірогідними.

Висновки. Результати свідчать: не тільки локалізація, але й особливості ставлення до хвороби впливають на якість життя та результативність фізичної терапії. Перспективи дальших досліджень полягають у визначенні шляхів покращення динаміки шляхом впровадження нових засобів фізичної терапії та методик їхнього використання, методів управління процесом фізичної терапії.

Ключові слова:

фізична реабілітація, лікувальні вправи, активність, участь хворого, функціонування, порушення опорно-рухового апарату.

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Качество жизни по EQ-5D-5L и особенности его динамики среди пациентов ортопедического профиля амбулаторной программы физической терапии

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Цель работы – определить уровень качества жизни у амбулаторных пациентов с нарушениями ортопедического профиля и исследовать его динамику за курс физической терапии в зависимости от локализации нарушения и психотипа.

Ключевые слова:

физическая реабилитация, лечебная гимнастика, деятельность, участие больного, функционирование, опорно-двигательные нарушения.

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Материалы и методы. В исследовании приняли участие 113 пациентов, которые поступали на курс физической терапии в медицинском центре «ФЕСКО» в течение 2013–2015 гг. Пациентов группировали по локализации нарушения и психотипу отношения к болезни. Качество жизни оценивали по опроснику EQ-5D-5L. Курс физической терапии состоял из 12–15 занятий (40–60 мин; терапевтические физические упражнения и механотерапия по комплексу, назначенному врачом), физиопроцедур (магнитотерапия, электромиостимуляция по назначению врача) и массажа (7–8 процедур). Продолжительность курса – 5–6 недель.

Результаты. Установлены статистически худшие начальные результаты у пациентов с нарушениями в пояснице, поясе нижней конечности и самой свободной конечности в шкалах «мобильность», «боль/дискомфорт» и ВАШ по сравнению с пациентами с нарушениями в верхней части тела. При разделении пациентов в зависимости от психотипа получены различия по шкалам «тревога/депрессия» и ВАШ. У пациентов с рациональным отношением к болезни анализ динамики показал лучшую динамику и заключительные результаты по шкале «тревога/депрессия» по сравнению с группой нерациональных психотипов. В динамике по другим шкалам также отмечены преимущества у пациентов с рациональным отношением к болезни, однако они не были достоверными.

Выводы. Результаты свидетельствуют, что не только локализация, но и особенности отношения к болезни влияют на качество жизни и результативность физической терапии. Перспективы дальнейших исследований заключаются в определении путей улучшения динамики за счет внедрения новых средств физической терапии и методик их использования, методов управления процессом физической терапии.

Musculoskeletal diseases and injuries, including rheumatic fever, are a major cause of disability [12, 18, 19]. In the World Health Organization Global Burden of Disease Study (2010), back pain was the main cause of people's limited capabilities for many years, neck pain was the fourth cause, and other musculoskeletal disorders ranked fifth. This rating has increased the importance of osteoarthritis, namely, it advanced from the 15th place in 1990 to the 11th in 2010 among the population in Western Europe [19].

Musculoskeletal disorders affect people by limiting their activity and participation [10], as well as society due to cases of job loss, economic impact (disability pensions, early retirement) and the increasing need for social support [6]. However, an obstacle to defining these diseases as a priority for the public health officials is that they are not considered to be fatal [9].

Musculoskeletal disorders are such an important component of human disease in working-age and geriatric populations that good statistics about these disorders are important for health care planning [8]. At the same time, the study on the dynamics of health-related life quality in the field of physical therapy is one of the key points in determining the effectiveness, and the study on the dynamics of recovery depending on the musculoskeletal system area and patient perception of the disease is a condition for qualitative changes in the content of physical therapy programs and the features of managing the physical therapy process [14].

Aim

The purpose was to define the quality of life in outpatients with the orthopedic profile disorders and to study its dynamics during the physical therapy course depending on the disorder localization and psychotype.

Materials and methods

The life quality assessment was performed using the international standardized questionnaire EQ-5D-5L [13]. The questionnaire consists of 2 parts. The first part presents 5 (five) sections that give an opportunity: to outline the problems associated with the possibility of moving in space (mobility); self-care, usual activities; to assess

the patient's ability to perform work, including housework, study, person's involvement in family or leisure activities; to determine the presence of pain or discomfort, as well as individual psychological problems at the individual level [1, 2]. These 5 (five) sections include: "Mobility"; "Self-care"; "Usual activities"; "Pain /discomfort"; "Anxiety/depression".

The new version of the EQ-5D-5L questionnaire differs from the previous one in option to rate each section on a 5-point scale: from no problem (1 point) to its extreme severity (5 points) [2]. The second part of the questionnaire is the EQ visual analogue scale (EQ VAS). It is a 20 cm vertical graduated line, on which "0" means the worst, and "100" – the best state of health [1, 2]. The questionnaire is filled in by respondents or patients on their own in 2–3 minutes, which is usually not difficult for them. Assessment of health status and quality of life (QOL) was performed at the time of the assessment [2].

Patients were grouped using the International Classification of Functioning (ICF). The technique of determining types of the disease perception [16] was used to test the suggestion about a patient's personality influence on the physical therapy effectiveness. Thus, illness was the second factor in grouping patients. It is worth noting that the standard course of physical therapy consisted of 12–15 sessions with a specialist in physical rehabilitation/physical therapist (40–60 minutes; therapeutic exercise and mechano-therapy according to the complex prescribed by a doctor), physiotherapy (magnetotherapy, electromyostimulation according to the medical prescription) and massage (7–8 procedures). The duration of the course was 5–6 weeks.

The study involved 113 patients enrolled in the course of physical therapy at FESCO Medical Center during 2013–2015.

According to the results of the ICF use, it was determined that patients should have been grouped according to their affected structure. Thus, G1 included patients with the following ICF codes: s740 – pelvic girdle structure; s750 – lower extremity structure; s760 – trunk structure. G2 included patients with ICF codes: s710 – head and neck structures; s720 – shoulder girdle structure; s730 – upper limb structure.

The decision of such division and grouping was also justified by the fact that, according to the component of ICF function, all patients had similar codes. In particular

b710 – joint mobility function; b715 – joint stability function; b730 – muscle strength function; b735 – muscle tone function; b740 – muscular endurance function. However, only G1 patients were characterized by the b770 code of the walking stereotype function.

When considering the activities and participation, namely the sections “mobility”, “self-care”, “housework”, it was concluded that the usage of the shoulder girdle, the upper extremity itself, as well as the trunk, pelvis and lower extremity was required for most types of activities. Therefore, the possible differences between the groups should have been carefully examined.

Based on these views on grouping patients, 55 patients were referred to the G1 and 58 patients – to G2.

The methodology for determining types of the disease perception was used to test the suggestion about a patient’s personality influence on the physical therapy effectiveness, rehabilitation and patient satisfaction [16].

According to the literature data [3,7], namely concerning the classification of the harmonic, ergopathic and anognostic types of the rational reaction, the total sample was divided into G+ (n = 58, rational types of reaction to the disease) and G– (n = 55, “irrational”) and G1 and G2 – into subgroups by psychotypes. Thus, G1+ and G2+ included rational types of reaction to the disease. In particular, G1+ included 28 patients (50.9 % of G1), and G2+ included 30 patients (51.7 % of G2). Others were included in G1– and G2–.

The materials of the study were processed in program of statistical analysis IBM SPSS 21. Mathematical processing of numerical data was performed with the help of variation statistics. Shapiro-Wilk test (W) was used to analyze the normality of quantitative indicators distribution. For quantitative indicators with normal distribution we found the mean value (\bar{x}) and square deviation (S). For non-normally distributed quantitative indicators, we found median (Me), quartiles (25 %; 75 %), x and S. A significance of differences was assessed with Student’s t-test (for independent or dependent groups providing normal distribution of the study results). For indicators with non-normal distribution, we used Wilcoxon’s criterion (for dependent groups) and Mann–Whitney U-test (for independent groups).

Results

Analysis of the QOL in groups of patients by location. It should be noted that according to the statistical analysis results of the EQ-5D-5L questionnaire data, significant differences between G1 and G2 groups which were obtained through localization of musculoskeletal disorders, were defined in three scales. Given that, the results on all scales did not correspond to the normal distribution in groups, in Table 1, Me (25; 75) and $\bar{x} \pm S$ were presented. The distribution was taken into account in the comparison of the results between the groups.

The first scale of the EQ-5D-5L questionnaire is “mobility” (it reflects the level of difficulty in walking). Low scores on this scale reflect the absence of walking difficulties. Assessment analysis of the “mobility” scale (Table 1) revealed Me (25; 75) in G1 at the level of 3 (3; 4) points, and the average result was 3.18 ± 0.67 points; and in G2 – 1 (1; 1) score and 1.14 ± 0.39 , respectively. The results obtained in the groups

Table 1. EQ-5D-5L quality of life indicators in groups of orthopedic profile patients depending on the disorder localization, points

QOL indicators		Groups	
		G1 (n = 55)	G2 (n = 58)
Mobility	Me (25; 75)	3 (3; 4)	1 (1; 1)**
	$\bar{x} \pm S$	3.18 ± 0.67	1.14 ± 0.39
Self-care	Me (25; 75)	3 (3; 4)	3 (3; 4)
	$\bar{x} \pm S$	2.89 ± 1.08	3.33 ± 0.51
Usual activities	Me (25; 75)	3 (3; 3)	3 (3; 3.25)
	$\bar{x} \pm S$	3.02 ± 0.68	3.02 ± 0.69
Pain/discomfort	Me (25; 75)	4 (3; 5)	3 (3; 4)**
	$\bar{x} \pm S$	3.87 ± 0.88	3.10 ± 0.64
Anxiety/depression	Me (25; 75)	3 (2; 3)	2.5 (2; 3)
	$\bar{x} \pm S$	2.75 ± 0.82	2.59 ± 0.70
EQ VAS	Me (25; 75)	55 (45; 65)	60 (50; 70)*
	$\bar{x} \pm S$	53.91 ± 12.27	58.53 ± 12.46

*: the difference in the indicators between groups is statistically significant $P < 0.05$; **: $P < 0.01$.

differed significantly ($P < 0.01$). Thus, it can be argued that the “mobility” indicator was better in G2.

The limitations of self-care are reflected in the eponymous scale in the EQ-5D-5L questionnaire. Thus, in diseases and after injuries of the musculoskeletal system among patients entering the course of physical therapy at the outpatient stage, the possibilities of self-care did not meet the maximum. In particular, on the self-care scale in the groups G1 and D2, the indicators of Me (25; 75) were 3 (3; 4), and the indicators of $\bar{x} \pm S$ were slightly better in G1 and amounted to 2.89 ± 1.08 points and 3.33 ± 0.51 points, respectively. However, no statistical difference was defined ($P > 0.05$) between the groups on this scale.

Disorders and injuries of the musculoskeletal system affect the level of daily activities. Therefore, patients with these conditions can not fully perform normal activities, which affects the deterioration of the “usual activities” of EQ-5D-5L questionnaire scale. This scale is a subjective assessment of a patient’s degree of restriction in work, study, work at home, involvement in family affairs, leisure. The closer the index is to one, the better the result and less limited. The obtained statistical indicators in G1 and G2 did not differ significantly ($P > 0.05$), and the indicators of Me (25; 75) on the scale “usual activities” were 3 (3; 3) points and $\bar{x} \pm S$ were 3.02 ± 0.68 points in the general sample.

The next scale of the EQ-5D-5L questionnaire is “pain/discomfort”, which reflects the severity of pain and discomfort. Low scores on this scale reflect their absence. An analysis of the “pain/discomfort scale” (Table 1) revealed Me (25; 75) in G1 at the level of 4 (3; 5) points, and the average result was 3.87 ± 0.88 points; and in G2 – 3 (3; 4) scores and 3.10 ± 0.64 , respectively. The results obtained in the groups differed significantly ($P < 0.01$).

The “anxiety/depression” level in the EQ-5D-5L questionnaire is determined by the eponymous scale. Thus, on the “anxiety/depression” scale in the groups G1 and G2, the indicators of Me (25; 75) were 3 (2; 3) points and 2.5 (2; 3) points, and the indicators of $\bar{x} \pm S$ were 2.75 ± 0.82 points and 2.59 ± 0.70 points, respectively. There was no statistical difference between the groups on this scale ($P > 0.05$).

On the EQ VAS scale of the EQ-5D-5L questionnaire, which reflects a subjective health assessment at the time of completion, a statistically significant difference ($P < 0.05$) was found between groups G1 and G2. So, group G2

Table 2. EQ-5D-5L quality of life indicators in groups of patients depending on the psychotype, points

QOL indicators		Groups	
		G+ (n = 58)	G- (n = 55)
Mobility	Me (25;75)	2 (1; 3)	2 (1; 3)
	$\bar{x} \pm S$	2.07 ± 1.15	2.20 ± 1.18
Self-care	Me (25; 75)	3 (3; 4)	3 (3; 4)
	$\bar{x} \pm S$	3.05 ± 0.91	3.18 ± 0.82
Usual activities	Me (25; 75)	3 (3; 3)	3 (3; 4)
	$\bar{x} \pm S$	3.00 ± 0.65	3.04 ± 0.72
Pain/discomfort	Me (25; 75)	3 (3; 4)	3 (3; 4)
	$\bar{x} \pm S$	3.40 ± 0.88	3.56 ± 0.83
Anxiety/depression	Me (25; 75)	2 (2; 3)	3 (3; 4)**
	$\bar{x} \pm S$	2.21 ± 0.52	3.15 ± 0.68
EQ VAS	Me (25; 75)	65 (55; 70)	55 (45; 60)**
	$\bar{x} \pm S$	62.07 ± 11.70	50.18 ± 10.36

*: the difference in the indicators between groups is statistically significant $P < 0.05$;
 **: $P < 0.01$.

Table 3. Statistical differences in groups, taking into account two factors of patient grouping, points

QOL indicators		Groups	
		G1+ (n = 28)	G2+ (n = 30)
Mobility	Me (25; 75)	3 (3; 4)	1 (1; 1)**
	$\bar{x} \pm S$	3.11 ± 0.69	1.1 ± 0.4
Pain/discomfort	Me (25; 75)	3 (3; 5)	3 (3; 3.25)**
	$\bar{x} \pm S$	3.79 ± 0.92	3.03 ± 0.67
		G1- (n = 27)	G2- (n = 28)
Mobility	Me (25; 75)	3 (3; 4)	1 (1; 1)**
	$\bar{x} \pm S$	3.26 ± 0.66	1.18 ± 0.39
Pain/discomfort	Me (25; 75)	4 (3; 5)	3 (3; 4)**
	$\bar{x} \pm S$	3.96 ± 0.85	3.18 ± 0.61
EQ VAS	Me (25; 75)	50 (40; 55)	55 (46.3; 60)*
	$\bar{x} \pm S$	47.59 ± 10.23	52.68 ± 10.05

*: the difference in the indicators between groups is statistically significant $P < 0.05$; **: $P < 0.01$.

had better Me (25; 75) 60 (50; 70) scores, with $\bar{x} \pm S$ at 58.53 ± 12.46 points, provided that 100 points corresponded to the best possible level of health. And the G1 group had slightly lower Me (25; 75) – 55 (45; 65) scores, with $\bar{x} \pm S$ at 53.91 ± 12.27 points.

QOL analysis in groups of patients by psychotype. Taking into account the results of the analysis of QOL indicators according to EQ-5D-5L questionnaire, it was agreed to study the data obtained on the presence of significant differences in groups depending on the psychotype. Table 2 shows the results of the comparison between G+ and G–, since the differences between these groups were similar to that when comparing G1+ with G1– and G2+ with G2–, and only two of the six scales differed significantly when comparing G1+ and G2+ and three when comparing G1– and G2–. In addition, the differences identified will be discussed in more detail. The results of the groups were compared based on the distribution.

The statistical analysis revealed no significant differences in the results of the G+ and G– groups on the “mobility” scale ($P > 0.05$). Thus, the indicators of Me (25; 75) in G+ and G– were similar and amounted to 2 (1; 3) points, but indicators of $\bar{x} \pm S$ were slightly different and amounted to 2.07 ± 1.15 points and 2.20 ± 1.18 points, respectively. So, the advantage of the G+ group was not significant.

The statistical analysis results on the “self-care” scale were similar; no significant differences in the results of the G+ and G– groups were detected ($P > 0.05$). However, the indicators of Me (25; 75) and $\bar{x} \pm S$ in G+ were 3 (3; 4) and 3.05 ± 0.91 points, respectively, and these indicators in G– were 3 (3; 4) points and 3.18 ± 0.82 points, respectively.

Indicators on the “usual activities” scale were minimally worse in G- and this difference was not sufficient to establish a significant difference between the groups ($p > 0.05$). Me (25; 75) and $\bar{x} \pm S$ in G+ were 3 (3; 3) and 3.00 ± 0.65 points, respectively, and these indicators in G– were 3 (3; 4) and 3.04 ± 0.72 points, respectively.

The results obtained on the “pain/discomfort” scale were slightly worse in G-, but this difference was not sufficient to establish the statistical difference between the groups ($P > 0.05$). Thus, the values of Me (25; 75) in G+ and G– were similar and amounted to 3 (3; 4) points, but $\bar{x} \pm S$ were slightly different and amounted to 3.40 ± 0.88 points and 3.56 ± 0.83 points, respectively. Thus, the advantage of the G+ group was not significant.

A significant difference between G+ and G- was found on the “anxiety/depression” scale. Thus, the score on the scale was better ($P < 0.01$) in G+, and the indicators of Me (25; 75) in G+ and G– were 2 (2; 3) points and 3 (3; 4) points, respectively. The difference between the average values of the groups was 0.94 points, which was a significant difference when considering the features on the rating scale. Thus, patients with rational perception of the disease had better subjective levels of anxiety and depression.

The statistical difference between G+ and G– was also obtained on the EQ VAS scale of the EQ-5D-5L questionnaire, which reflects a subjective health assessment at the time of its completion. Thus, the score on the scale was statistically higher ($P < 0.01$) in G+, and the values of Me (25; 75) in G+ and G– were 65 (55; 70) points and 55 (45; 60) points, respectively, provided that 100 points corresponded to the best possible level of health. The $\bar{x} \pm S$ indicators were 62.07 ± 11.70 points and 50.18 ± 10.36 points, respectively. The difference between the mean values of the groups was 11.89 points. Thus, patients with rational perception of the disease (G+) rated their health status better than patients in group G–.

When comparing patients with rational psychotypes, statistical differences were found on the scales of “mobility” ($P < 0.01$) and “pain/discomfort” ($P < 0.01$) between the groups with lesions in the lower (G1+) and upper (G2+) parts of the body (Table 3). Thus, on the “mobility” scale, Me (25; 75) in G1+ were worse than in G2+, and the statistical indicators were the following: 3 (3; 4) points in G1+ and 1 (1; 1) point in G2+. The difference between the mean values of the groups on this scale was 2.01 points, and the $\bar{x} \pm S$ were 3.11 ± 0.69 points and 1.1 ± 0.4 points, respectively. In addition, the G1+ group had significantly better “pain/discomfort” scores: G1+ had 3 (3; 5) and G2+ had 3 (3; 3.25) points ($P < 0.01$). The difference between the mean values of the groups on the “pain/discomfort” scale was 0.76 points, and the $\bar{x} \pm S$ were 3.79 ± 0.92 points and 3.03 ± 0.67 points, respectively.

When comparing patients with irrational psychotypes, statistical differences were found on the scales “mobility” ($P < 0.01$), “pain/discomfort” ($P < 0.01$) and EQ VAS ($P < 0.05$) between groups with lower – (G1–) and up-

per-body (G2-) disorders (Table 3). Thus, on the "mobility" scale, Me (25; 75) in G1- was worse than in G2-: 3 (3; 4) scores in G1- and 1 (1; 1) score in G2- ($P < 0.01$). The difference between the average values of the groups on this scale was 2.08 points, and the $\bar{x} \pm S$ were 3.26 ± 0.66 points and 1.18 ± 0.39 points, respectively. However, the G1- group had significantly worse Me (25; 75) "pain/discomfort" scores: 4 (3; 5) scores among G1- patients and 3 (3; 4) scores among the G2- patients ($P < 0.01$).

The difference in mean values on the "pain/discomfort" scale was 0.78 points, and the $\bar{x} \pm S$ were 3.96 ± 0.85 points and 3.18 ± 0.61 points, respectively. A statistically significant difference was observed when comparing G1- and G2- on the EQ VAS scale: 50 (40; 55) points in G1- and 55 (46.3; 60) points in G2-. So, patients in the G1- group rated their health at a lower level. The difference in the mean values on the EQ VAS scale was 5.09 points, and the $\bar{x} \pm S$ were 47.59 ± 10.23 points in G1- and 52.68 ± 10.05 points in G2-.

QOL dynamics analysis in patient groups. Before considering the characteristics of the dynamics in the patient groups with lower-body and lumbar spine disorders (Table 4), we noted that all indicators of the EQ-5D-5L questionnaire had improved significantly over the standard course of physical therapy ($P < 0.01$). Table 4 presents the final indicators of $\bar{x} \pm S$, Me (25; 75) and the indicator of change in the average value among the groups with the lower-body disorders according to rational (G1+) and irrational (G1-) psychotypes, as well as the final comparison results of indicators taking into account the distribution.

Thus, the "mobility" scale improved statistically in both groups ($P < 0.01$). The average values on the scale in G1+ and G1- were decreased, 0.82 points and 0.63 points, respectively, (Table 4). Accordingly, the difference in the dynamics amounted to 0.19 points, which was 30.2 % of the increase in G1-. However, the changes were not statistically significant in G1+ ($P > 0.05$). At the same time, no statistically significant difference was found between the final Me (25; 75) values of groups: 2 (2; 3) points in G1+ and 3 (2; 3) points in G1- ($P > 0.05$). So, the difference between the final \bar{x} in G1+ and G1- was increased to 0.34 points.

The particular dynamics on the "self-care" scale in G1+ and G1- groups showed a decrease in the average values, 0.54 points and 0.52 points, respectively. Therefore, the difference between reductions was only 0.02 points, which was 3.8 % of the G1- decreasing. There were no statistically significant differences between the group final results of Me (25; 75) on the "self-care" scale: 2 (2; 3) scores in G1+ and 3 (2; 3) scores in G1- ($P > 0.05$). And the difference between the mean values of the final results in groups G1+ and G1- was 0.31 points.

According to the statistical analysis results, the particular dynamics on the "usual activities" scale were such that a decrease in the average values on the scale in G1+ and G1- was 0.64 points and 0.48 points, respectively. Thus, the difference in dynamics was 0.16 points, which was 33.3 % of the increase in G1-.

Therefore, the average value dynamics was more expressed in the group with rational psychotypes, but the advantage in this dynamics was not significant ($P > 0.05$). At the same time, no statistically significant difference was found between the final results of Me (25; 75) in the groups according to "usual activities" scale: 2 (2; 3) points in G1+

Table 4. EQ-5D-5L quality of life indicators in repeated surveying the patient groups with lower-body and lumbar spine disorders according to rational (G1+) and irrational (G1-) psychotypes, points

QOL indicators	Groups	$\bar{x} \pm S$	Δx	Me (25; 75)
Mobility	G1+	2.29 ± 0.66	-0.82	2 (2; 3)
	G1-	2.63 ± 0.74	-0.63	3 (2; 3)
Self-care	G1+	2.21 ± 0.74	-0.54	2 (2; 3)
	G1-	2.52 ± 0.80	-0.52	3 (2; 3)
Usual activities	G1+	2.32 ± 0.67	-0.64	2 (2; 3)
	G1-	2.59 ± 0.64	-0.48	3 (2; 3)
Pain/discomfort	G1+	2.57 ± 0.69	-1.21	3 (2; 3)
	G1-	2.89 ± 0.85	-1.07	3 (2; 4)
Anxiety/depression	G1+	1.21 ± 0.42	-1.04	1 (1; 1)**
	G1-	2.89 ± 0.42	-0.37	3 (3; 3)
EQ VAS	G1+	68.90 ± 10.03	8.93	70 (65; 75)**
	G1-	55.20 ± 8.93	7.59	55 (50; 60)

*: the difference in the indicators between groups is statistically significant $P < 0.05$; **: $P < 0.01$.

and 3 (2; 3) points in G1- ($P > 0, 05$). The difference between the average values of the final results in G1+ and G1- was 0.27 points.

The dynamics on the "pain/discomfort" scale showed statistically significant improvements in both groups ($P < 0.01$), as on the previous scales. A decrease in the average values of G1+ and G1- were 1.21 points and 1.07 points, respectively. Thus, the difference in dynamics was 0.14 points. That means, among patients with rational psychotypes, the "pain/discomfort" scale dynamics was better by 13.1 %, but the difference in dynamics did not lead to statistical differences in the Δx index. In addition, no statistically significant difference was found between the final Me (25; 75) in the groups: 3 (2; 3) points in G1+ and 3 (2; 4) points in G1- ($P > 0.05$). Therewith, the difference between the average values of G1+ and G1- groups increased slightly and amounted to 0.32 points.

The "anxiety/depression" scale, like all the scales, improved statistically in both groups with lower-body disorders ($P < 0.01$). A decrease in average values of G1+ and G1- were 1.04 points and 0.37 points, respectively. Accordingly, the difference in the rate of downgrading was 0.67 points, which was 181.1 % of the increase in G1-. It should be noted that the decrease was statistically greater in G1+ ($P < 0.01$). From that, among patients with rational psychotypes, the dynamics was significantly almost three times better. However, statistically significant differences were found between the final results of Me (25; 75) in the groups: 1 (1; 1) point and 3 (3; 3) points ($P < 0.01$), respectively.

According to the statistical analysis results, the dynamics on the EQ VAS scale of the EQ-5D-5L questionnaire was significant, as on the previous scales ($P < 0.01$). An increase in the average score in G1+ and G1- was 8.93 and 7.59, respectively. No differences in Δx were found ($P > 0.05$). The difference in growth amounted to only 1.34 points, which was 17.7 % of the increase in G1-. At the same time, statistically significant differences were found between the final results of Me (25; 75) in the groups G1+ and G1- on the EQ VAS scale, and the indicators were 70 (65; 75) points and 55 (50; 60) points ($P < 0, 01$), respectively. So, the difference between the average values of the final results in G1+ and G1- groups increased slightly and amounted to 13.7 points.

Table 5. EQ-5D-5L quality of life indicators in repeated surveying the patient groups with upper-body and lumbar spine disorders according to rational (G2+) and irrational (G2-) psychotypes, points

QOL indicators	Groups	$\bar{x} \pm S$	Δx	Me (25; 75)
Mobility	G2+	1.07 ± 0.25	-0.03	1 (1; 1)
	G2-	1.14 ± 0.36	-0.04	1 (1; 1)
Self-care	G2+	2.53 ± 0.63	-0.80	3 (2; 3)
	G2-	2.68 ± 0.77	-0.64	2.5 (2; 3)
Usual activities	G2+	2.37 ± 0.76	-0.67	2 (2; 3)
	G2-	2.39 ± 0.92	-0.61	2 (2; 3)
Pain/discomfort	G2+	2.20 ± 0.48	-0.83	2 (2.00; 2.25)*
	G2-	2.54 ± 0.58	-0.64	3 (2; 3)
Anxiety/depression	G2+	1.20 ± 0.41	-0.97	1 (1; 1)**
	G2-	2.54 ± 0.58	-0.50	3 (2; 3)
EQ VAS	G2+	73.00 ± 11.19	9.00	75 (67.5; 80.0)**
	G2-	60.9 ± 9.63	8.21	60 (55; 70)

*: the difference in the indicators between groups is statistically significant $P < 0.05$; **: $P < 0.01$.

Before considering the dynamics among the patient groups with upper-body disorders (Table 5), it should be noted that all the EQ-5D-5L questionnaire scores had improved significantly over the standard physical therapy course ($P < 0.01$), except the "mobility" scale. Table 5 presents the final indicators of $\bar{x} \pm S$, Me (25; 75) and the mean change among groups with upper-body disorders according to rational (G2+) and irrational (G2-) psychotypes, as well as the final results comparison based on the distribution.

Thus, the "mobility" scale did not change significantly in both groups ($P > 0.05$). A decrease in the average values on the scale in G2+ and G2- was insignificant and amounted to 0.03 points and 0.04 points, respectively (Table 5). Hence, the difference in the dynamics was minimal.

The particular dynamics on the "self-care" scale in G2+ and G2- groups reflected a 0.80 point and 0.64 point decrease in the average values, respectively. Therefore, the difference in reduction was only 0.16 points, which was 25 % of the increase in G2-. No statistically significant difference was found between the final group results of Me (25; 75) on the "self-care" scale: 3 (2; 3) points in G2+ and 2.5 (2; 3) points in G2- ($P > 0.05$). And the difference between the average values of G2+ and G2- final group results was 0.15 points.

According to the statistical analysis results, the particular dynamics on the "usual activities" scale were that a decrease in the average values on the scale in G2+ and G2- groups was 0.67 points and 0.61 points, respectively. Thus, the difference in dynamics was only 0.06 points, which was 9.8 % of the increase in G2-. Therefore, the dynamics of average value was more pronounced in the group with rational psychotypes, but an advantage of this dynamics was not insignificant ($P > 0.05$). Moreover, no statistically significant difference was found between the final results of Me (25; 75) in the "usual activities" groups: 2 (2; 3) points in G2+ and 2 (2; 3) points in G2- ($P > 0.05$).

The dynamics on the "pain/discomfort" scale showed statistically significant improvements in both groups ($P < 0.01$), as on the previous scales. A decrease in the average values on the scale reached 0.83 points and 0.64 points in G2+ and G2-, respectively. So, the difference in dynamics was 0.19 points. Besides, among patients with rational psychotypes, the dynamics on the "pain/discomfort" scale was better by 29.7 %, but this difference in the dynamics

did not lead to statistical differences in the Δx indicator. In addition, statistically significant differences were found between the final Me (25; 75) in the groups: 2 (2; 2.5) points in G2+ and 3 (2; 3) points in G2- ($P < 0.05$). At the same time, the difference between the mean values of G2+ and G2- groups increased slightly to 0.34 points.

The "anxiety/depression" scale, like all other scales, improved statistically in both groups with upper-body disorders ($P < 0.01$). A decrease in the average values on the scale was 0.97 points and 0.50 points in G2+ and G2-, respectively. Accordingly, the difference in reduction was 0.47 points, which was 94 % of the increase in G2-. It should be noted that the decrease was statistically larger in G2+ ($P < 0.01$). Thus, in patients with rational psychotypes, the dynamics was significantly better and almost doubled. However, statistically significant differences were found between the group final results of Me (25; 75): 1 (1; 1) points and 3 (2; 3) points ($P < 0.01$), respectively.

According to the results of the statistical analysis, the dynamics on the EQ VAS scale of the EQ-5D-5L questionnaire was as significant as on the previous scales ($P < 0.01$). An increase in average values on scales in G2+ and G2- were 9 points and 8.21 points, respectively. No differences in Δx were found ($P > 0.05$). The difference in the increase was only 0.79 points, which was 9.6 % of the increase in G2-. At the same time, statistically significant differences were found between the final results of Me (25; 75) in G2+ and G2- groups on the EQ VAS scale, and the indicators were 75 (67.5; 80) points and 60 (55; 70) points ($P < 0.01$), respectively. Thus, the difference between the average values of G2+ and G2- final results increased slightly to 9.1 points.

At the same time, it should be noted that comparing the dynamics based on disorders localization, the patients with lower-body disorders showed more pronounced dynamics on the scale of "mobility" and "pain/discomfort", while patients with upper-body disorders had more pronounced dynamics on the "self-care" scale.

Discussion

The study revealed differences in the initial results on the "mobility", "pain/discomfort" and EQ VAS scales between G1 and G2 groups (grouped by localization). It should be noted that all these differences confirmed worse results in patients with lumbar, pelvic girdle and the lower extremity disorders. The most pronounced difference was on the scale of "mobility", taking into account the peculiarities of scale assessment. Thus, the assumption about possible differences in the QOL depending on the localization of musculoskeletal disorder was substantiated.

When dividing patients based on the disease characteristics, we obtained statistical differences on the "anxiety/depression" and EQ VAS scales. It should be noted that the differences on the EQ VAS scale were more pronounced than when dividing groups based on the disorder localization.

Among patients with lower-body and lumbar spine disorders, dynamics analysis revealed statistically better changes and final scores on the "anxiety/depression" scale in G1+ group compared to the irrational psychotype group (G1-). The dynamics on other scales also showed advantages in G1+, but they were not significant. In the mean

time, the difference was significant on the EQ VAS scale between G1+ and G1–.

When comparing the final results of G2+ and G2–, a significant difference was observed on the “pain/discomfort”, “anxiety/depression”, and EQ VAS scales. Among patients with upper-body disorders, dynamics analysis revealed statistically better changes on the “anxiety/depression” scale in the group with rational disease perception (G2 +) compared to the group of irrational psychotypes (G2–). The dynamics on other scales also showed advantages in G1+, which were not significant.

The results of our work supplemented the data on the QOL in musculoskeletal disorders.

Thus, in the study of C. H. Roux and co-authors [15], the QOL dynamics among healthy patients and its change with the musculoskeletal disorders development was examined as well as a comparison of the QOL levels was done. In particular, the study showed the development of spine disorders (neck pain, back pain, disc herniation, osteoporosis (stress fractures)), joint disorders (osteoarthritis, microcrystalline arthritis, and arthritis), and extra-articular disorders (tendonitis, capsulitis and carpal tunnel syndrome).

A noteworthy detail is that the lowest scores were defined on the “viability” and “mental health” scales in all surveys. The authors pointed out that, compared to the control group, patients with disorders had significantly more serious reductions in the following indicators: somatic pain (–7.4 points difference in dynamics), vitality (–2.7), general health (–1.8) and physical functioning (–1.3). In the group of musculoskeletal disorders, chronic disorders had a greater impact than acute on physical functioning (–2.1), role emotional (–8.4), and social functioning (–5.9). However, it should be noted that the figures obtained were significantly lower. At the same time, the results of patients with musculoskeletal disorders presented by Roux C.H. and co-authors, much better than the results of a healthy population in Ukraine [5].

Picavet H. S. J. and Hoeymans N. in their study [11] reported that all diseases of the musculoskeletal system are associated with pain and physical function impairment, and the combination of musculoskeletal system diseases should be considered in studies and clinical practice because of their high occurrence and a significant impact on health-related QOL. At the same time, the authors examined the health-related QOL in healthy people and people with one or more musculoskeletal disorders using the SF-36 and Euroqol (EQ-5D) questionnaires. The sample included Dutch residents aged 25 years (n = 3664). Twelve descriptions of common musculoskeletal diseases were presented and the respondents were asked whether they had ever been told by a doctor that they had any of these. Their responses were used to evaluate the prevalence of these conditions. Thus, it was found that people with musculoskeletal disorders had significantly lower scores on all SF-36 scales than those without musculoskeletal disorders, especially for “physical functioning” (75.2 vs. 87.8); “the role of physical problems in limiting life” (67.1 vs. 85.8) and “pain” (68.5 vs. 84.1). The worst health-related quality of life indicators were found for osteoarthritis of the hip, osteoporosis, rheumatoid arthritis, and fibromyalgia. Those with multiple musculoskeletal disorders had the worst quality of life. Similar results were found for the EQ-5D questionnaire.

Similar to the previous comparison, our results were also lower than in the work of H. S. J. Picavet and N. Hoeymans [11]. This can be explained by the fact that, as mentioned, the quality of life of a healthy population in Ukraine [5] may be lower than among the population of others with the musculoskeletal disorders. Secondly, respondents with musculoskeletal pathologies in the study of H. S. J. Picavet and N. Hoeymans [11] were a sample of residents, and in our study, patients themselves sought the outpatient physical therapy program or were referred by a physician as they could not endure such pain any longer or due to limited mobility and activity, as is often happens, since the patients reported considerable periods of discomfort and limitations.

At the same time, there are a lot of papers in scientific bases dealing with the problems of quality of life in specific musculoskeletal diseases, but the results of mixed groups are less frequently reported.

Conclusions

The data obtained indicate that not only localization but also features of disease perception affect the quality of life and the effectiveness of physical therapy. Based on the results obtained in the physical therapy for patients with disorders in the lower body and lumbar part, considerable attention should be paid to their mobility. Special approaches should be applied to a patient in dealing with irrational disease perception, taking into account the higher level of anxiety and EQ VAS, which reflects a subjective assessment of health at the time of completion.

The prospects for further research are identifying directions to improve the dynamics through the introduction of new physical therapy tools and methods of their use as well as techniques of managing the physical therapy process. In particular, developments regarding improvement of the therapeutic alliance formation, patients and staff motivation, identification of ways to improve the quality of physical therapy services. Thus, recent articles [4, 17] have been published in this area and further work is underway.

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