Received: 02 December 2024 / Accepted: 29 February 2025 / Published online: 28 February 2025

DOI 10.34689/SH.2024.27.1.005

UDC 613.86:616.72-002:615.03

QUALITY OF LIFE AND ADHERENCE TO THERAPY IN PATIENT WITH RHEUMATOID ARTHRITIS

Yuliya V. Petrova[1], https://orcid.org/0000-0003-1910-7169
Raifa L. Ivanova[1], https://orcid.org/0000-0001-9851-2255
Maiya V. Goremykina[1], https://orcid.org/0000-0002-5433-7771
Talshyn K. Serikova[1], https://orcid.org/0009-0009-6840-1066
Aigerim B. Karakanova[1], https://orcid.org/0009-0008-2218-9082
Anel B. Bakytova[1], https://orcid.org/0009-0007-8804-4313
Danura S. Seitkhan[1], https://orcid.org/0009-0001-7447-8889
Maral G. Nogayeva[2], https://orcid.org/0000-0003-1182-5967

[1] NCJSC «Semey Medical University», Semey, Republic of Kazakhstan;
[2]NJSC «Kazakh National Medical University named after S.D. Asfendiyarov»,
Almaty, Republic of Kazakhstan.

Abstract

Relevance: Rheumatoid arthritis (RA) is a chronic inflammatory disease that leads to progressive joint damage and systemic complications. It significantly reduces patients' quality of life (QoL), affecting their physical, psychological, and social well-being. Assessing QoL is a crucial criterion for evaluating treatment effectiveness and requires the use of specialized instruments and questionnaires. This study **aims** to assess changes in QoL and treatment adherence among RA patients over one year of baseline therapy using the SF-36 and HAQ questionnaires.

Materials and Methods: A prospective observational study was conducted on 109 patients with a confirmed RA diagnosis (ACR/EULAR 2010 criteria). Enrollment took place in 2021, with reassessment after 12 months. Clinical parameters (DAS28, VAS), QoL measures (SF-36, HAQ), and treatment adherence (Morisky-Green questionnaire) were evaluated. Data analysis was performed using SPSS 26.0.

Results: The mean age of the patients was 56.3 years, with 77% being women. After one year of therapy, a statistically significant improvement in QoL was observed: the physical component of SF-36 (PCS) increased by 8.3 points, and the psychological component (MCS) increased by 10.6 points ($p < 0.001$). The HAQ index decreased by 0.4 points, indicating improved functional status. However, only 59.6% of patients demonstrated high adherence to treatment, while 40.4% had low adherence, which correlated with poorer QoL scores and higher disease activity.

Conclusions: High treatment adherence positively influences QoL and disease activity in RA patients. Additional strategies, including digital technologies, counseling, and personalized treatment approaches, are necessary to enhance adherence and optimize patient outcomes.

Keywords: *rheumatoid arthritis, quality of life, Health Assessment Questionnaire (HAQ), Medical Outcomes Study 36-Item Short Form (SF-36) adherence to therapy, Morisky-Green questionnaire.*

For citation:

Petrova Y.V., IvanovaR.L., Goremykina M.V., Serikova T.K., Karakanova A.B., Bakytova A.B., Seitkhan D.S., Nogayeva M.G. Quality of life and adherence to therapy in patient with rheumatoid arthritis // *Nauka i Zdravookhranenie* [Science & Healthcare]. 2025. Vol.27 (1), pp. 40-48.*doi 10.34689/SH.2024.27.1.005*

Резюме

КАЧЕСТВО ЖИЗНИ И ПРИВЕРЖЕННОСТЬ ТЕРАПИИ ПАЦИЕНТОВ С РЕВМАТОИДНЫМ АРТРИТОМ

Юлия В. Петрова[1], https://orcid.org/0000-0003-1910-7169
Райфа Л. Иванова[1], https://orcid.org/0000-0001-9851-2255
Майя В. Горемыкина[1], https://orcid.org/0000-0002-5433-7771
Талшын К. Серикова[1], https://orcid.org/0009-0009-6840-1066
Айгерим Б. Караканова[1], https://orcid.org/0009-0008-2218-9082
Анель Б. Бакытова[1], https://orcid.org/0009-0007-8804-4313
Данура С. Сейтхан[1], https://orcid.org/0009-0001-7447-8889
Марал Г. Ногаева[2], https://orcid.org/0000-0003-1182-5967

[1] НАО «Медицинский университет Семей», Семей, Республика Казахстан;
[2] НАО «Казахский национальный медицинский университет им. С.Д. Асфендиярова»,
г. Алматы, Республика Казахстан.

Актуальность: Ревматоидный артрит (РА) — это хроническое воспалительное заболевание, приводящее к прогрессирующему повреждению суставов и системным осложнениям. Оно значительно снижает качество жизни (КЖ) пациентов, затрагивая их физическое, психологическое и социальное благополучие. Оценка КЖ является важным критерием эффективности терапии и требует использования специализированных инструментов и опросников. **Цель** данного исследования — оценить динамику КЖ и приверженности терапии у пациентов с РА в течение одного года базисного лечения с использованием опросников SF-36 и HAQ.

Материалы и методы: проведено проспективное обсервационное исследование, включающее 109 пациентов с подтвержденным диагнозом РА (критерии ACR/EULAR 2010). Включение в исследование проводилось в 2021 году, повторная оценка осуществлялась через 12 месяцев. Оценивались клинические параметры (DAS28, VAS), показатели КЖ (SF-36, HAQ) и приверженность терапии (опросник Мориски-Грина). Анализ данных выполнялся с использованием программы SPSS 26.0.

Результаты: Средний возраст пациентов составил 56,3 года, 77% участников были женщины. Через год терапии было отмечено статистически значимое улучшение КЖ: физический компонент SF-36 (PCS) увеличился на 8,3 балла, а психологический компонент (MCS) — на 10,6 балла ($p< 0,001$). Индекс HAQ снизился на 0,4 балла, что свидетельствует об улучшении функционального состояния. Однако высокая приверженность терапии наблюдалась только у 59,6% пациентов, тогда как 40,4% имели низкую приверженность, что коррелировало с худшими показателями КЖ и большей активностью заболевания.

Заключение: Высокая приверженность терапии оказывает положительное влияние на КЖ и активность заболевания у пациентов с РА. Для повышения приверженности и оптимизации результатов лечения необходимы дополнительные стратегии, включая цифровые технологии, консультирование и персонализированные подходы к терапии.

Ключевые слова: *ревматоидный артрит, качество жизни, опросник оценки здоровья (HAQ), опросник SF-36, приверженность к терапии, опросник Мориски-Грина.*

Для цитирования:

Петрова Ю.В., Иванова Р.Л., Горемыкина М.В., Серикова Т.К., Караканова А.Б., Бакытова А.Б., Сейтхан Д.С., Ногаева М.Г. Качество жизни и приверженность терапии пациентов с ревматоидным артритом // Наука и Здравоохранение. 2025. Vol.27 (1), С.40-48.*doi 10.34689/SH.2024.27.1.005*

Түйіндеме

РЕВМАТОИДТЫ АРТРИТПЕН АУЫРАТЫН НАУҚАСТАРДЫҢ ӨМІР САПАСЫ ЖӘНЕ ТЕРАПИЯҒА БЕЙІМДІЛІГІ

Юлия В. Петрова[1], https://orcid.org/0000-0003-1910-7169
Райфа Л. Иванова[1], https://orcid.org/0000-0001-9851-2255
Майя В. Горемыкина[1], https://orcid.org/0000-0002-5433-7771
Талшын К. Серикова[1], https://orcid.org/0009-0009-6840-1066
Айгерим Б. Караканова[1], https://orcid.org/0009-0008-2218-9082
Анель Б. Бакытова[1], https://orcid.org/0009-0007-8804-4313
Данура С. Сейтхан[1], https://orcid.org/0009-0001-7447-8889
Марал Г. Ногаева[2], https://orcid.org/0000-0003-1182-5967

[1] «Семей медицина университеті» КеАҚ, Семей қ., Қазақстан Республикасы.
[2] «С. Ж. Асфендияров атындағы Қазақ ұлттық медицина университеті» ҚеАҚ,
Алматы қ., Қазақстан Республикасы.

Өзектілігі: Ревматоидты артрит (РА) – буындардың прогрессивті зақымдануы мен жүйелі асқынуларға әкелетін созылмалы қабыну ауруы. Ол пациенттердің өмір сүру сапасын (ӨС) айтарлықтай төмендетіп, олардың физикалық, психологиялық және әлеуметтік әл-ауқатына әсер етеді. ӨС бағалау терапияның тиімділігін анықтаудың маңызды критерийі болып табылады және арнайы құралдар мен сауалнамаларды қолдануды талап етеді. Осы **зерттеудің мақсаты** – SF-36 және HAQ сауалнамаларын қолдана отырып, РА-мен ауыратын пациенттердің ӨС динамикасын және терапияға бейімділігін бір жылдық базалық ем аясында бағалау.

Материалдар мен әдістер: ACR/EULAR 2010 критерийлеріне сәйкес РА диагнозы расталған 109 пациентті қамтыған проспективті бақылау зерттеуі жүргізілді. Пациенттер 2021 жылы зерттеуге енгізіліп, 12 айдан кейін қайта бағаланды. Клиникалық параметрлер (DAS28, VAS), ӨС көрсеткіштері (SF-36, HAQ) және терапияға бейімділік (Мориски-Грин сауалнамасы) бағаланды. Деректерді талдау SPSS 26.0 бағдарламасы арқылы жүргізілді.

Нәтижелер: Пациенттердің орташа жасы 56,3 жасты құрады, олардың 77%-ы әйелдер болды. Бір жылдық терапиядан кейін ӨС-тің статистикалық тұрғыдан маңызды жақсаруы байқалды: SF-36 физикалық компоненті (PCS) 8,3 баллға, ал психологиялық компоненті (MCS) 10,6 баллға артты ($p < 0,001$). HAQ индексі 0,4 баллға төмендеп, функционалдық жағдайдың жақсарғанын көрсетті. Алайда, тек 59,6% пациенттер терапияға жоғары бейімділік танытты, ал 40,4%-ында бейімділік төмен болды, бұл ӨС-тің нашарлауымен және ауру белсенділігінің жоғары болуымен өзара байланыста болды.

Қорытындылар: Терапияға жоғары бейімділік РА-мен ауыратын пациенттердің ӨС мен ауру белсенділігіне оң әсер етеді. Бейімділікті арттыру және емдеу нәтижелерін оңтайландыру үшін цифрлық технологияларды, кеңес беруді және жеке емдеу тәсілдерін қоса алғанда, қосымша стратегиялар қажет.

***Түйінді сөздер**: ревматоидты артрит, өмір сүру сапасы, денсаулықты бағалау сауалнамасы (HAQ), SF-36 сауалнамасы, терапияға бейімділік, Мориски-Грин сауалнамасы.*

Дәйексөз үшін:

Петрова Ю.В., Иванова Р.Л., Горемыкина М.В., Серикова Т.К., Караканова А.Б., Бакытова А.Б., Сейтхан Д.С., Ногаева М.Г. Ревматоидты артритпен ауыратын науқастардың өмір сапасы және терапияға бейімділігі // Ғылым және Денсаулық сақтау. 2025. Vol.27 (1), Б. 40-48. *doi 10.34689/SH.2024.27.1.005*

Introduction

Rheumatoid arthritis (RA) is a chronic immunoinflammatory disease characterized by erosive joint damage and systemic involvement of internal organs [4]. Studies have shown that the mortality rate in patients with RA is 54% higher than in the general population, and the risk of cardiovascular complications is doubled [24]. Furthermore, RA has a negative impact on patients' quality of life (QoL), potentially leading to early disability and reduced life expectancy [22, 23].

The QoL of patients with RA is a crucial integrative indicator that reflects not only physical health but also psychological well-being, social activity, and the ability to perform daily tasks [8]. Unlike objective clinical parameters, such as laboratory or instrumental data, QoL is based on patients' subjective perceptions, making it an essential criterion for evaluating treatment effectiveness [8].

Given the multifaceted nature of QoL, its assessment requires the use of validated questionnaires capable of capturing various aspects of patients' lives. In international practice, both disease-specific and generic scales are widely utilized [11, 12, 15].

The Health Assessment Questionnaire (HAQ) was specifically developed for RA patients and is designed to assess functional capacity [1]. It consists of 20 questions grouped into 8 categories, allowing for the calculation of the HAQ index (ranging from 0 to 3.0 points). Scores below 0.5 indicate normal functional ability, whereas an increase in the index reflects greater limitations in activity. A difference of 0.22 points is considered a minimally clinically significant improvement, while a reduction of 0.5 points or more signifies substantial functional enhancement.

Among the general assessment tools, the SF-36 (Medical Outcomes Study 36-Item Short Form) is the most frequently used [6]. The SF-36 questionnaire comprises 36 questions evaluating physical and psychosocial well-being across 8 scales. Two composite scores - the physical component summary (PCS) and the mental component summary (MCS) - enable comparison of a patient's condition with population norms and facilitate monitoring of treatment dynamics.

Recent studies emphasize the importance of regular QoL assessment in RA patients, as it is closely linked to disease activity, treatment efficacy, and prognosis [9, 16]. Lower QoL scores are associated with more severe disease progression, reduced adherence to therapy, and increased healthcare costs. Moreover, a decline in QoL may precede an exacerbation of inflammatory activity, making it a valuable prognostic marker [7].

Thus, the comprehensive assessment of QoL not only provides an objective evaluation of RA patients' health status but also allows for the individualization of therapeutic approaches, thereby enhancing overall treatment effectiveness. Integrating the HAQ and SF-36 questionnaires into clinical practice contributes to a more precise evaluation of patients' conditions and enables timely adjustments to treatment strategies.

Aim: to assess adherence to therapy and quality of life of patients with RA in dynamics (within one year) against the background of active baseline therapy using SF-36 and HAQ questionnaires.

Materials and methods

A prospective observational cross-sectional clinical study was conducted at the Cardio-Rheumatology Department of the University Hospital of NJSC "Semey Medical University" (UH NJSC "SMU") in Semey, Kazakhstan.

The study included 109 patients with a confirmed diagnosis RA in accordance with the 2010 ACR/EULAR classification criteria (American College of Rheumatology/European League Against Rheumatism Rheumatoid Arthritis Classification Criteria). Patients in the observation group were recruited consecutively upon admission between January 1 and December 31, 2021. A repeated assessment of all study parameters was conducted after 12 months. *Inclusion criteria*: verified RA according to the ACR/EULAR 2010 classification criteria and voluntary informed consent. *Exclusion criteria*: pregnancy and lactation, severe and decompensated liver, kidney, cardiovascular diseases, endocrine disorders, other joint diseases, age under 18 years, refusal to participate in the study,

Diagnostic Methods: The diagnosis of RA was established based on all necessary clinical and instrumental examinations following the protocol for the diagnosis and treatment of RA issued by the Ministry of Health of the Republic of Kazakhstan (2016) (M06.0; M05.8) [2]. The radiological stage of RA was determined using the modified Steinbrocker classification. RA activity was assessed using the Disease Activity Score for 28 joints based on the erythrocyte sedimentation rate (DAS28-ESR) at the time of inclusion in the study and again after 12 months.

The DAS 28-ESR includes the counting of painful and swollen joints (out of 28 possible joints), the level of an inflammatory marker (in this study, ESR) and the patient's subjective assessment of general health by VAS (0-100 mm). The result obtained is a numerical score interpreted as follows: DAS28 > 5.1 indicates high activity, 3.2-5.1 indicates moderate activity, 2.6-3.2 indicates low activity, and <2.6 indicates remission [2].

QoL indicators were assessed using the SF-36 questionnaire HAQ, both at baseline and at the 12-month follow-up visit, conducted by the same physician.

The SF-36 consists of 36 items grouped into eight domains: Physical Functioning (PF), Role Physical (RP) (role limitations due to physical health), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Role Emotional (RE) (role limitations due to emotional health), and Mental Health (MH). The results are presented as two summary scores: the Physical Component Summary (PCS), reflecting physical health, and the Mental Component Summary (MCS), reflecting mental health. Scores range from 0 to 100, with 100 indicating the best possible health status and 0 the worst. An increase of ≥5 points in PCS or MCS was considered an improvement, while an increase of ≥10 points was considered a significant improvement [6,16].

The HAQ measures the degree of disability and difficulty in performing activities of daily living. The questionnaire includes 20 questions in 8 categories: dressing, getting up, eating, walking, hygiene, reaching, grasping and activities of daily living. It is scored on a four-point scale (from 0 - no difficulty to 3 - inability to perform without assistance). A notable improvement was defined as a decrease in HAQ score by ≥0.5 points, while a substantial improvement was defined as a decrease of ≥0.8 points [1,26].

Adherence to treatment was assessed using the Morisky-Green questionnaire, which patients completed during the follow-up visit. This questionnaire comprises four questions designed to identify potential issues with medication adherence:

Do you ever forget to take your medication?

Do you have difficulty remembering to take your medications?

When you feel better, do you sometimes stop taking your medication?

If you feel worse after taking a medication, do you stop taking it?

Responses are scored on a binary scale: "yes" = 0 points, "no" = 1 point. The total score ranges from 0 to 4, with adherence levels classified as follows: 4 points - adherent, 3 points - insufficiently adherent (at risk of becoming nonadherent), and 1-2 points - nonadherent [20].

The efficacy of therapy was evaluated according to the EULAR criteria based on the dynamics of the DAS 28 index and using the ACR 20/ACR 50/ACR 70 response criteria. A decrease in DAS 28 level after 12 months from baseline of >1.2 was considered a "good response", >0.6 and ≤1.2 a "partial response", ≤0.6 from baseline a "poor response" (with moderate activity level) and "no response" with DAS 28 level above 5.1 [10]. According to the ASR criteria, a minimal improvement was considered to be an effect corresponding to a 20% improvement in the following parameters: counting of painful and swollen joints and any 3 of the following 5 parameters: patient's overall assessment of disease activity, physician's overall assessment of disease activity, VAS, HAQ, ESR or CRP, a moderate effect of 50%, and a significant effect of 70% [27].

All patients signed informed voluntary consent for participation in the study, processing, and publication of personal data. The study was approved by the local ethical committee of NJSC "SMU" (protocol No. 2 of 28.10.2020).

Statistical data analysis was performed using SPSS software version 26.0. For descriptive statistics, continuous variables were presented as mean ± standard deviation or median (25th and 75th percentiles), depending on the data distribution. Comparisons of mean values between groups were conducted using Student's t-test for normally distributed data and the Mann–Whitney U test for non-normally distributed data. To assess changes within groups over time, the paired t-test or Wilcoxon signed-rank test was applied. Effect size (Cohen’s d) was calculated as the ratio of the difference in mean values before and after therapy to the standard deviation of the baseline measurement. The interpretation of effect size was as follows: less than 0.2 – no effect, 0.2 to 0.5 – minimal effect, 0.5 to 0.8 – moderate effect, and greater than 0.8 – pronounced effect. Statistical significance was set at $p < 0.05$.

Results

*Demographic and clinical characteristics.*The mean age of the patients was 56.3 ± 12.4 years [min: 24; max: 87]. Among the patients, 77% (n=85) were female and 22% (n=24) were male. The majority of participants 81.7% (n=89) were of Kazakh ethnicity, while 18.3% (n=20) were of Russian ethnicity. The social status distribution was as follows: employed 20.2% (n=22), unemployed 21.1% (n=23), retired 28.4% (n=31). One third of the patients had a disability 30.3% (n=33). Demographic and clinical characteristics of the patients are presented in Table 1.

In the study group, patients with seropositive rheumatoid arthritis predominated, accounting for 68.8% (n=75). The majority of patients were in the advanced (33.9%, n=37) or late (47.7%, n=52) stages of the disease. Radiological stages II and III were the most common, observed in 35.8% (n=39) and 34.9% (n=38) of cases, respectively. Joint function impairment was classified as grade II in 36.7% (n=40) of patients and grade III in 52.3% (n=57). The mean DAS28 was 5.08 ± 1.4 [min: 2.65; max: 8.06]. Anemia was the most frequently diagnosed systemic manifestation, affecting 50.5% (n=55) of patients. RA-related complications were identified in 14.7% (n=16) of cases, with osteoporosis (87.5%, n=14) being the most prevalent. Among comorbidities, arterial hypertension (65.1%, n=71) and gastrointestinal disorders (56.3%, n=40) were the most common.

All patients in the study group (109 patients) were receiving baseline therapy at the time of inclusion in the study. Table 2 presents data on the treatment of patients, including baseline therapy, biologics and glucocorticosteroid use.

Among the baseline drugs, methotrexate (MTX) was used in the majority of cases - 62.4% (n=68) of patients, mostly in parenteral form with a mean dose of 13.6± 2.9 mg [min: 10; max: 20]. Biological therapy was used in 16.5% (n=18) of patients, of which golimumab was received by 13.8% (n=15) and tocilizumab by 2.8% (n=3). Glucocorticosteroids were prescribed in 46.8% (n=51) of cases.

Table 1.

Demographic and clinical characteristics of patients with rheumatoid arthritis.

Demographic characteristics		N	%
Age,years, M ± SD		56.3±12.4 [min: 24; max: 87]	
Gender	Women	85	77
	Men	24	22
Nationality	Kazakh	89	81.7
	Russian	20	18,3
Socialstatus	Employed	22	20,2
	Unemployed	23	21,1
	Pensioners	31	28,4
	Disable	33	30,3
Clinicalcharacteristics	Seropositive	75	68,8
	Seronegative	34	31,2
Duration of disease, years, Me [Q1; Q3]		10 [3; 25]	
Stageofdisease	Veryearly	5	4,6
	Early	15	13,8
	Advanced	37	33,9
	Late	52	47,7
Radiologicalstage	I	13	11,9
	II	39	35,8
	III	38	34,9
	IV	19	17.4
Functionalclass	I	12	11,0
	II	40	36,7
	III	57	52,3
DAS 28, M ± SD		5.08 ± 1.4 [min: 2.65; max: 8.06]	
Of which:	**Systemic manifestations**	55	50,5
	Anaemia	51	92,7
	Rheumatic nodules	4	7.3
	Fever	3	5,5
	Weight loss	3	5,5
	Others	5	9,1
Of which:	**Complications**	16	14,7
	Osteoporosis	14	87,5
	Others	10	62,5
Co-morbidities Of which:	Arterial hypertension	71	65,1
	Coronary artery disease	39	54,9
	Osteoarthritis	13	18,3
	Gastrointestinal pathology	40	56,3
	Others	17	23,9

Table 2.

Characteristics of the therapy administered to patients with rheumatoid arthritis.

Typeoftherapy	N	%
Baseline	109	100
Methotrexate, of which Parenteral (s/c)	68 54	62,4 79,4
Leflunomide	37	33,9
Sulfasalazine	2	2,2
Hydroxychloroquine	2	2,2
Methotrexate + Leflunomide	9	8,4
Biological	18	16,5
Golimumab	15	13,8
Tocilizumab	3	2,8
Glucocorticosteroids	51	46,8

Quality of life assessment. At the time of inclusion in the study, patients with RA demonstrated relatively poor quality of life on most of the SF-36 scales (Table 3). The sum of physical scales was significantly lower than the normative values PCS = 38.0 ± 6.3, with the most pronounced limitations observed for RP = 32.2 ± 11.4 and BP 37.2 ± 13.8. Psycho-emotional state of patients was also moderately reduced, MCS was 57.6 ± 7.7.

After 12 months of follow-up, a significant improvement in functional indices was observed following treatment. PCS - SF-36 increased by 8.3 ± 6.2, $d = 1.3$ ($p < 0.001$), indicating a clinically meaningful enhancement of physical health and a reduction in pain. MCS - SF-36 also showed a significant increase of 10.6 ± 7.7, $d = 1.4$ ($p < 0.001$), reflecting a positive impact of therapy on patients' psycho-emotional well-being.

Analysis of individual physical health parameters revealed a statistically significant improvement in physical functioning Δ PF = 10.0 ± 8.2, $d = 1.2$, ($p < 0.001$) and role-physical functioning Δ RP = 9.6 ± 8.2, $d = 1.2$, ($p < 0.001$), suggesting an enhanced ability of patients to perform daily physical activities. A statistically significant reduction in bodily pain (BP) by 6.7 ± 8.3 points, $d = 0.8$ ($p < 0.001$), was also noted, although the effect size was moderate.

Table 3.

Quality of life indicators in patients with rheumatoid arthritis.

Qualityoflifeindicators	At the beginning of treatment		Indynamicsafter 12 months		Differenceaverages(Δ)	Effect size (Cohen's d)(d)
	M ± SD	Range [min; max]	M ± SD	Range [min; max]		
Physicalcomponentsummary	38.0 ± 6.3	-	46.3 ± 8.9	-	+8.3 ± 6.2*	1.3
Physicalfunctioning	40.2 ± 13.8	15; 65	50.2 ± 14,5	20; 80	+10.0± 8.2*	1.2
Rolephysical	32.2 ± 11.4	10; 55	41.8 ± 14.2	20; 75	+ 9.6 ± 8.2*	1.2
Bodilypain	37.2 ± 13.8	15; 60	43,9 ± 15.8	20; 80	+6.7± 8.3*	0.8
Generalhealth	42.3 ± 12.2	20; 65	49.2±13.0	20; 78	+6.9± 9.9*	0.6
Mentalcomponentsummary	57.6 ± 7.7	-	68.3± 7.3	-	+10.6 ± 7.7*	1.4
Vitality	48.8 ± 12.9	25; 75	58,6 ± 15.0	30; 80	+ 9.8 ± 18.7*	0.5
Social	55.4 ± 13..4	30; 80	62,9 ± 12.2	35; 85	+7.5 ± 16.6*	0.5
Roleemotional	60.4 ± 16.3	35; 85	74,0 ± 15,1	35; 90	+13.6± 14.1*	0.9
Mentalhealth	65.9 ± 15.5	35; 90	77,5 ± 14,5	45; 95	+11.7 ±9.7*	1.2
HAQ	2.0 ± 0.6	-	1.5 ± 0.8	-	-0,4 ± 0,4*	0.9
*p< 0.05						

Note: HAQ – Health Assessment Questionnaire.

Notable improvements were also observed in the mental health component: RE increased by 13.6 ± 14.1, d = 0.9, MH improved by 11.7 ± 9.7, d = 1.2 ($p < 0.001$), indicating reduced emotional distress and overall enhancement of psychological well-being following long-term RA therapy.

Despite the overall positive trend, less pronounced changes were recorded in general health Δ GH = +6.9 ± 9.9, d = 0.6, vitality Δ VT =+9.8 ± 18.7, d = 0.5 and social functioning Δ SF= +7.5 ± 16.6, d = 0.5, which may be attributed to individual differences in patient adaptation and variability in their perception of QoL. Nevertheless, the increase in these scores indicates a positive trajectory ($p < 0.001$).

Of particular note is the decrease in HAQ score (-0.4 ± 0.4, d = 0.9). Although the reduction in HAQ was statistically significant ($p < 0.001$), it did not reach the threshold for clinical significance (Δ ≥ 0.5), indicating persistent limitations in daily activities.

*Adherence to treatment.*When adherence was assessed using the Morisky-Green questionnaire, only 59.6% (n=65) of patients demonstrated high adherence to therapy (4 points), while 20.4% (n=22) had low adherence (3 points), and 20.4% (n=22) exhibited insufficient adherence (1–2 points). An analysis of the clinical and laboratory characteristics of patients with different adherence levels (Table 4) revealed that patients with low adherence were significantly older, with a mean age of 57.4 ± 13.0 years compared to 51.9 ± 11.0 years in the high-adherence group ($p < 0.001$), suggesting that older patients may face greater challenges in maintaining adherence.

Despite a similar disease duration in both groups ($p = 0.582$), patients with low adherence exhibited significantly higher inflammatory activity, as indicated by elevated DAS28 scores—5.45 [4.9; 6.1] vs. 4.84 [4.1; 5.5] ($p = 0.025$). Additionally, patients with low adherence reported more severe pain, as reflected in significantly higher VAS scores ($p = 0.034$), which likely contributed to decreased motivation for regular medication intake.

Functional status, assessed using the HAQ scale, was also significantly worse in the low-adherence group, with scores of 2.0 ± 0.6 vs. 1.5 ± 0.8 in the high-adherence group ($p = 0.048$), indicating a greater degree of disability among these patients. (Table 4)

Table 4.

Clinical and laboratory characteristics of patients with rheumatoid arthritis depending on overall adherence to therapy.

Indicator	Committed to treatment (n=65)	Not committed to treatment (n=44)	p-value
Age, years	51.9 ± 11.0	57.4 ± 13.0	p < 0,001
Duration of the disease, years	9,8 [4; 22]	11,2 [5; 26]	p = 0,582
ESR, mm/hour	15,4 ± 9,2	20,8 ± 10,5	p = 0,069
CRP	10,1 ± 11,9	12,7 ± 11,5	p = 0,431
DAS28	4,84[4,1; 5,5]	6,45 [5,9; 8,06]	p < 0,001
Number of painful joints	14 [8; 16]	14 [9; 20]	p = 0,202
Number of swollen joints	5 [2; 7]	8 [5; 12]	p = 0,236
VAS, mm	64 [20; 80]	72 [60; 80]	p = 0,034
Morisky-Green scale, scores	3 [2; 4]	2 [1; 3]	p = 0,025
HAQ, scores	1,5 ± 0,8	2,0 ± 0,6	p = 0,048
PCS - SF-36, scores	46.4 ± 8.9	38,0 ± 6	p < 0,001
MCS -SF-36, scores	68,3 ± 7,3	57,6 ± 7,7	p < 0,001

Note: ESR - erythrocyte sedimentation rate, CRP- C- reactive protein, VAS - visual analogue scale, HAQ - health assessment questionnaire, PCS-SF 36 - physical component summary, MCS-SF 36 **-** mental component summary.

Comparison of the total physical and mental components of the SF-36 also showed a statistically significant difference between the high and low adherence groups ($p < 0.001$).

This emphasises not only the importance of adherence to therapy for disease control, but also its impact on patients' general well-being, social engagement and psychological well-being.

Discussion

The present study confirmed that adherence to therapy is a crucial factor in the management of RA, influencing both disease activity and patients' QoL. Patients with high adherence exhibited significantly lower DAS28 scores ($p = 0.025$), better functional status (HAQ, $p = 0.048$), and higher levels of both physical (PCS, $p < 0.001$) and mental (MCS, $p < 0.001$) well-being.

The findings of this study align with previous research. *Gadallah et al.,* 2014 demonstrated that patients with high adherence to methotrexate and biologic therapies were more likely to achieve remission and had superior functional outcomes as assessed by the HAQ and SF-36 scales. [28] Similarly, multiple studies (*Yajima et al.,* 2023; *Jarab et al.,* 2023) have reported that low adherence is associated with higher disease activity and poorer QoL scores [29, 30]. A noteworthy observation was that patients with low adherence were significantly older ($p = 0.002$). This finding is consistent with a study by *Siddique M. et al*., 2024 which indicated that older patients are less likely to adhere to treatment regimens due to factors such as multimorbidity, cognitive impairment, and the complexity of medication management. [5, 7, 30]. These findings highlight the necessity of developing individualized strategies to enhance adherence, particularly in older patients [31].

Despite the important insights gained, this study has certain limitations. Firstly, it was conducted within a single healthcare center, which may restrict the generalizability of the findings to a broader population. Secondly, adherence was assessed using the Morisky-Green questionnaire, a validated but self-reported measure that may introduce information bias. However, the combination of this tool with objective clinical parameters (DAS28, HAQ, SF-36) enhances the reliability of the results.

A key strength of this study is its comprehensive approach, incorporating a simultaneous assessment of adherence, disease activity, and quality of life, thereby providing a more precise understanding of the interconnections between these parameters.

Conclusions

This study highlights the significant impact of adherence to therapy on the QoL and disease activity in patients with RA. Over the course of a year, patients receiving baseline therapy demonstrated notable improvements in both physical and psychological health, as evidenced by increased SF-36 scores and a reduction in HAQ indices. However, adherence to treatment emerged as a critical determinant of therapeutic success—patients with high adherence experienced better disease control, lower DAS28 scores, and superior functional outcomes. Despite these positive trends, nearly 40% of patients exhibited low or insufficient adherence, which correlated with higher disease activity, increased pain perception, and poorer quality of life. This underscores the necessity of targeted interventions to improve adherence, particularly among older patients and those with comorbidities. Strategies such as personalized patient counseling, digital health technologies, and multidisciplinary support should be considered to enhance long-term treatment engagement and optimize outcomes.

Future research should focus on evaluating the effectiveness of adherence-enhancing strategies and their impact on the long-term prognosis of RA patients. Addressing barriers to treatment compliance may ultimately lead to better disease management and improved overall well-being for individuals living with RA.

Authors' contributions: *all authors contributed equally to the writing of the article.*

Conflict of interest*: no conflict of interest declared.*

Publication details: *the article has not been previously published in other journals and is not under consideration by other publishers.*

Funding*: none.*

Literature:

1. *Амирджанова В.Н., Койлубаева Г.М., Горячев Д.В., Фоломеева О.М., Эрдес Ш.Ф.* Валидация русскоязычной версии Health Assessment Questionnaire (HAQ). Научно-практическая ревматология. 2004. №2. С. 69-76

2. Клинические протоколы МЗ РК - 2016 (Казахстан). Ревматоидный артрит. Available from: https://diseases.medelement.com/

3. *Котовская М.А., Никишина Н.Ю., Олюнин Ю.А.* Персонализированная медицина: предикторы эффективности терапии биологическими агентами при ревматоидном артрите. Modern Rheumatology Journal. 2017. 11(2). С. 4-17

4. *Насонов Е.Л., Каратеев Д.Е., Балабанова Р.М.* Ревматоидный артрит. В кн.: Ревматология. Национальное руководство. Под ред. Е.Л. Насонова, В.А. Насоновой. Москва: ГЭОТАР-Медиа; 2008, 290-331.

5. *Полищук Е.Ю., Каратеев А. Е., Потапова А. С., Филатова Е., Хлабощина В.Н., Амирджанова В.Н., Лила А.М.* Нужно ли оценивать эффект терапии? Спросите пациента! Научно-Практическая Ревматология; 2023; 61(3): 361–368.

6. *Эрдес Ш., Эрдес К.Ш*. Вопросник SF-36 и использование его при ревматоидном артрите. Научно-практическая ревматология: 2003. №2. С. 47-52

7. *Brahem M., Sarraj R., Jebali B. et al.* Factors affecting quality of life in patients with rheumatoid arthritis // Annals of the Rheumatic Diseases. 2023. T. 82, Suppl 1, 1321–1321

8. *Feki A., Sellami I., Mnif I., Gassara Z. et al.* Quality of Life Assessment in Female Rheumatoid Arthritis Patients. European Psychiatry. 2024. T. 67, Suppl 1, S809–S810.

9. *Feng J., Yu L., Fang Y., Zhang X., Li S., Dou L.* Correlation between disease activity and patient-reported health-related quality of life in rheumatoid arthritis: a cross-sectional study. BMJ Open. 2024. T. 14. pp.1-8

10. *Fransen J., van Riel P.L.*The Disease Activity Score and the EULAR responsecriteria. Rheumatic Disease Clinics of North America. 2009. T. 35, №4, p.745-755.

11. *Haridoss M., Bagepally B.S., Natarajan M*. Health-related quality of life in rheumatoid arthritis:

Systematic review and meta-analysis ofEuroQoL (EQ-5D) utility scores from Asia. International Journal of Rheumatic Diseases. 2021. T. 24, №3, pp.314–326.

12. *Knight E., Carluzzo K. L., Reeve B.B. et al.* Health-related quality of life profiles of adults with arthritis and/or fibromyalgia: a cross-sectional study. Quality of Life Research. 2024. 34(2). p.523-534

13. *Lau C., Chia F., Harrison A. et al.* APLAR rheumatoid arthritis treatment recommendations. International Journal of Rheumatic Diseases. 2015. T. 18 p.685–713.

14. *Lillegraven S., Kvien T.K.* Measuring disability and quality of life in established rheumatoid arthritis. Best Practice & Research Clinical Rheumatology. 2007. T. 21, №5, p.827–840

15. *Maska L., Anderson J., Michaud K.* Measures of functional status and quality of life in rheumatoid arthritis: Health Assessment Questionnaire Disability Index (HAQ), Modified Health Assessment Questionnaire (MHAQ), Multidimensional Health Assessment Questionnaire (MDHAQ), Health Assessment Questionnaire II (HAQ-II), Improved Health Assessment Questionnaire (Improved HAQ), and Rheumatoid Arthritis Quality of Life (RAQoL). Arthritis Care Res (Hoboken). 2011. T. 63, Suppl 11. p.4-13.

16. *Matcham F., Scott I.C., Rayner L. et al.* The impact of rheumatoid arthritis on quality-of-life assessed using the SF-36: a systematic review and meta-analysis. Semin Arthritis Rheum. *2014*. T. 44, №2. p. 123-130.

17. *McGonagle D., Watad A., Savic S.* Mechanistic immunological based classification of rheumatoid arthritis. Autoimmunity Reviews. 2018. T. 17, №11. p. 1115–1123.

18. *Rodríguez-Montero S., Velloso-Feijoó M.L., Almeida C.* Biological therapy optimization in patients with moderate to severe rheumatoid arthritis: Analysis of effectiveness in a cohort of patients in clinical practice conditions. Annals of the Rheumatic Diseases. 2024. pp.1558 – 1559.

19. *Sakai R., Tanaka E., Inoue E., Sato M., Tanaka M., Ikari K., Yamanaka H., Harigai M.* Subjective Symptoms Contributing to the Quality of Life of Rheumatoid Arthritis Patients with Clinical Remission from the IORRA Database. Modern Rheumatology. 2022. №33 (3). p.496-502

20. Santiago-Garcia A.P., Gamez-Nava J.I., Avalos-Salgado F.A. et al. Research Group for Factors Related to Therapeutic Outcomes in Autoimmune Diseases. Complementary Therapies and Their Association with Problems in Therapeutic Adherence to Conventional Synthetic DMARDs in Rheumatoid Arthritis: A Cross-Sectional Study. Healthcare (Basel). 2023. T.12, №1. p. 49.

21. *Smolen J.S., Aletaha D., McInnes I.B.* Rheumatoid arthritis. Lancet. 2016. T. 388, №10055. p. 2023-2038.

22. *Song Y., Chen Y., Wen L. et al.* Health-related quality of life profiles in patients with rheumatoid arthritis: a latent profile analysis. Frontiers in Public Health. 2024. T. 12. p.2296-2565.

23. *Tanski W., Dudek K., &Adamowski T.* Work Ability and Quality of Life in Patients with Rheumatoid Arthritis. International Journal of Environmental Research and Public Health, 2022. 19(20) p.13260

24. *Van den Hoek J., Boshuizen H.C., Roorda L.D., et al.* Mortality in patients with rheumatoid arthritis: a 15-year prospective cohort study. Rheumatology International.2017. T. 37, №4, p.487–493.

25. *Wei M., Chu C.Q.* Prediction of treatment response: Personalized medicine in the management of rheumatoid arthritis. Best Practice & Research Clinical Rheumatology. 2022. T. 36, №1.

26. *Wolfe F., Michaud K., Pincus T.* Development and validation of the health assessment questionnaire II: a revised version of the health assessment questionnaire. Arthritis Rheum. 2004. T. 50, №10. p.3296-305

27. *Felson D.T., Smolen J.S.et al.* American College of Rheumatology/European League Against Rheumatism provisional definition of remission in rheumatoid arthritis for clinical trials. Arthritis Care and Research, 2011. 63(3), p.573-586.

28. *Gadallah M., Boulos D., Gebrel A., Dewedar S., Morisky D.* Assessment of Rheumatoid Arthritis Patients' Adherence to Treatment. The American journal of the medical sciences. 2014. 349(2) p.151-156.

29. *Yajima N., Kawaguchi T., Takahashi R. et al.* Adherence to methotrexate and associated factors considering social desirability in patients with rheumatoid arthritis: a multicenter cross-sectional study. BMC Rheumatol. 2022. 6, p.75

30. *Jarab A.S., Al-Qerem W., Abu Heshmeh S.R., Alzoubi K.H., Mukattash T.L., Akour A.* Disease control and its associated factors in outpatients with rheumatoid arthritis. Electron J Gen Med. 2023. 20(6). p.532-538

31. *Siddique M.I. et al.* Impact of Polypharmacy on Elderly Patients: A Comparative Study of Outcomes and Risk Management. Asian Journal of Pharmaceutics (AJP). 2024, 18(04). p.1054-1064.

***References[1-6]*:**

1. Amirdzhanova V.N., Koilubaeva G.M., Goriachev D.V., Folomeeva O.M., Erdes Sh.F. Validatsiya russkoyazychnoi versii Health Assessment Questionnaire (HAQ) [Validation of the Russian version of Health Assessment Questionnaire (HAQ)]. *Nauchno-prakticheskaya revmatologiya* [Scientific and Practical Rheumatology]. 2004. №2. p.69-76. [in Russian]

2. *Klinicheskie protokoly MZ RK* [Clinical Protocols of the MH RK] - 2016 (Kazakhstan). Revmatoidnyi artrit [Rheumatoid arthritis.]. Available from: https://diseases.medelement.com/ [in Russian]

3. Kotovskaia M.A., Nikishina N. Iu., OliuninIu.A. Personalizirovannaya meditsina: prediktory effektivnosti terapii biologicheskimi agentami pri revmatoidnom artrite [Personalized medicine: predictors of efficacy of biologic agent therapy in rheumatoid arthritis]. *Modern Rheumatology Journal.* 2017. 11, p. 4-17 [in Russian]

4. Nasonov E.L., Karateev D.E., Balabanova R.M. *Revmatoidnyi artrit. V kn.: Revmatologiya. Natsionalnoe rukovodstvo* [Rheumatoid arthritis.] In: Rheumatology. National guide]. Pod red. E.L. Nasonova, V.A. Nasonovoi. Moskva: GEOTAR-Media; 2008, pp.290-331. [in Russian]

5. Polishchuk E. Iu., Karateev A.E., Potapova A.S., Filatova E., Khlaboshchina V.N., Amirdzhanova V.N., Lila A.M. Nuzhno li otsenivat effect terapii? Sprosite patsienta! [Should the effect of therapy be evaluated? Ask the patient!]. *Nauchno-Prakticheskaya Revmatologiya*

[Scientific and Practical Rheumatology]. 2023. 61(3). p. 361–368. [in Russian]

6. *Erdes Sh., ErdesK. Sh.* Voprosnik SF-36 iispolzovanie ego pri revmatoidnom artrite [The SF-36 questionnaire and its use in rheumatoid arthritis]. *Nauchno-prakticheskaya revmatologiya.* [Scientific and Practical Rheumatology]. 2003. №2. p.47-52 [in Russian]

Information about authors:

Petrova Yuliya Viktorovna – Master of Medicine, Department of Internal Medicine and Rheumatology NCJSC «Semey Medical University», 103 Abay Street, Semey, 071400, Kazakhstan; Email: yuliya.petrova@smu.edu.kz; phone number: +7(771) 537 6060; https://orcid.org/0000-0003-1910-7169

Ivanova Raifa Latyfovna– Professor, Doctor of Medical Sciences, Department of Internal Medicine and Rheumatology NCJSC «Semey Medical University», 103 Abay Street, Semey, 071400, Kazakhstan; Email: raifa.ivanova@smu.edu.kz; phone number: +7(777)147 2892; https://orcid.org/0000-0001-9851-2255

Goremykina Maya Valentinovna - Candidate of Medical Sciences, Associate Professor, Department of Internal Medicine and Rheumatology, NCJSC «Semey Medical University», 103 Abay Street, Semey, 071400, Kazakhstan; Email: maya.goremykina@smu.edu.kz; phone number: +7 (777) 390 8234; https://orcid.org/0000-0002-5433-7771

Serikova Talshyn Kairgalievna - Resident of 2 years of training in the specialty “Rheumatology adult and pediatric”, NCJSC «Semey Medical University», 103 Abay Street, Semey, 071400, Kazakhstan; Email: talshyn.sk@gmail.com; phone number: +7(747) 184 4363; https://orcid.org/0009-0009-6840-1066

Karakanova Aigerim Baurzhankyzy - Resident of 2 years of training in the specialty “Rheumatology adult and pediatric”, NCJSC «Semey Medical University», 103 Abay Street, Semey, 071400, Kazakhstan; Email: moldabaevaa098@gmail.com; phone number: +7(707) 655 2814 https://orcid.org/0009-0008-2218-9082

Bakytova Anel Baqtiyarkyzy - Resident of 2 years of training in the specialty “Rheumatology adult and pediatric”, NCJSC «Semey Medical University», 103 Abay Street, Semey, 071400, Kazakhstan; phone number: +7(777) 375 3675; https://orcid.org/0009-0007-8804-4313

Seitkhan Danura Seytkhankyzy - Resident of 2 years of training in the specialty “Rheumatology adult and pediatric”, NCJSC «Semey Medical University», 103 Abay Street, Semey, 071400, Kazakhstan; Email: danuraseithan9@gmail.com; phone number: +7(707) 372 0895; https://orcid.org/0009-0001-7447-8889

Nogayeva Maral Gazizovna – Candidate of Medical Sciences, Professor of the Department of Rheumatology, Kazakh National Medical University named after S.D. Asfendiyarov, e-mail: maral.nogaeva@xmail.ru, Almaty, +7 708 800 52 65; https://orcid.org/0000-0003-1182-5967

Corresponding author:

Goremykina Maya Valentinovna - Candidate of Medical Sciences, Associate Professor, Department of Internal Medicine and Rheumatology, NCJSC «Semey Medical University»

Address: 103 Abay Street, Semey, 071400, Kazakhstan
E-mail: maya.goremykina@smu.edu.kz
Phone: +7 (777) 390 8234