



# Implementation of Mobile Applications in the Process of Screening Compliance of Patients in the Treatment of Chronic Non-Communicable Diseases

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**Abstract:** This article describes the results of a study on the adaptation, implementation and evaluation of the effectiveness of the MyTherapy mobile application in the practice of treating chronic non-infectious diseases in order to monitor treatment and patient compliance. Based on the more pronounced positive dynamics of the therapy itself, the improvement in the quality of life indicator and the indicator of adherence to treatment, it is shown that the use of this mobile application can be a highly effective method of monitoring the therapy of chronic non-infectious diseases when used correctly.

**Keywords:** anemia; compliance; therapy control; mobile applications.

**Introduction.** According to UNICEF multicenter studies conducted in Uzbekistan in 2017, approximately every seventh child in the country (15.6%) suffers from anemia. At the same time, 1% of patients have a severe form of anemia among chronic non-infectious diseases. About 20.3% of women of reproductive age and 32.7% of pregnant women also had severe symptoms of anemia[1,2]. The study of patients' attitudes towards prescribed therapy and the degree of its compliance is a fairly new area of scientific research. The development of this direction is due to the large role of the paradigm of interaction between the doctor and the patient, the transition from the paternalistic model to partnerships and the patient's awareness of his own active role in therapy [3,4,5,6].

Inadequate adherence to medications is a likely cause of treatment failure in chronic noncommunicable diseases. Patient adherence, or compliance, to treatment is usually defined as the degree to which patients comply with doctors' instructions [7,8,9]. Insufficient compliance is a common phenomenon and a problem for healthcare systems in many countries. According to WHO, in developed countries only 50% of patients suffering from chronic diseases strictly follow medical recommendations for a long time; in developing countries the figure is even lower [10,11,12].

The beginning of the third decade of the 21st century was characterized by the rapid development and proliferation of electronic "gadgets" in all aspects of society. In this regard, one of the most relevant areas of medicine today is to improve the process of diagnosis, treatment and prevention of various diseases through the introduction of special mobile applications. The huge advantage of such software is that "gadgets" (smartphones, tablets, laptops, smart watches) are in the hands of the average person, according to sociological studies, for 12-16 hours a day, which determines their high potential in terms of impact on the patient.

**Purpose of the study.** Adaptation and implementation of modern mobile software applications designed to monitor medication intake in the treatment process of patients with chronic non-communicable diseases, and assessment of their effectiveness in terms of increasing patient compliance.

**Material and research methods.** The study included 60 patients with moderate iron deficiency anemia (hemoglobin level 90-70 g/l). The average age of the patients was  $24.23 \pm 3.42$  years. Gender distribution: 48 women (80%) and 12 men (20%).

All patients received outpatient treatment of the pancreas. The study included only patients taking pancreatic Fe (III) (iron hydroxide polymaltosate) in order to exclude the influence of side effects from taking drugs (in the case of pancreatic Fe (II)), which may affect patient compliance. During treatment, patients included in the sample under consideration took various trade names of Fe(III) pancreatic acid, among which the most frequently used were Maltofer and Ferrum Lek. In addition to taking pancreatic acid, ascorbic acid preparations or multivitamin complexes were prescribed.

To assess the effectiveness of using a mobile application for compliance monitoring, patients were divided into 2 groups homogeneous by age and gender ratio:

- the main group included 30 patients whose therapy compliance was monitored using the MyTherapy mobile application;
- the control group included 30 patients whose anemia was treated without compliance control.

There are more than 10 applications available on the Internet for monitoring medication intake, the interface and functionality of which can be used to improve patient compliance in the treatment of chronic non-communicable diseases. We chose the MyTherapy application. This application is distributed on the Internet and is available for free download on devices running on both Android and IOS. The application has a fairly wide range of functions.

First of all, you can enter information into the application about taking the drug, its form, frequency of administration, time of administration and duration of treatment. After entering the appropriate information about the time of taking the drug, a special signal will be triggered in the form of music or other sound, which will announce the time of taking the drug. When a signal appears, the application requires confirmation of taking the drug, which is important for recording compliance or non-compliance with the doctor's prescription. Daily drug intake is recorded and stored in the form of a report (in pdf format), which can subsequently be printed or emailed to the attending physician.

In addition to reminders about taking medications, you can enter notifications into the application about visiting a doctor, taking a test, and taking any preventive measures (gymnastics, walking, etc.), the registration and implementation of which will also be recorded in a special report.

You can enter the results of various measurements and analyzes in a separate section. A separate section is devoted to checking the symptoms of the disease, which is important in monitoring the dynamics of therapy and its effectiveness.

During the study, this application was installed on the smartphones or tablets of all patients with anemia who were included in the study. After installing the mobile application, the doctor entered the names of the drugs, their dose, dosage form, time of administration and duration of therapy (3 months for all patients). The dates of repeated visits to the doctor (once a month), the dates of donating blood to determine hemoglobin levels (once a month), and the dates of donating blood to determine ferritin levels (before the start and after the end of the course of ferrotherapy) were separately noted.

To provide reminders, the applications included precisely those activities that most patients often neglect to complete. Nevertheless, these measures are of great importance in monitoring the course of pancreatic therapy and comply with generally accepted standards.

During therapy, all patients included in the main group notified the doctor weekly about the progress of therapy by sending a report on taking the pancreas and completing other instructions via the Telegram messenger. To assess the effectiveness of ferrotherapy, patients were administered a

questionnaire to assess adherence to therapy using the Morisky-Green questionnaire. To assess the quality of life (QoL) in patients with anemia, the FACT-An (For patients with anemia/fatigue) questionnaire was used. Also, during the 3-month follow-up, patients' visits to the doctor and relevant tests were recorded.

Statistical processing of the obtained data was carried out using the Microsoft Excel statistical software package. Data are presented as means and error of the mean.

**Results.** Analysis of the average number of missed pancreatic doses showed that during the first month of therapy, patients in the main group missed pancreatic doses  $6.8 \pm 2.1$  times, while in the 3rd month the indicator improved significantly and amounted to  $2.4 \pm 1.8$  missed meals per day. average Analysis of the average number of late PZ appointments during the first month was  $14.2 \pm 4.3$  times, and in the third month it was  $6.3 \pm 3.2$  times. Analysis of the average number of missed doses of vitamin preparations showed that during the first month of therapy, patients in the main group missed taking PZ  $12.5 \pm 3.5$  times, while by the 3rd month the indicator improved significantly and amounted to  $4.4 \pm 2.6$  omissions average. Analysis of the average number of untimely intakes of vitamin preparations during the first month was  $17.7 \pm 4.4$  times, and in the third month it was  $8.3 \pm 3.7$  times (Table 1).

**Table 1. Average number of missed medications in patients in the main group according to monthly MyTherapy reports.**

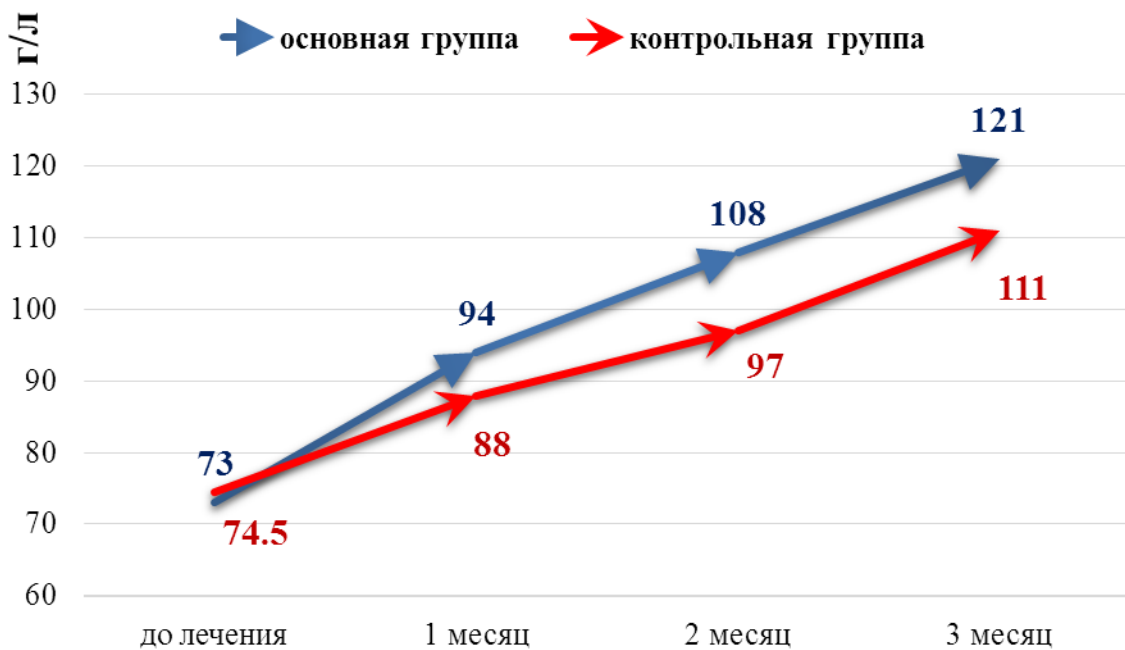
Medications taken	Average number of missed doses		Average number of late taking the drug	
	1 month	3 month	1 month	3 month
Iron supplements	$6.8 \pm 2.1$	$2.4 \pm 1.8$	$14.2 \pm 4.3$	$6.3 \pm 3.2$
Vitamins	$12.5 \pm 3.5$	$4.4 \pm 2.6$	$17.7 \pm 4.4$	$8.3 \pm 3.7$

Analysis of the results of assessing adherence using the Morisky-Green scale after 3 months of therapy showed that the proportion of non-adherent patients in the main group was 10%, while in the control group it was 4 times higher (Fig. 1).

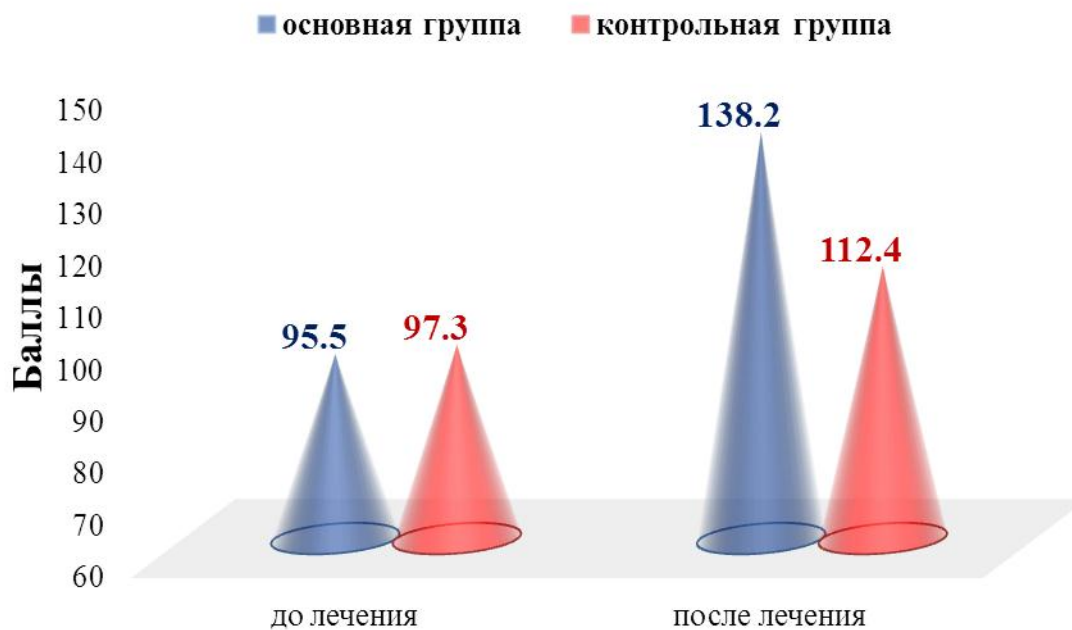
The number of adherents to therapy was 73% in the main group, while in the control group it was only 10%. Observations of the dynamics of hemoglobin growth in the study groups showed that in the main group there was a higher level of its monthly increase in the blood (Fig. 2). By the end of 3 months, in the main group the hemoglobin level averaged 121 g/l, while in the control group it was 111 g/l.



**Figure 1. Results of adherence assessment using the Morisky-Green scale in patients after 3 months of therapy.**



**Figure 2. Results of determining the hemoglobin level of patients over time.**



**Figure 3. Results of assessing the quality of life of patients over time.**

Along with an increase in hemoglobin levels in patients in the study groups, there was also an improvement in the quality of life indicator, the values of which according to the FACT-An test were 95.5 and 97.3 points in the main and control groups, respectively. After treatment, the average score of patients in the main group increased to 138.2 points, while in the control group it increased to 112.4 points (Fig. 3).

In this regard, anemia has a significant impact on the quality of life of patients. Assessing the quality of life of patients using the FACT-An questionnaire showed that significantly higher rates were observed in patients undergoing treatment for chronic non-infectious diseases under the control of the MyTherapy mobile application. It should also be noted that patients in the main group visited the attending physician significantly more often during therapy, which was prescribed in the treatment. The main group of patients also had a higher average number of planned and prescribed doctor visits (3.4 visits), as well as a higher average number of hemoglobin blood tests ordered by a doctor (3.1 tests).

**Conclusion.** Observations of patients receiving treatment for 3 months showed that patients in the main group had significantly higher compliance rates according to the Morisky-Green scale, a more pronounced increase in hemoglobin levels in the blood and higher quality of life indicators compared to patients in the control group. Based on the demonstrated effectiveness, accessibility and simplicity, the proposed method can be recommended for implementation in widespread medical practice.

## LITERATURE

1. Ходжиева Г. С., Наврузов Р. Р. Синдром Жильбера и особенности течения функциональных заболеваний билиарного тракта //Вестник Совета молодых учёных и специалистов Челябинской области. – 2017. – Т. 1. – №. 1 (16). – С. 44-46.
2. Ходжиева Г. С., Жарылкасынова Г. Ж. Фармакоэкономика и комплаенс пациентов как важнейшие составляющие успешной терапии железодефицитной анемии //ЎЗБЕКИСТОН РЕСПУБЛИКАСИ СОҒЛИҚНИ САҚЛАШ ВАЗИРЛИГИ ТОШКЕНТ ТИББИЁТ АКАДЕМИЯСИ. – 2020. – С. 48.
3. Ходжиева Г. С. Интраональность и специфика течения функциональных заболеваний билиарного тракта при синдроме Жильбера //Научный форум: Медицина, биология и химия. – 2018. – С. 64-68.
4. Ходжиева Г. С. Интраональность и специфика течения функциональных заболеваний билиарного тракта при синдроме Жильбера //Научный форум: Медицина, биология и химия. – 2018. – С. 64-68.
5. Орзиев З. М., Ходжиева Г. С. Диапазон факторов экстрагепатических "субтрансаминаземий" //Биология и интегративная медицина. – 2018. – №. 4. – С. 50-61.
6. Ходжиева Г. С. ЗНАЧЕНИЕ ОБРАЗОВАТЕЛЬНО-ПЕДАГОГИЧЕСКИХ ТЕХНОЛОГИЙ В ФОРМИРОВАНИИ КЛИНИЧЕСКИХ ЗНАНИЙ УЧАЩИХСЯ //BARQARORLIK VA YETAKSHI TADQIQOTLAR ONLAYN ILMIY JURNALI. – 2022. – Т. 2. – №. 12. – С. 793-798.
7. Ходжиева Г. С. ЗНАЧЕНИЕ ОБРАЗОВАТЕЛЬНО-ПЕДАГОГИЧЕСКИХ ТЕХНОЛОГИЙ В ФОРМИРОВАНИИ КЛИНИЧЕСКИХ ЗНАНИЙ УЧАЩИХСЯ //«СОВРЕМЕННОЕ СОСТОЯНИЕ, ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ МЕДИЦИНСКОГО ОБРАЗОВАНИЯ» МЕЖДУНАРОДНАЯ УЧЕБНО-НАУЧНО-ПРАКТИЧЕСКАЯ КОНФЕРЕНЦИЯ «ТИББИЙ ТАЪЛИМНИНГ ЗАМОНАВИЙ ГОЛАТИ. – С. 127.
8. Ходжиева Г. С., Наврузов Р. Р. Синдром Жильбера и особенности течения функциональных заболеваний билиарного тракта //Вестник Совета молодых учёных и специалистов Челябинской области. – 2017. – Т. 1. – №. 1 (16). – С. 44-46.
9. Ходжиева Г. С. ЗНАЧЕНИЕ ОБРАЗОВАТЕЛЬНО-ПЕДАГОГИЧЕСКИХ ТЕХНОЛОГИЙ В ФОРМИРОВАНИИ КЛИНИЧЕСКИХ ЗНАНИЙ УЧАЩИХСЯ //BARQARORLIK VA YETAKSHI TADQIQOTLAR ONLAYN ILMIY JURNALI. – 2022. – Т. 2. – №. 12. – С. 793-798.
10. Ходжиева Г. С., Жарылкасынова Г. Ж. Фармакоэкономика и комплаенс пациентов как важнейшие составляющие успешной терапии железодефицитной анемии //ЎЗБЕКИСТОН РЕСПУБЛИКАСИ СОҒЛИҚНИ САҚЛАШ ВАЗИРЛИГИ ТОШКЕНТ ТИББИЁТ АКАДЕМИЯСИ. – 2020. – С. 48.
11. Ходжиева Г. С. Частота распространения и особенности течения функциональных заболеваний билиарного тракта при синдроме Жильбера //Новая наука: Стратегии и векторы развития. – 2017. – Т. 2. – №. 3. – С. 12-15.
12. Ходжиева Г. С., Киличева В. А. Оценка информативной возможности показателей pH желчи в прогнозе эффективности конечных результатов орального литолиза //Евразийский Союз Ученых. – 2018. – №. 4-2 (49). – С. 61-64.

13. Ходжиева Г., Орзиев З. Особенности течения функциональных заболеваний билиарного тракта при синдроме Жильбера //Журнал проблемы биологии и медицины. – 2017. – №. 4 (97). – С. 135-136.
14. Орзиев З. М., Ходжиева Г. С. Региональные причины экстрагепатических "субтрансаминаземий" //Дневник казанской медицинской школы. – 2015. – №. 1. – С. 33-36.
15. Rakhmatova D. B., Rakhmatova D. B. " Main" Symptoms and leading clinical options for the flow of acute coronary syndromes in women //Asian Journal of Multidimensional Research (AJMR). – 2019. – Т. 8. – №. 11. – С. 69-74.
16. Rakhmatova D. B. Analysis of the risk factors of Chd in persons over 60 years among the population of the city of Bukhara //Asian studies. Индия. – 2019. – Т. 1. – С. 33-38.
17. Rakhmatova D. B., Zikrillaev F. A. DETERMINE THE VALUE OF RISK FACTORS FOR MYOCARDIAL INFARCTION //FAN, TA'LIM, MADANIYAT VA INNOVATSIYA. – 2022. – Т. 1. – №. 4. – С. 23-28.
18. Рахматова Д. Б., Аслонова М. Р. Современные методы медицинской реабилитации пациентов с артериальной гипертензией //Биология и интегративная медицина. – 2018. – №. 3. – С. 110-117.
19. Рахматова Д. Б. и др. ОЦЕНКА ФАКТОРОВ РИСКА ИБС У ЛИЦ СТАРШЕ 60 ЛЕТ СРЕДИ НАСЕЛЕНИЯ ГОРОДА БУХАРЫ //Теория и практика современной науки. – 2018. – №. 5 (35). – С. 704-708.
20. Urinbaevna Y. R. Features of Prediction of the Severity of Iron Deficiency in Helicobacter Pylori Infection //Scholastic: Journal of Natural and Medical Education. – 2023. – Т. 2. – №. 4. – С. 93-99.
21. Юлдашова Р. У. ЭПИДЕМИОЛОГИЧЕСКАЯ ХАРАКТЕРИСТИКА ЖЕЛЕЗОДЕФИЦИТНОЙ АНЕМИИ У ДЕТЕЙ И ПОДРОСТКОВ В РЕСПУБЛИКЕ УЗБЕКИСТАН ЗА 2007-2019 ГОДЫ //Новый день в медицине. – 2020. – №. 4. – С. 742-747.
22. Юлдашова Р. У., Жарылкасынова Г. Ж., Сафоев Б. Б. МОДЕРНИЗАЦИЯ КУРСА ДОВРАЧЕБНОЙ НЕОТЛОЖНОЙ ПОМОЩИ В БУХАРСКОМ ГОСУДАРСТВЕННОМ МЕДИЦИНСКОМ ИНСТИТУТЕ КАК ОДИН ИЗ УСОВЕРШЕНСТВОВАННЫХ МЕТОДОВ ОБУЧЕНИЯ (в рамках проекта ModeNEd) //Оптимизация высшего медицинского и фармацевтического О-62 образования: менеджмент качества и инновации: материалы IX внутривузовской научно-практической конференции.—Челя-бинск: Издательство Южно-Уральского государственного меди-цинского университета, 2018.— 153,[1] с. – 2018. – С. 150.
23. Юлдашова Р. У. и др. ИСПОЛЬЗОВАНИЕ СИСТЕМЫ ДИСТАНЦИОННОГО ОБУЧЕНИЯ MOODLE ПРИ ПОВЫШЕНИИ КВАЛИФИКАЦИИ ВРАЧЕЙ //Оптимизация высшего медицинского и фармацевтического об-О-62 разования: менеджмент качества и инновации: материалы VIII внутривузовской научно-практической конференции.—Челя-бинск: Издательство Южно-Уральского государственного меди-цинского университета, 2017.—136 с. – 2017. – С. 135.
24. Sultonova N. A. THE PROBLEM OF ADDICTED MISSING OF PREGNANCYIN EARLY STAGES OF PREGNANCY //Oriental Journal of Academic and Multidisciplinary Research. – 2023. – Т. 1. – №. 1. – С. 94-101.
25. Sultonova N. A. Dopplerometric Features of Blood Flow Changes in the Utero-Placental System in Women With Related Pregnancy Mission //Miasto Przyszłości. – 2023. – Т. 34. – С. 268-273.
26. Sultonova N. A. Evaluation of Clinical and Instrumental Results of Patients with a Risk of Development of Recurrent Mission //Central Asian Journal of Medical and Natural Science. – 2023. – Т. 4. – №. 2. – С. 536-542.

27. Юлдашова Р. У., Наврузова Л. Х. Отношение студентов и преподавателей к электронному обучению //Педагогический профессионализм в образовании. – 2015. – С. 219-220.
28. Urinbaevna Y. R. Features of Prediction of the Severity of Iron Deficiency in Helicobacter Pylori Infection //Scholastic: Journal of Natural and Medical Education. – 2023. – Т. 2. – №. 4. – С. 93-99.
29. Юлдашова Р. У., Жарылкасынова Г. Ж. Анализ Эффективности Препаратов Двухвалентного И Трехвалентного Железа Среди Больных Железодефицитной Анемии В Узбекистане //Central Asian Journal of Medical and Natural Science. – 2021. – С. 437-441.
30. Тиллоева Ш. Ш., Давлатов С. С. Эффективность и переносимость локсидола в лечение ревматоидного артрита у пациентов старших возрастных групп //Central Asian Journal of Medical and Natural Science. – 2021. – С. 432-436.
31. Тиллоева Ш. Ш. и др. Estimation of the condition of the cardiorespiratory system of patients with the concilation of bronchial asthma and arterial hypertension, effects of complex therapy //Новый день в медицине. – 2020. – №. 2. – С. 227-230.
32. Tillaeva S. S. et al. Currency and diagnostic criteria of rheumatoid arthritis in patients of senior age groups //Asian Journal of Multidimensional Research (AJMR). – 2018. – Т. 7. – №. 11. – С. 184-188.
33. Жалолова В. З. и др. Роль инновационных методов обучения на развитие уровня знаний студентов //Новый день в медицине. – 2019. – Т. 4. – №. 28. – С. 32-35.
34. ЖАЛОЛОВА В. З., РАХМАТОВА М. Р. Anthropometric indicators of juniors and cadets in sport medicine //Биология и интегративная медицина. – 2020. – №. 4. – С. 5-15.
35. Zamirovna J. V. Methods for Selecting Junior and Cadets Athletes by Morphofunctional Criteria //Central Asian Journal of Medical and Natural Science. – 2021. – С. 87-91.
36. DJuraev A. M., Khalimov R. J. New methods for surgical treatment of perthes disease in children //International Journal of Psychosocial Rehabilitation. – 2020. – Т. 24. – №. 2. – С. 301-307.
37. DJuraev A. M., Khalimov R. J. New methods for surgical treatment of perthes disease in children //International Journal of Psychosocial Rehabilitation. – 2020. – Т. 24. – №. 2. – С. 301-307.
38. DJuraev A. M., Khalimov R. J. New methods for surgical treatment of perthes disease in children //International Journal of Psychosocial Rehabilitation. – 2020. – Т. 24. – №. 2. – С. 301-307.
39. Джураев А. и др. Наш опыт хирургического лечения врожденного возвышения лопатки у детей раннего возраста //Медицина и инновации. – 2021. – Т. 1. – №. 4. – С. 37-44.
40. Ipkhomovna K. D. Morphological Features of Tumor in Different Treatment Options for Patients with Locally Advanced Breast Cancer //International Journal of Innovative Analyses and Emerging Technology. – 2021. – Т. 1. – №. 2. – С. 4-5.
41. Khodzhaeva D. I. Changes in the Vertebral Column and Thoracic Spinecells after Postponement of Mastoectomy //International Journal of Innovative Analyses and Emerging Technology. – 2021. – Т. 1. – №. 4. – С. 109-113.
42. Khodjayeva D. I. MORPHOLOGY OF IDIOPATHIC SCOLIOSIS BASED ON SEGMENT BY SEGMENT ASSESSMENT OF SPINAL COLUMN DEFORMITY //Scientific progress. – 2022. – Т. 3. – №. 1. – С. 208-215.
43. Ipkhomovna K. D. Modern Look of Facial Skin Cancer //BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMYIY JURNALI. – 2021. – Т. 1. – №. 1. – С. 85-89.
44. Mamedov U. S., Pulatova D. SH. The Results of Cancer Treatment of the Oral Caviti Tumors in //the Republic of Uzbekistan European journal of Pharmaceutical and Medical Research.-2019.-6 (9).-P. – С. 326-329.

45. Mamedov U. S., Khodjaeva D. I. Modern diagnostic approach treatment of thyroid cancer //International Journal of Development and Public Policy. – 2021. – Т. 1. – №. 4. – С. 101-105.
46. Мамедов У. С., Нуров Ж. Р. Результаты комбинированных и комплексных методов лечения рака глотки //Вестник науки и образования. – 2020. – №. 24-3 (102). – С. 68-74.
47. Мамедов У. С. К вопросу о лечении регионарных метастазов опухолей орофарингиальной зоны //Бюллетень ассоциации врачей Узбекистана. – 2011. – №. 3. – С. 61-63.
48. Sunnatovich M. U., Kizi A. M. A. Radiation Diagnostics of Liver Echinococcosis //Central Asian Journal of Medical and Natural Science. – 2021. – Т. 2. – №. 5. – С. 424-433.
49. MAMEDOV U. S. Improvement of Extended Lymphadenectomy in the Treatment of Tumors of the Oropharyngeal Region // " ONLINE-CONFERENCES" PLATFORM. – 2021. – С. 125-125.
50. Мамедов У. С., Нарзиева Д. Ф. Отдаленные результаты лечения рака слизистой полости рта //Вестник науки и образования. – 2020. – №. 24-3 (102). – С. 75-81.
51. Idiyevna S. G. Discussion of results of personal studies in the use of mil therapy in the treatment of trauma to the oral mucosa //European Journal of Molecular medicine Volume. – Т. 2.
52. Idiyevna S. G. THE EFFECTIVENESS OF THE USE OF MAGNETIC-INFRARED-LASER THERAPY IN TRAUMATIC INJURIES OF ORAL TISSUES IN PRESCHOOL CHILDREN //Academic leadership. ISSN. – Т. 15337812.
53. Sharipova G. I. Light and laser radiation in medicine //European journal of modern medicine and practice. – 2022. – Т. 2. – №. 1. – С. 36-41.
54. Idievna S. G. THE EFFECT OF DENTAL TREATMENT-PROFILACTICS ON THE CONDITION OF ORAL CAVITY ORGANS IN CHILDREN WITH TRAUMATIC STOMATITIS //Tibbiyotdayangikun» scientific-abstract, cultural and educational journal.- Bukhara. – 2022. – Т. 5. – №. 43. – С. 103-106.
55. Idievna S. G. CHANGES IN THE CONTENT OF TRACE ELEMENTS IN THE SALIVA OF PATIENTS IN THE TREATMENT OF PATIENTS WITH TRAUMATIC STOMATITIS WITH FLAVONOID-BASED DRUGS //Journal of research in health science. – Т. 6. – С. 23-26.
56. Ikmomovna I. F., Jumatovich J. U., Elmuradovich I. G. Influence of the harmful factors of manufacture of synthetic detergents and cleaners on the clinical-functional parameters of the oral cavities in the workers //European science review. – 2014. – №. 9-10. – С. 31-32.
57. Ибрагимова Ф. И., Жумаева А. А., Ражабова Д. Б. Влияние неблагоприятных факторов условий труда в производстве синтетических моющих и чистящих средств на состояние тканей пародонта у рабочих //Наука молодых–Eruditio Juvenium. – 2015. – №. 1. – С. 31-34.
58. Ikmomovna I. F. Prevalence and character of the oral cavity mucosa in the workers of the manufacture of the synthetic detergents //European science review. – 2016. – №. 3-4. – С. 178-179.
59. Ибрагимова Ф. И., Замонова Г. Ш. Влияние вредных факторов производства на клинико-функциональные показатели полости рта рабочих //Символ науки. – 2016. – №. 8-1. – С. 181-182.
60. Ibragimova F. I., Idiev G. E. The state of health of workers in the production of synthetic detergents and cleaning products." Problems of Biology and Medicine //International Scientific Journal.-Samarkand. – 2012. – №. 1. – С. 68.
61. Ибрагимова Ф. И., Жуматов У. Ж. Поражения слизистой оболочки полости рта у работающих в производстве синтетических моющих и чистящих средств //Молодежный инновационный вестник. – 2016. – Т. 5. – №. 1. – С. 165-166.



62. Ибрагимова Ф. И., Замонова Г. Ш. ОЦЕНКА НЕКОТОРЫХ ФУНКЦИОНАЛЬНЫХ ПОКАЗАТЕЛЕЙ ПОЛОСТИ РТА У РАБОЧИХ ПРОИЗВОДСТВА СЫРЬЕВЫХ КОМПОНЕНТОВ ДЛЯ СИНТЕТИЧЕСКИХ МОЮЩИХ СРЕДСТВ //Молодежный инновационный вестник. – 2016. – Т. 5. – №. 1. – С. 163-165.
63. Ибрагимова Ф. И., Замонова Г. Ш. Влияние вредных факторов производства на клиничко-функциональные показатели полости рта рабочих //Символ науки. – 2016. – №. 8-1. – С. 181-182.
64. Ибрагимова Ф. И., Идиев Г. Э. Действие гипохлорита натрия (ингредиента синтетических моющих средств) на активность окислительно-восстановительных ферментов, и её коррекция введением растительных препаратов в эксперименте //Проблемы биологии и медицины–Самарканд. – 2017. – Т. 4. – С. 98.