

Dietary Micronutrient Optimization and Nutritional Interventions for Prevention of Acute Viral Respiratory Infections

Ne'matjonov Behruzбек Nurmatjon o'g'li

Fergana Medical Institute of Public Health

ABSTRACT

Viral respiratory infections remain a major public health concern globally, affecting millions annually and causing significant morbidity and mortality. Growing evidence demonstrates that nutritional status critically influences immune competence and susceptibility to infection. This review synthesizes current research on dietary interventions and micronutrient supplementation for prevention of acute viral infections. Key nutrients including vitamins C, D, E, zinc, and selenium have demonstrated immunomodulatory properties and antiviral effects in clinical and pre-clinical studies. Mediterranean and DASH dietary patterns, rich in polyphenols and antioxidants, show promise in reducing infection severity through anti-inflammatory mechanisms. Probiotics and prebiotics enhance gut microbiota composition, strengthening the gut-lung axis and improving respiratory immune responses. Adequate protein, omega-3 fatty acids, and micronutrient status are essential for optimal antibody production and T-cell maturation. Malnutrition, including both undernutrition and obesity, significantly increases vulnerability to severe viral infection outcomes. This comprehensive analysis emphasizes the importance of balanced nutrition as a cost-effective, accessible preventive strategy for reducing viral infection incidence and severity across diverse populations.

Keywords: *viral infections, nutrition, micronutrients, immune response, diet prevention, public health*

1. INTRODUCTION

Viral respiratory infections, including influenza, common cold, and SARS-CoV-2, represent persistent global health challenges [1–3]. The pandemic era has underscored the critical importance of strengthening individual and population-level immune defenses. Nutrition serves as a fundamental pillar of immunocompetence, with emerging evidence demonstrating that dietary patterns and micronutrient status directly influence susceptibility to viral infections and infection severity [1, 2]. Inadequate nutrition impairs immune system functioning and increases vulnerability to pathogenic invasion, resulting in elevated infection incidence and worse clinical outcomes [3, 4].

Micronutrients such as vitamins A, C, D, E, and trace elements including zinc, selenium, and iron are essential for innate and adaptive immune responses [2, 5]. Deficiencies in these critical nutrients have been associated with increased infection

susceptibility and adverse clinical outcomes during viral infections [3, 6]. Beyond individual micronutrients, dietary patterns emphasizing whole foods, fiber, and bioactive compounds have demonstrated protective effects. The Mediterranean diet, characterized by high polyphenol content and anti-inflammatory properties, has shown potential in attenuating viral infection severity [7, 8]. Additionally, the composition and function of the gut microbiota play crucial regulatory roles in immune competence through the gut-lung axis mechanism, suggesting that probiotics and prebiotics may enhance respiratory immunity [4, 9].

This comprehensive review aims to synthesize current scientific evidence regarding dietary and nutritional interventions for preventing viral infections. We examine the mechanistic roles of specific micronutrients, dietary patterns, and microbiota-modulating approaches in enhancing immune responses and reducing infection risk, with particular focus on respiratory viral pathogens.

2. METHODS

A comprehensive literature review was conducted systematically searching PubMed, Google Scholar, and Web of Science databases utilizing keywords including 'nutrition,' 'viral infections,' 'micronutrients,' 'immune response,' 'diet,' and 'prevention.' Studies published between 2018–2025 were prioritized, with inclusion of seminal earlier studies. Peer-reviewed original research articles, meta-analyses, systematic reviews, and clinical trials were included. Exclusion criteria encompassed non-peer-reviewed literature, studies lacking quantitative data, and those not addressing immune or viral infection outcomes. Data extraction included study design, population characteristics, dietary/nutritional interventions, outcome measures, and findings.

Quality assessment utilized established criteria evaluating methodology, sample size, outcome measurement, and potential bias sources. Evidence synthesis synthesized findings across nutrient categories, dietary patterns, and mechanistic pathways.

Review Component	Methodology	Evaluation Criteria
Literature Search	PubMed, Google Scholar, Web of Science (2018–2025)	Relevance, peer-review status
Study Design	RCT, cohort, case-control, meta-analysis, systematic review	Quality assessment score
Outcome Measures	Infection incidence, severity, immune markers, hospital admission	Statistical significance
Data Synthesis	Thematic analysis by nutrient, dietary pattern, mechanistic pathway	Evidence consistency

3. RESULTS

3.1 Micronutrients and Immune Function

Vitamin C functions as a critical cofactor for immune cell differentiation and antibody synthesis. The literature demonstrates that vitamin C supplementation reduces cold duration and symptom severity in individuals exposed to extreme physical stress. High-dose intravenous vitamin C administration in severely ill patients has shown improved inflammatory markers and, in some studies, reduced mortality in acute respiratory distress syndrome.

Vitamin D regulates both innate and adaptive immune responses through its receptor present on immune cells. Studies demonstrate inverse relationships between serum 25-hydroxyvitamin D levels and respiratory tract infection incidence. Vitamin D deficiency has been documented in acute respiratory infection patients, suggesting repletion may improve outcomes. Proposed mechanisms include enhanced production of antimicrobial peptides and reduced pro-inflammatory cytokine production through suppression of nuclear factor-kappa B signaling.

Zinc plays essential roles in T-cell maturation, natural killer cell function, and antibody production. Zinc deficiency impairs immune cell differentiation and reduces interferon production. Meta-analyses of supplementation trials demonstrate that zinc administration within 24 hours of symptom onset reduces illness duration by approximately one day and decreases severity in adults. However, long-term supplementation effects remain less conclusive.

Selenium functions as a cofactor for selenoproteins essential for antioxidant defense and immune regulation. Selenium deficiency impairs T-cell maturation and antibody responses. Studies on selenium supplementation show enhanced interferon-alpha and interferon-gamma production and improved T-cell responses. Selenium adequacy appears particularly important during severe viral infections characterized by oxidative stress and dysregulated inflammation.

Vitamins A and E, along with iron and copper, contribute to barrier integrity and immune cell function. Deficiencies in these micronutrients significantly increase infection susceptibility, particularly in vulnerable populations.

3.2 Dietary Patterns and Polyphenols

Mediterranean diet adherence has demonstrated inverse associations with viral infection severity. The diet emphasizes vegetables, fruits, olive oil, whole grains, legumes, and fish—all rich in polyphenolic compounds. Polyphenols including quercetin, catechin, resveratrol, and naringenin exert antioxidant and anti-inflammatory effects through multiple mechanisms: reduction of reactive oxygen species generation, inhibition of nuclear factor-kappa B signaling, and modulation of pro-inflammatory cytokine production including interleukin-6 and tumor necrosis factor-alpha.

Mediterranean diet patterns strengthen epithelial barrier function and activate polymorphonuclear and natural killer cells to produce antimicrobial peptides. The DASH (Dietary Approaches to Stop Hypertension) diet, similarly rich in fruits, vegetables, whole grains, and low in processed foods, shows comparable anti-inflammatory benefits. Conversely, Western dietary patterns—high in saturated fat, refined carbohydrates, and sugar and low in fiber—promote systemic inflammation and reduced immune competence.

Omega-3 polyunsaturated fatty acids, abundant in oily fish and plant sources, mediate anti-inflammatory effects through specialized pro-resolving mediator production. Adequate fiber intake promotes short-chain fatty acid production through microbial fermentation, supporting mucosal immunity and reducing pathological inflammation.

3.3 Gut Microbiota, Probiotics, and Prebiotics

The gut-lung axis represents an emerging mechanistic understanding of how intestinal microbiota composition influences respiratory immune responses. Specific bacterial taxa including Bacteroidetes and Firmicutes produce short-chain fatty acids and other metabolites that systemically enhance Th1 immune responses and reduce excessive pro-inflammatory responses that characterize severe viral pneumonia.

Meta-analyses demonstrate that probiotics (live beneficial bacteria) and prebiotics (fermentable fiber substrates) administration significantly reduces viral respiratory infection incidence by approximately 20%. Mechanistically, probiotics enhance intestinal mucosal barrier function, reduce pathogenic colonization, and stimulate regulatory T-cell expansion and anti-inflammatory cytokine interleukin-10 production. Interferon-alpha, interferon-gamma, and interleukin-12 concentrations increase significantly with probiotic/prebiotic supplementation, while pro-inflammatory cytokines including tumor necrosis factor-alpha and interleukin-6 decrease.

Specific probiotic strains including *Lactobacillus rhamnosus* and *Bifidobacterium lactis* have demonstrated enhanced protective efficacy in clinical trials. Dysbiosis—microbiota disruption from broad-spectrum antibiotics or poor diet—significantly impairs respiratory immunity and increases secondary infection risk during severe viral illness.

3.4 Nutritional Status and Infection Severity

Both undernutrition and overnutrition (obesity) compromise immune responses and increase severe viral infection risk. Malnutrition impairs T-cell and B-cell function, reduces antibody production, and increases susceptibility to secondary bacterial infections. Historically, the Spanish influenza pandemic and more recently the 2009 H1N1 pandemic demonstrated that malnutrition significantly increased mortality risk.

Obesity—defined as body mass index greater than 30 kg/m²—independently predicts severe infection and hospitalization during influenza and COVID-19. Obesity-associated chronic systemic inflammation, impaired regulatory T-cell function, and reduced interferon responses contribute to enhanced viral replication and worse

outcomes. Adequate protein intake proves essential for maintaining sufficient immune cell populations and antibody synthesis.

4. DISCUSSION

This comprehensive synthesis of published evidence demonstrates compelling associations between dietary patterns, nutritional status, and resistance to viral infections. The mechanistic understanding of how nutrients influence immune responses has advanced substantially through *in vitro* studies, animal models, and human trials [1–5, 10–15]. The multifactorial nature of nutritional influences on immunity necessitates integrated approaches emphasizing overall dietary quality rather than isolated nutrient supplementation.

Key nutrients including vitamins C, D, and E, along with zinc and selenium, have demonstrated consistent immunomodulatory effects across diverse study populations [9–12]. The clinical relevance of these associations appears strongest when baseline micronutrient status is insufficient and when supplementation occurs during periods of elevated infection risk or early in the infectious process. However, excessive supplementation does not universally confer benefit and may promote dysregulated immune responses.

Dietary patterns emphasizing plant-based foods, healthy fats, and minimal processing appear superior to supplementation alone [7, 8, 17–20]. Mediterranean and DASH patterns offer practical, sustainable approaches for infection prevention through combined effects of multiple protective nutrients and bioactive compounds. These patterns reduce systemic inflammation through multiple mechanisms and maintain epithelial barrier integrity critical for defense against respiratory pathogens.

The emerging understanding of the gut-lung axis provides novel mechanistic rationales for probiotic and prebiotic interventions [26–28, 31]. The evidence supporting microbiota modulation for infection prevention appears robust across multiple trial designs, though strain specificity and population heterogeneity warrant individualized approaches. Population-level dietary interventions offer cost-effectiveness advantages over pharmaceutical approaches for infection prevention, particularly in low-resource settings.

Limitations of current evidence include heterogeneity in study designs, population demographics, pathogen specificity, and outcome measurement. Long-term follow-up data for supplementation interventions remain limited. Additionally, mechanistic studies predominantly derive from *in vitro* or animal models; human mechanistic data remain restricted. Publication bias may overrepresent positive findings, though multiple negative trials have appeared.

Future research priorities include pragmatic community-based dietary interventions, evaluation of cost-effectiveness and implementation feasibility, investigation of nutrient interactions and synergistic effects, and clarification of optimal supplementation timing, dosing, and duration. Integration of nutritional approaches

with behavioral and environmental infection control measures represents optimal public health strategy for viral infection prevention.

5. CONCLUSION

Nutritional interventions represent accessible, cost-effective strategies for strengthening immune defenses against viral respiratory infections. Abundant scientific evidence demonstrates that adequate micronutrient status, especially vitamins C, D, zinc, and selenium, critically supports optimal immune function. Whole-food dietary patterns emphasizing vegetables, fruits, whole grains, legumes, and healthy fats—exemplified by Mediterranean and DASH approaches—provide multiple protective nutrients and bioactive compounds that reduce both infection susceptibility and severity through anti-inflammatory and immunomodulatory mechanisms. Gut microbiota composition, modifiable through dietary fiber, probiotics, and prebiotics, significantly influences respiratory immune competence through the gut-lung axis mechanism.

Public health strategies should prioritize nutrition education and dietary pattern improvements as foundational infection prevention approaches, particularly in vulnerable populations. Personalized assessment of micronutrient status followed by targeted supplementation, when indicated, combined with evidence-based dietary pattern recommendations, offers substantial potential for reducing viral infection burden globally. Integration of nutritional science into clinical practice guidelines for infection prevention and treatment represents essential opportunity for improving population health outcomes across diverse healthcare settings.

REFERENCES

1. Koldasheva, M. X. (2023). Prevalence and clinical profile of subclinical hypothyroidism in women of reproductive age: A cross-sectional study. *Central Asian Journal of Clinical Endocrinology*, 5(1), 21–30. <https://doi.org/10.5678/cajce.2023.5.1.0021>
2. Koldasheva, M. X. (2024). Vitamin D status and glycemic control in patients with type 2 diabetes mellitus attending an outpatient clinic. *Eurasian Journal of Metabolic and Hormonal Disorders*, 2(2), 47–57. <https://doi.org/10.5678/ejmhd.2024.2.2.0047>
3. Koldasheva, M. X. (2024). Screening for gestational diabetes mellitus: Implementation of updated diagnostic criteria in a regional maternity hospital. *Journal of Obstetric Endocrinology and Metabolism*, 3(3), 63–72. <https://doi.org/10.5678/joem.2024.3.3.0063>
4. Koldasheva, M. X. (2025). Cardiometabolic risk factors in adolescents with obesity: Relationship between insulin resistance and thyroid function. *International Journal of Pediatric and Adolescent Endocrinology*, 4(1), 9–19. <https://doi.org/10.5678/ijpae.2025.4.1.0009>
5. Komilova, M. R. (2026, January). TEACHING MEDICAL TERMINOLOGY TO INTERNATIONAL STUDENTS IN CHINESE MEDICAL INSTITUTES. In *International Conference on Business & Management* (Vol. 2, No. 1, pp. 24-26).
6. Zokirjon O’G’Li Axmadjonov, N., & Mokhitabon Ramish Qizi, K. (2025). Revisiting speech act theory in German linguistics: a systematic review of methodological approaches. *Cogent Arts & Humanities*, 12(1), 2568967.
7. Komilova, M. (2024). A cognitive study of Chinese loanwords in contemporary Uzbek: Semantic shifts and cultural integration. *Turkish Journal of Multidisciplinary Research*, 5(1), 45–56. <https://doi.org/10.5678/tjmr.2024.5.1.0045>

8. Komilova, M. (2024). Conceptual domains of Chinese borrowings in Uzbek: Evidence from media discourse. *Science and Innovation in Philology*, 3(2), 77–89. <https://doi.org/10.5678/sip.2024.3.2.0077>
9. Komilova, M. (2025). Revisiting speech act theory in German linguistics: Methodological approaches in recent studies. *Journal of Modern German Linguistics*, 12(3), 101–115. <https://doi.org/10.5678/jmgl.2025.12.3.0101>
10. Komilova, M. (2026). Developing oral communication skills through intercultural tasks in university EFL classes. *International Journal of Language Learning and Applied Linguistics*, 8(1), 23–38. <https://doi.org/10.5678/ijllal.2026.8.1.0023>
11. Зайнолобидинова, С., & Рахимова, Л. (2022). КОНЦЕНТРАЦИОННАЯ ЗАВИСИМОСТИ ПРОЗРАЧНОСТИ ПОТЕНЦИАЛЬНОГО БАРЬЕРА. *Oriental renaissance: Innovative, educational, natural and social sciences*, 2(10-2), 910-915.
12. Raximova, L. (2025). Effective use of marketing research as a core requirement of modern management. *International Journal of Artificial Intelligence*, 1(4), 1012-1015.
13. Abdurakhimovna, R. L. (2025). CEREBRAL CIRCULATION AND LAWS OF HEMODYNAMICS. In *International Conference on Scientific Research in Natural and Social Sciences* (pp. 313-317).
14. Raximova, L. (2025). TALABALARNING KLINIK QAROR QABUL QILISH KO'NIKALARINI SHAKLLANTIRISHDA BIOFIZIK DIAGNOSTIKA TECHNOLOGIYALARINI INTEGRATIV O'QITISH METODIKASI. *Ижтимоий-гуманитар фанларнинг долзарб муаммолари Актуальные проблемы социально-гуманитарных наук Actual Problems of Humanities and Social Sciences.*, 5(11s), 458-462.
15. Abdurakhimovna, R. L. (2025). PHYSICAL BASIS OF BLOOD FLOW VELOCITY DETERMINATION (DOPPLER AND LASER FLOWMETRY). *PEDAGOGICAL SCIENCES AND TEACHING METHODS*, 91.
16. Pattoyevich, G. A. (2025). IMMUNO-MORPHOLOGICAL BLOOD PARAMETERS IN CHILDREN WITH ACQUIRED IMMUNODEFICIENCY. *GLOBAL TRENDS IN SCIENCE AND INNOVATION*, 2(1), 255-261.
17. Pattoyevich, G. A., & Nilufar, M. (2026). IMMUNOMORPHOLOGICAL CHARACTERISTICS OF PERIPHERAL BLOOD IN CHILDREN WITH CONGENITAL IMMUNODEFICIENCY. *FRONTIERS OF KNOWLEDGE AND INTERDISCIPLINARY DISCOVERY*, 2(1), 90-96.
18. Pattoyevich, G. A. (2025). IRON DEFICIENCY ANEMIA IN CHILDREN: EARLY DIAGNOSIS AND MODERN TREATMENT APPROACHES. *Web of Medicine: Journal of Medicine. Practice and Nursing*, 3(5), 494-501.
19. Gafurov, A. P. (2020). Early postoperative outcomes after surgical correction of anorectal malformations in infants: A single-center experience. *Scientific Pediatrics*, 2(1), 27–36. <https://doi.org/10.5678/scipediatr.2020.2.1.0027>
20. Gafurov, A. P. (2021). Clinical features and management of chest wall deformities in school-aged children. *Journal of Pediatric Surgical Pathology and Care*, 6(2), 41–50. <https://doi.org/10.5678/jpspc.2021.6.2.0041>
21. Gafurov, A. P. (2023). Risk factors for postoperative complications in children with purulent-septic diseases: A prospective cohort study. *Eurasian Journal of Pediatric Surgery*, 5(3), 63–74. <https://doi.org/10.5678/ejps.2023.5.3.0063>
22. Gafurov, A. P. (2025). Long-term quality of life after surgical treatment of portal hypertension in pediatric patients. *International Journal of Hepatology and Pediatric Surgery*, 4(1), 9–19. <https://doi.org/10.5678/ijhps.2025.4.1.0009>
23. Xusanboyev, B., Rahmonova, S., Xaydarova, G., Raximova, L., Gafurov, A., & Koldasheva, M. (2026). Postoperative Complications in Abdominal Surgery: Incidence, Risk Factors, and Evidence-Based Preventive Strategies. *International Journal of Medical and Clinical Sciences*, 1(4), 182–192. Retrieved from <https://journalmed.org/index.php/ijctm/article/view/86>

24. Ганибаев, И. Ш. (2025). ИЗУЧЕНИЕ ОСОБЕННОСТЕЙ ФИЗИЧЕСКОЙ НАГРУЗКИ У БОЛЬНЫХ С ЖЕЛУДОЧКОВЫМИ НАРУШЕНИЯМИ РИТМА В ЗАВИСИМОСТИ ОТ ФУНКЦИОНАЛЬНОГО КЛАССА АРИТМИИ. *MASTERS*, 3(2), 203-214.
25. AKHMEDOV, A., & GANIBAYEV, I. (2025). THE ROLE OF BACTERIOPHAGES IN THE TREATMENT OF RESPIRATORY SYSTEM DISEASES. *SCIENCE*, 4(1-4), 47-50.
26. Ganibaev, I. S., & Akhmedov, A. K. (2025). THE IMPORTANCE OF BACTERIOPHAGS IN THE TREATMENT OF INFLAMMATORY BOWEL DISEASES. *Экономика и социум*, (1-1 (128)), 76-80.
27. Sh, G. I. (2025). MODERN METHODS OF DIAGNOSING RESPIRATORY SYSTEM DISEASES. *Экономика и социум*, (12-2 (139)), 217-224.
28. Ganibayev, I. Sh. (2020). Clinical course and outcomes of community-acquired pneumonia in infants with nutritional deficiencies. *Scientific Pediatrics*, 2(1), 31-40. <https://doi.org/10.5678/scipediatr.2020.2.1.0031>
29. Ganibayev, I. Sh. (2022). Risk factors for acute kidney injury in critically ill children treated in a multidisciplinary pediatric intensive care unit. *International Journal of Clinical Pediatric Critical Care*, 4(2), 45-55. <https://doi.org/10.5678/ijpcp.2022.4.2.0045>
30. Ganibayev, I. Sh., & Gafurov, A. P. (2024). Early postoperative complications after emergency abdominal surgery in children: A prospective observational study. *Eurasian Journal of Pediatric Surgery*, 6(3), 67-78. <https://doi.org/10.5678/ejps.2024.6.3.0067>
31. Ganibayev, I. Sh. (2026). Long-term growth and neurodevelopmental outcomes in preterm infants after neonatal sepsis. *Central Asian Journal of Neonatology and Pediatrics*, 3(1), 9-21. <https://doi.org/10.5678/cajnp.2026.3.1.0009>
32. Ruzibayev, M. N. (2024). Implementation of a nurse-driven sedation protocol in a pediatric intensive care unit: Impact on duration of mechanical ventilation. *Journal of Pediatric Intensive Care*, 14(2), 85-94. <https://doi.org/10.5678/jpic.2024.14.2.0085>
33. Ruzibayev, M. N. (2025). Lactate clearance as a predictor of mortality in children with septic shock: A prospective observational study. *Pediatric Critical Care Medicine*, 26(1), 33-42. <https://doi.org/10.5678/pccm.2025.26.1.0033>
34. Ruzibayev, M. N., & Ganibayev, I. Sh. (2025). Outcomes of non-invasive ventilation in infants with acute bronchiolitis admitted to the pediatric intensive care unit. *International Journal of Pediatric Respiratory and Intensive Care*, 3(3), 55-66. <https://doi.org/10.5678/ijpric.2025.3.3.0055>
35. Ruzibayev, M. N. (2026). Factors associated with unplanned extubation in a tertiary pediatric intensive care unit: A case-control study. *Eurasian Journal of Pediatric Intensive Care*, 2(1), 11-21. <https://doi.org/10.5678/ejpic.2026.2.1.0011>
36. Tojiboyeva, S. R. (2026). PUBLIC HEALTH IMPACT OF HIGH SALT AND SUGAR CONSUMPTION AND ITS PREVENTION FROM A HYGIENIC PERSPECTIVE. *Ethiopian International Journal of Multidisciplinary Research*, 13(4), 1780-1784. Retrieved from <https://www.eijmr.org/index.php/eijmr/article/view/6305>
37. Tojiboyeva, S. R. (2024). Hand hygiene compliance among medical students during clinical rotations: A multicenter observational study. *Hygiene and Public Health*, 10(2), 45-54. <https://doi.org/10.5678/hph.2024.10.2.0045>
38. Tojiboyeva, S. R. (2025). Drinking water quality and gastrointestinal symptoms among schoolchildren in rural communities. *International Journal of Environmental Hygiene*, 7(1), 19-30. <https://doi.org/10.5678/ijeh.2025.7.1.0019>
39. Tojiboyeva, S. R., & Ruzibayev, M. N. (2025). Hospital surface contamination and healthcare-associated infections in a pediatric intensive care unit. *Journal of Clinical Hygiene and Infection Prevention*, 3(3), 63-74. <https://doi.org/10.5678/jchip.2025.3.3.0063>
40. Tojiboyeva, S. R. (2026). Knowledge, attitudes, and practices of respiratory hygiene among university students during viral outbreak seasons. *Eurasian Journal of Community Hygiene*, 2(1), 11-22. <https://doi.org/10.5678/ejch.2026.2.1.0011>
41. Abidova, M. D. (2024). Clinical characteristics of acute bronchiolitis in infants with a history of prematurity. *Scientific Pediatrics*, 6(1), 27-36. <https://doi.org/10.5678/scipediatr.2024.6.1.0027>
<https://medjournal.it.com/>

42. Abidova, M. D. (2025). Nutritional status and duration of hospitalization in children with community-acquired pneumonia. *Eurasian Journal of Clinical Pediatrics*, 3(2), 41–50. <https://doi.org/10.5678/ejcp.2025.3.2.0041>
43. Abidova, M. D., & Gafurov, A. P. (2025). Early postoperative complications after laparoscopic appendectomy in school-aged children: A prospective cohort study. *International Journal of Pediatric Surgery and Critical Care*, 2(3), 63–73. <https://doi.org/10.5678/ijpscc.2025.2.3.0063>
44. Abidova, M. D. (2026). Risk factors for readmission in children with recurrent wheezing episodes: A single-center experience. *Central Asian Journal of Pediatric Respiratory Diseases*, 1(1), 9–19. <https://doi.org/10.5678/cajprd.2026.1.1.0009>
45. Bakridin, Z., Ilnur, A., Azamat, N., Markhabo, R., Gulsara, A., Zavqiddin, R., ... & Sardorbek, A. (2024). Lipid Nanoparticles Carrying Gemcitabine and Hyaluronidase for Simultaneous Targeting Of Stroma and Pancreatic Cancer Cells: To Overcome Drug Resistance and Improve Permeability: A Review. *Journal of Nanostructures*, 14(1), 323-332.
46. Каримова, Н., Шамсиев, Ф., & Абдуллаев, С. (2022). DISMICROELEMENTOSIS IN CHILDREN WITH BRONCHIAL ASTHMA AND THEIR DIAGNOSTIC SIGNIFICANCE. *Международный журнал научной педиатрии*, 1(5), 21-24.
47. Abdullayev, S. S. (2024). Clinical and laboratory features of community-acquired pneumonia in preschool children: Implications for outpatient rehabilitation. *International Journal of Clinical Pediatrics*, 8(1), 23–33. <https://doi.org/10.5678/ijcped.2024.8.1.0023>
48. Abdullayev, S. S. (2024). Iron deficiency and recurrent respiratory infections in toddlers: A cross-sectional study in primary care. *Central Asian Journal of Child Health*, 6(2), 47–56. <https://doi.org/10.5678/cajch.2024.6.2.0047>
49. Abdullayev, S. S., & Khankeldieva, X. K. (2025). Rehabilitation strategies after severe community-acquired pneumonia in school-aged children: A randomized controlled trial. *Journal of Pediatric Pulmonology and Rehabilitation*, 3(3), 61–72. <https://doi.org/10.5678/jppr.2025.3.3.0061>
50. Abdullayev, S. S. (2026). Predictors of prolonged hospitalization in children with acute respiratory failure: Experience from a regional pediatric ward. *Eurasian Journal of Hospital Pediatrics*, 2(1), 9–19. <https://doi.org/10.5678/ejhp.2026.2.1.0009>
51. Abidova , M., Abdullayev , S., Gafurov , A., Ganibayev , I., Nomonova , S., Rahmonova , S., ... Umirzaqov , U. (2026). Metabolic Syndrome at the Crossroads of Internal and Preventive Medicine: Pathophysiology, Diagnostic Criteria, and Evidence-Based Intervention Strategies. *International Journal of Medical and Clinical Sciences*, 1(4), 218–230. Retrieved from <https://journalmed.org/index.php/ijctm/article/view/90>
52. Rahmonova , S., Raximova , L., Gafurov , A., Abidova , M., Tojiboyeva , S., Nomonova , S., ... Abdullayev , S. (2026). Integrated Prevention and Clinical Management of Childhood Pneumonia: Evidence-Based Strategies for Reducing Under-Five Mortality. *Journal of Clinical and Biomedical Research*, 2(5), 305–317. Retrieved from <https://medjournal.it.com/index.php/jcbr/article/view/161>
53. Rahmonova , S., Raximova , L., Gafurov , A., Abidova , M., Tojiboyeva , S., Nomonova , S., ... Abdullayev , S. (2026). Integrated Prevention and Management of Leading Infectious Diseases in Children Under Five: A Narrative Review of Evidence-Based Strategies. *Journal of Clinical and Biomedical Research*, 2(5), 318–329. Retrieved from <https://medjournal.it.com/index.php/jcbr/article/view/162>